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Using movement and kinesthetic learning to teach academics in a fourth grade classroom

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USING MOVEMENT AND KINESTHETIC LEARNING TO TEACH ACADEMICS IN A FOURTH GRADE CLASSROOM

by
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ABSTRACT

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Dr. Marjorie Madden
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The purpose of this research study was to determine what happens when movement and kinesthetic learning are implemented academically in a fourth-grade regular education classroom. Kinesthetics were used to help teach a social studies unit on Europeans in New Jersey and were later infused into the classroom curriculum. Qualitative inquiry strategies such as video-taped lessons, student written feedback, individual interviews, and observations written in my own teacher research journal were used to collect data. Sorting and categorizing data within and between data sources revealed that the kinesthetic learning lead to increased understanding of the topics being studied, heightened student engagement, and fostered positive collaborative experiences among the students. Implications for teaching academic content using kinesthetic learning are discussed.

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CHAPTER I

Scope of the Study

Introduction

"Boys and girls, boys and girls, it is time to start our science lesson for the day!" I exclaimed during my senior year practicum in the spring of 2008. My co-teaching partner and I were about to begin teaching a lesson on waves during our *Commotion in the Ocean* unit to a group of bright-eyed and eager to learn first graders. With the sounds of shuffling feet and screeching chairs on the tiled floor, we waited for our students to be ready. I was excited to teach this lesson because of my particular fondness for the ocean and for children who enjoy listening to me talk.

The purpose of this lesson was to teach the children the difference between high tide and low tide. By showing them pictures of small waves floating serenely near a lighthouse and others containing surfers riding large barrel waves, the students began to get excited about tides; they were still, though, not completely sure of the differences between the two. "I'm still kinda confused Miss F," stated one hard working student with eyes the size of Texas. I told her to pay attention to find out more. We then proceeded to discuss the differences between high and low tide by using a moveable diagram on the board. The diagram contained both the land and an ocean that moved to simulate the moving of the tides. We explained how, during high tide, the waves get bigger, the water becomes deeper, and the water moves further up the land. The students learned that, during low tide, the waves get smaller, the water becomes less deep, and the ocean water

moves away from the land.

I felt completely in my element teaching this lesson, but something was missing. The advanced students were able to answer questions about the content of the lesson, but others seemed to be left behind, looking at me as though I had no head. While some students sat up straight and intently gazed at the blackboard filled with pictures and words, others chose to let their eyes wander and their hands play with objects located in their desks. "Jordan are waves big or small at high tide?" I inquired. She stared at me with a blank face. It was a face that I never wanted to see as a pre-service teacher.

Although the majority of the students comprehended the lesson thus far, it was not enough for me. I knew that I could make more students, even those classified as learning disabled, understand the difference between the two types of tides. "Hey do you think I could try something really quick?" I quietly asked my partner. She replied with a supportive, "yeah, sure" and let me conduct a mini-activity that I thought might help.

Thinking on my feet, I asked the children to stand up, to form a straight line facing the blackboard, and to hold hands with their neighbors. After the initial squealing, everyone was linked. I then began to show the students how we could use our bodies to help us learn about high and low tide. "You are going to be the ocean waves and the blackboard is going to be the land," I stated. For high tide, we moved our arms up and down in a wave-like motion to represent large waves and we took large steps towards the blackboard to simulate the tide moving further up the land. For low tide, we moved out arms in very small and calm wave-like motions and walked a few steps towards the back of the room to embody the ocean water moving away from the land. The children were enthralled! Being allowed to be silly *and* learn educational content really seemed to

appeal to this wonderful group of children. One child, who initially had difficulty with the lesson, excitedly came up to me and said, "I get it! I get it!" Even later on, when the students were completing a worksheet on the lesson, I watched as their little hands and arms moved up and down, knowing that they were using these movements to stimulate their memory.

When reflecting on this lesson, I remember being excited about what was done in the classroom and was particularly proud of my tide movement activity. Unfortunately, though, I did not attempt to use movement in any of my other lessons that semester; I guess I did not know how. The movement aspect of this tide lesson was added last minute and, although it was successful, I have not thought about using movement to teach academics until now. Flipping through the pages of this old lesson plan has helped to spark my imagination.

Purpose Statement

Using movement in the classroom is not something that is required of teachers; it is not something that is tested on state standardized tests. It is, though, a way of teaching that can help increase children's academic potential. It is a common notion that "what we do with our bodies is somehow less privileged, less special, than those problem-solving routines carried out chiefly through the use of language, logic, or some other relatively abstract symbolic system (Gardner, 1993, p. 208). Teachers often prefer to solely use linguistic and mathematical-reasoning type lessons that only cater to a specific group of children. What about the children who learn better through hands-on activities or the students who need motivating lessons to stay engaged?

Movement is a very powerful tool that is easily accessible to all teachers and has

shown to be very successful in helping to teach academics. Research has shown that students who are engaged in movement activities, show superior academic skills and have a more positive attitude towards school (Pollatscheck & Hagen, 1996). It also helps support the development of the entire child by allowing them to release pent-up energy that builds throughout the day from constantly being made to sit in a desk chair (Tortora, 2006). In addition, much research has been done to help educators understand the connections between movement, the brain, and the body. It turns out that movement has the ability to strengthen the connections between our neurons (Greenfield, 2008). In fact, the cerebellum, which plays a major role in our motor control, also processes such things as memory and attention (Jensen, 1998). It is no small coincidence that the same part of the brain that processes movement also processes learning. Movement also leads to increased blood and oxygen flow which ultimately leads to greater learning (Peebles, 2007).

Another positive effect of using movement in the classroom is that it can act as a motivator for students who are uninterested in school. A kinesthetic curriculum has shown to help students, even those with disabilities, make connections between the content of the lesson and the world around them, which ultimately leads to increased motivation (Westerhold, 1998). When students are motivated, they are more likely to pay attention and retain the information taught. Movement is also a form of implicit learning, which is defined as "the acquisition of knowledge that takes places primarily outside of our conscious awareness," and is often taught through simulations, theater projects, field trips, role play, complex games, model-making, life experiences, and of course movement (Jensen, 2000, p.1). Teachers often overlook this type of learning, preferring

to teach more explicitly through the use of lectures, textbooks, worksheets, and research projects. Implicit teaching, though, is not only more motivating, but is considered to be a more specific type of learning. This means that a person can absorb more information per day through this type of learning (Dienes & Berry, 1997). This information alone should be enough to encourage teachers to incorporate movement into their classroom curriculum. Movement, though, should not overtake academics, but it can most certainly be incorporated throughout lessons to increase learning.

Based on my extensive research, I have noticed that a great deal of information can be found on using movement to teach physical education concepts, but not as much on using it in the classroom. This particular study will therefore focus on the use of movement and kinesthetic learning to teach academic subjects in a fourth grade elementary classroom. Participants will have the opportunity to learn content not only through the traditional modes of learning, but also through the use of kinesthetics. Through different types of activities, the students will be able express themselves and hopefully become more motivated learners. After completing a variety of movement lessons, the students will be encouraged to reflect on their learning and on the overall effectiveness of using movement in the classroom. It will be important to gain their insight for future use.

This topic is particularly important and can contribute to the field of education because kinesthetics is a unique and often forgotten form of teaching that holds great benefits for many learners. This study will add to the limited amount of research done on implementing movement activities into the classroom to teach different subject areas, particularly social studies. It will hopefully inspire other teachers to look at what they can

do to modify their curriculum to incorporate this engaging mode of learning into their daily routines.

Statement of Research Problem and Question

With the recent emphasis on standardized test taking in today's educational world, teachers often get stuck using practice books, worksheets, and lectures to cram as much information as possible into the heads of their students. By doing so, they are only meeting the needs of a certain number of children, particularly linguistic and mathematical learners. Often, many below-level learners do not feel comfortable with these types of teaching styles. As a result, teachers should provide students with activities that not only facilitate learning, but that also create opportunities for active engagement.

Based on this research problem, my question becomes, *How can the use of movement and kinesthetic learning be implemented academically in a fourth grade elementary classroom?* Sub questions based upon this research question are: *What is the most effective way to use movement with students?* and *How can movement enhance student motivation?*

Story of the Question

In the fall of 2006, I became the Vice President for the Student Council for Exceptional Children (SCEC) at Rowan University. This is essentially a special education club for undergraduate students who wish to interact and learn more about students with disabilities. Through my involvement in the club, I met many people who I have become close with and whom I deeply respect. At one particular meeting, I remember seeing an unfamiliar professor sitting in the back of the room taking notes. While I was happy to see that another professor had taken an interest in a club that I felt so passionate about, I

was unsure as to why she had decided to attend. "Elise this is Dr. Cone, she is a professor in the Health and Exercise Science Department and teaches the class on adapted physical education," stated my club advisor after the meeting had adjourned. I politely introduced myself and told her that I was happy that she was able to come to our meeting. At the same time, though, I was thinking, *what is adapted physical education?* I did not want to be rude, so instead pretended to know why she was so interested in our small club.

When I got back to my apartment, I decided to "google" adapted P.E. and, to my delight, discovered that it was a sub-discipline of physical education for students with disabilities. "Ohhh," I said out loud, feeling somewhat of a fool for not putting two-and-two together. After looking through numerous websites, I began to get an idea of what it meant to conduct an adapted physical education program. It seemed like an exciting field and the other officers and I were happy to have her join SCEC as an advisor.

For one of our meetings, we asked Dr. Cone to give a presentation to our members concerning the use of movement in both the special and general education classrooms. Through the use of music, props, and our own bodies, Dr. Cone taught us how to engage all students in their learning. Some of the activities were used in a pure physical education sense, but others dealt with how educators can incorporate movement into their lesson plans. After leaving the meeting, I immediately called my mom. "Ma, Dr. Cone did the coolest things in SCEC tonight!" I exclaimed. It was obvious that I was highly impressed by her presentation, but as the year went on and my undergraduate education came to a close, I had not had the time to take a closer look at this teaching method.

When I entered my Analysis and Applied Research class for the first time, I immediately felt my blood pressure rise and my stomach churn at the thought of having to write a thesis. *What should my topic be?* I asked myself a thousand times, wanting to think of something that would not only interest me, but would be something practical and engaging that I could use in my future classroom. I did not want to randomly pick a topic because I knew it would be "easy" and I did not want to choose something that I was not truly passionate about. I asked everyone I knew in the education field for advice, but my mind remained blank. While my classmates began deciding their theses topics, I felt the pressure to discover mine; unfortunately, though, I began arbitrarily choosing topic ideas, rather than actually *discovering* what would suit me best.

After watching my cooperating teacher in my Clinical I internship talk to her students in a very real manner about her own life experiences, I became interested in looking at what happens when morning meetings are implemented in an elementary classroom. I did some initial research on class meetings and luckily found a lot of information on the topic; I was excited by the thought of having authentic conversations with my students about their lives and concerns. As I more deeply thought about morning meetings, though, I began to realize that they might not be easy to incorporate into an already established classroom half way through the year. I also realized that I was not passionate about class meetings, but was rather trying to pick a topic for the sake of picking a topic.

One night, as I was sitting in my room racking my brain for ideas, I fell upon some old papers I had once looked at after Dr. Cone's presentation. My mind started turning and I thought, *Hey maybe I could do this, but is it practical?* I always thought

kinesthetic learning was interesting, but I never thought that it could be truly implemented in a classroom; it seemed like something only dance and gym teachers could employ. *Would using movement in the classroom be beneficial to my students?* I wondered. Before getting too excited, I made an appointment with Dr. Cone to discuss using movement to specifically teach academics. I wanted to try something new, something that could be adapted to meet the needs of all students. After leaving her office, I immediately knew that this is what I wanted to research and eventually implement in a classroom. I realized that this is what I had been searching for the entire time: something that was unique, engaging, and practical. I finally found a teaching method that had the potential to not only force my students to become active learners, but would also force me to think out-of-the-box. When I teach I do not want to get stuck in the hum-drum of using worksheets and practice book pages. Rather, I want my classroom to be a place where my students are interacting with the content of the lessons or performing tasks that can be generalized to the real world. I want their learning experiences to be memorable and I truly feel that using movement in the classroom is one of the ways in which this goal can hopefully be accomplished.

Limitations of the Study

Originally this research study was meant to be conducted in a special education self-contained classroom in order to help me understand what happens when movement is used to teach students with more severe disabilities. My initial plans needed to be re-worked when I was placed in a fourth grade general education classroom with only one student classified as having a Specific Learning Disability. Although I wanted to see how kinesthetics could benefit students who had greater difficulty learning through traditional

modes of teaching, I soon found that my research plan could be easily adapted to the general education setting due to the fact that all of the students were at very different levels. It is just as exciting to see the effects of movement-based learning in this type of classroom.

Organization of the Thesis

Chapter Two takes a more in-depth look at the related research on the use of movement in the classroom. Topics discussed include the theory of multiple intelligences with a focus on kinesthetic learning, the importance of movement in the classroom, the impact of movement on the body and brain, movement as a means of motivation and a form of implicit learning, and strategies for the implementation of movement in both the language arts and mathematics classrooms. Chapter Three discusses the context of the study and describes the research methodology. Chapter Four and Five discuss the results of this study and its implications for further research.

CHAPTER II

Review of the Literature

Introduction

The use of movement in the classroom is an often overlooked mode of learning. Chapter two presents a review of the literature regarding movement to teach academics primarily in elementary school classrooms. The first section discusses the theory of multiple intelligences, particularly on the importance of fostering bodily-kinesthetic learning. The second section focuses on the importance of using movement in the classroom and the benefits it has for student's brains and bodies, for creating motivated learners, and for helping students retain information as a type of implicit learning. Section three provides ways in which movement can be implemented in both the language arts and mathematics classrooms. The chapter concludes with a discussion on why teachers need to add movement to their curriculums and how this particular study will hopefully shed more light on how movement can be used in an elementary classroom.

The Theory of Multiple Intelligences

"Knowing in part may make a fine tale, but wisdom comes from seeing the whole."

Seven Blind Mice by Ed Young

When teaching, most educators come across a variety of students who seem to have different needs and abilities; some may learn better through writing, while others are more skilled in solving math related problems. On the same note, one student may be

extremely musical, but lack basic social skills. Prominent theorist Howard Gardner came up with a theory to help explain the different strengths and weaknesses that different students display both in the classroom and throughout their lives. His theory of multiple intelligences maintains that there are many different types of "intelligences" that people can exhibit and that it important for teachers to take all of them into consideration when educating children (Gardner, 1993). These intelligences include:

- Linguistic: the ability to understand and use written communication
- Logical-mathematical: the ability to use logic and numerical symbols
- Musical: the ability to use and understand musical concepts such as rhythm, pitch, and harmony
- Spatial: the ability to orient and manipulate 3D space
- Bodily-kinesthetic: the ability to coordinate physical movement
- Naturalistic: the ability to categorize objects in nature
- Intrapersonal: the ability to understand one's thoughts
- Interpersonal: the ability to interact well with others
- Existential: the ability to contemplate and question the phenomena's in the world (Gardner, Kornhaber, & Moran, 2006)

Every child has some combination of strengths and weaknesses regarding these different types of intelligences; in fact, intelligences are never isolated. For instance, a professional dancer uses musical, spatial, and bodily-kinesthetic intelligences, while a journalist uses linguistic and interpersonal (Gardner et al., 2006). Similarly, all students have a combination of intellectual abilities; for example, there are many exceptional autistic children who completely lack interpersonal skills, yet their kinesthetic sense is

highly developed (Gardner, 1993). Thus, it is important for educators to identify their students' individual strengths and offer them rich experiences in which they engage in a variety of activities to learn and comprehend a concept.

It is important to note that Gardner created this theory because he felt it would be better to "describe an individual's cognitive abilities in terms of relatively independent but interacting cognitive capabilities rather than in terms of a single 'general' intelligence" (Gardner et al., 2006, p. 23). In other words, students should not be classified as either being smart or dumb, but rather should be assessed according to their individual strengths. There is not one specific way to be *smart;* the definition of *smart* is different for each individual child! Therefore, if students are having difficulty, it is important for teachers to first ask themselves *why* they are having problems; it could be that the students are not being allowed to express themselves according to their particular strengths (Gardner et al., 2006). Although linguistic activities are often the main focus in both regular education and special education classrooms, teachers need to begin to "continuously seek opportunities to learn about, and implement, differentiated curriculum to impact student learning in as many ways as possible" (Westerhold, 1998, p. 17). This is not to say, though, that teachers should be creating nine different lesson plans for each type of learner; rather, the purpose of the theory is to "demonstrate that because students bring to the classroom diverse intellectual profiles, one 'IQ' measure is insufficient to evaluate, label, and plan education programs for all students" (Gardner et al., 2006, p. 23). These different types of intelligences can in fact be intertwined into one lesson. For instance, one 5th grade teacher at Searsport Elementary School in Searsport, Maine created an archeology unit in which the students researched local history (using linguistic

intelligence), conducted an archeological dig (spatial and bodily-kinesthetic), identified and classified objects found outdoors (naturalistic), and worked together to create a museum exhibit (interpersonal) (Gardner et al., 2006). Gardner's theory of multiple intelligences can not only help educators to better understand their children, but will hopefully inspire them to create lessons that assist students in succeeding according to their personal strengths.

Bodily-Kinesthetic Intelligence

> "Our kinesthetic sense... allows us to judge the timing, force, and extent of our movements and to make necessary adjustments in the wake of this information."
>
> (Gardner, 1993, p. 210)

In the average classroom, activities that foster and use bodily-kinesthetic intelligence are few and far between. In our culture, there is lack of connection between the activities of reasoning and the physical activities of our bodies (Gardner, 1993). It is a common notion that "what we do with our bodies is somehow less privileged, less special, than those problem-solving routines carried out chiefly through the use of language, logic, or some other relatively abstract symbolic system" (Gardner, 1993, p. 208). Contrary to this popular conception, kinesthetic learning, which again deals with the ability to coordinate physical movement, is one of the ways in which children can learn. Often, in classrooms that support its kinesthetic learners, children are able to use their bodies to help make better sense of a certain topic or to create a first-hand experience that can later be applied to the content of a lesson (Westerhold, 1998). For instance, at the Center for Creative Learning in the Rockwood School District located in St. Louis, Missouri, one of the main goals of its program is to "create opportunities for

children to practice and reflect upon knowledge and skills which will enable then to succeed in the gymnasium and beyond" (Westerhold, 1998, p, 16). At this school, kinesthetic learning is used in conjunction with academics. Because the staff is knowledgeable in Gardner's theory of multiple intelligences, the children learn, for instance, about lasers by simulating their movement with their bodies, they interact with a giant computer on the gymnasium floor, and they learn about architecture by building arches with their bodies (Westerhold, 1998). It is quite apparent that this school understands the importance of kinesthetic learning and authentic instruction.

Authentic instruction is the use of teaching techniques "which provide learning experiences as close to real life situations as possible. The student learns by performing, creating, or doing something" (Westerhold, 1998, p. 16). The use of authentic instruction and kinesthetic learning is greatly apparent at a preschool special education program in Staten Island called First Foot Forward. In one particular class, students range in age from 2½-years-old to 5½-years-old; the majority have moderate to severe speech and language disorders, yet there are also cases of emotional, cognitive, and fine motor difficulties (Merrefield, 1997). The teachers in this class decided to create a unit based on the popular children's fairy tale *The Three Billy Goats Gruff*. During this unit, students re-enacted the story with their classmates, took turns role playing the goats and trolls, learned the concept of over and under by crawling over and under balance beams (acting as the troll's bridge), and learned how to problem solve by creating papier-mâché trolls, goats, and bridges (Merrefield, 1997). From their own observations, the teachers concluded "that instruction in musical and bodily-kinesthetic activities best facilitated the development of language skills" (Merrefield, 1997, p. 61). Also, in Seattle, Washington,

3rd graders studied language arts concepts kinesthetically through the use of dance and movement. As a result, reading scores were increased by 13% in six months (Jensen, 1998). As shown by their reflections on their experiences, the teacher at all of these schools have truly shown their appreciation not only for Gardner's theory, but specifically towards the use of kinesthetic learning. These case studies show how powerful movement in academics can be, despite some negative notions concerning this type of teaching.

The Importance of Using Movement in the Classroom

"After all the arguments have been made for one side or the other, it gets down to one thing: Movement is about living and living is about learning."

(Eric Jensen, 2000, p. i)

Learning through movement is defined as "active, physical involvement of students as they create, develop, express, and learn first-hand about content" (Lancaster & Rikard, 2002, p. 29). It is a style of teaching that is not often used in the classroom, but is a way of learning that we have all used since we were infants. For instance, babies learn the concept of near and far by crawling around different areas of their home and learn about height when they try to climb up a chair (T. Cone, personal communication, October 22, 2008). With the recent emphasis on high stakes testing and the implementation of the No Child Left Behind Act in 2001, teachers have the tendency to focus less on developmentally appropriate curriculum and more on getting their children to pass the required examinations (Tortora, 2006). Although it is important for students to learn the concepts that they will need to pass these tests, it is just as important that students retain this information through different types of teaching that are appropriate

for their age. Using movement in the classroom is just one of the many ways in which teachers can actively engage their students in a lesson. Although movement is often emphasized on sports teams, in dance schools, and in gym class, there is no reason why classrooms cannot be a place where movement is fostered and used to teach academic subjects. In fact, it should be encouraged! Research has shown that children who are engaged in daily movement activities "show superior motor fitness, academic performance, and attitude towards school (Pollatscheck & Hagen, 1996, p. 2). This alone is a reason why teachers should be encouraged to incorporate movement into their daily lessons. If students had a more positive outlook on school, wouldn't their behaviors and academic work improve? In fact, according to Dr. Donald Kirkendall whose works are featured in *The American Journal of Sports Medicine*, physical activity is "essential in promoting normal growth of mental function," which, in turn, can help students enhance their academic potential (Pollatscheck & Hagen, 1996, p. 2).

Not only can the use of movement facilitate academic success, but it can also aid in decreasing inappropriate behaviors. Movement supports the development of the entire child, enables them to release built-up energy, and helps in creating smooth transitions from one lesson to the next (Tortora, 2006). In fact, *energizers* are particularly helpful when students begin to get restless. An energizer is a quick 5-minute activity that a teacher conducts to give his/her students a break from work so that they will be better able to focus when the lesson resumes (T. Cone, personal communication, October 22, 2008). Examples of this include doing simple stretches, going for a five minute walk, or putting on music and dancing.

Research has also shown that the use of movement in the classroom can assist

students who have sensory integration difficulties; these children often have problems registering and processing information, especially when a large amount of information is presented at one time (Jensen, 2000). This can lead to severe behavioral problems or self-stimulation behaviors, such as rocking back and forth, that can completely disrupt a classroom. The integration of movement, though, is one of the ways in which teachers can help these students process the information being presented to them. In fact, movement therapy is often used to treat everything from autism to learning disabilities to attentional deficits to sensory-motor problems (Jensen, 2000). For example, Glen Doman, founder of the Institutes for The Achievement of Human Potential, did work with autistic students and brain-damaged children by using intense sensory integration therapy. He found that teachers who used movement and interactive play in the classroom, produced students who found learning to be easier (Jensen, 1998).

Movement also has the ability to change students' moods and can give them the opportunity to express themselves emotionally. It is no surprise then that "exercise is the best overall mood regulator" (Thayer, 1996, p. 26). Students can use movement to act out how they are feeling when they enter the classroom each morning or, after doing a movement exercise in math class, students may begin to feel better about their day. When students are in a good mood, teaching is more easily implemented and content is more easily understood.

It must be noted, though, that movement in the classroom should not over-take academics and teachers should not lose focus of the content standards that need to be met (T. Cone, personal communication, October 22, 2008). Rather, movement needs to be integrated into the curriculum as a way to supplement and increase learning in the

different subject areas.

The Impact of Movement on the Body and Brain

Another reason why movement is important to incorporate into a classroom curriculum is that it positively affects student's bodies and minds, which in turn affects how they perform academically. Movement and exercise not only strengthen the muscles in the body, but also different parts of the brain such as the basal ganglia, cerebellum, and the corpus callosum (Jensen, 1998). The cerebellum is of particular importance because it plays a major role in motor control in sensory perception (Jensen, 1998). Peter Strick at the Veterans Affairs Medical Center of Syracuse, New York and his staff amazingly "traced a pathway from the cerebellum back to parts of the brain involved in memory, attention, and spatial perception" (Jensen, 1998, p. 84). It is no coincidence that the part of the brain that processes movement also processes learning! In addition, our thoughts and actions mold the strength of connections between neurons in the brain; these physical connections represent what we know (Greenfield, 2008). Therefore, "if you can maximize the strengths, and breadth, of connections associated with a particular concept, you increase the chance of making it stick" (Greenfield, 2008, p.36). This means that movement has the ability to reinforce the connections between neurons. Many teachers, though, only use words and visual representations to teach concepts in subject areas. Unfortunately, this type of learning only uses a fraction of neural networks in the brain (Greenfield, 2008). The motor systems, on the other hand, occupy a larger portion of our brain and "include some of the most evolutionarily advanced systems" (Greenfield, 2008, p. 36). By actively engaging the motor systems of the brain, the concepts of a lesson are more deeply represented.

There are also certain types of movements that can stimulate the brain's neurotransmitters, which are the body's natural motivators (Jensen, 2000). For instance, if an activity is compelling, adrenaline will be released and dopamine is produced if an activity involves repetitive gross-motor movements (Jensen, 2000). Therefore, the use of movement in the classroom helps to "increase energy levels, improve storage and retrieval of information, and helps learners feel good (Jensen, 2000, p. 29). This is supported by a study done at Scripps College in Claremont, California conducted on 124 subjects, half of whom were exercisers and half who were not. It was concluded that those who did at least 75 minutes of exercise a week "demonstrated quicker reactions, thought better, and remembered more" (Jensen, 1998, p. 86).

Movement is also beneficial to learners because it increases heat rate, circulation, and arousal, which helps improve attention skills. This in turn leads to increased academic performance (Tomporowski and Ellis, 1986). Also, increased aerobic activity leads to increased blood and oxygen flow to the brain, which again helps enhance students learning (Peebles, 2007). Sitting in a desk, without moving, for long periods of time can actually be detrimental to children's ability to learn. It can result in poor breathing, spinal column and lower back dysfunction, poor eye sight, and overall body fatigue (Jensen, 2000). To solve this, teachers truly need to engage students in more movement activities that incorporate the use of a variety of postures (Jensen, 2000). Walking, laying down, spinning, skipping, kneeling, squatting, and arching are just a few that can be incorporated into daily lessons. When movement is used, both the brains and bodies of children will be positively impacted to enhance their capacity to learn and to grow.

Movement as a Means of Motivation

Helping students become motivated is one of the key roles a classroom teacher needs to play. Without the drive to learn, students will have difficulty making it through the year. Students in special education classrooms unfortunately tend to be less motivated when compared to children in the regular education programs (Duhaney & Ewing, 1998). Sometimes, just knowing that they are on a lower level than their peers can negatively affect their motivation to learn. Struggling readers, who are often classified, also require extra effort by teachers to enhance their motivation. They need "repeated opportunities with effective instruction in order to begin demonstrating measurable improvements" and need help with generalizing these skills to new situations (Peebles, 2007, p. 580).

One effective way to increase student motivation is to incorporate movement into the classroom curriculum through such things as modeling, role playing, or even opportunities to exercise. It has been shown that "kinesthetic curriculum helps make cognitive connections real and puts undermotivated learners into motion" (Westerhold, 1998, p. 18). In fact, the prominent learning style of primary children and struggling readers is global, tactile, and kinesthetic (Carbo, 1997). These types of learners need more holistic methods and activities that allow them to move throughout the classroom to learn about specific curriculum content. Often, kinesthetic learners are labeled as "slow" because their auditory and linguistic intelligences are not as developed (Carbo, 1997). Teachers, though, should not view this learning style as being negative, but, rather, should embrace it and create files of kinesthetic activities to use with these children (Carbo, 1997).

In a study done on 53 third-, fourth-, and fifth-graders with learning disabilities on

their types of learning styles, it was discovered that the majority has strong preferences for reading through kinesthetic learning (Duhaney & Ewing, 1998). Also, in Charlotte, North Carolina, students with ADHD were provided movement opportunities not only to increase their motivation to learn, but also to help them remain alert (Carbo, 1997). One 2nd grader who often fell asleep was given a therapy ball to sit and bounce on while working at his desk (Carbo, 1997). This method proved to be successful in increasing both motivation and attention! While not all students are kinesthetic learners, these studies have shown that many students in both general and special education classrooms positively react to this type of learning. When a student is motivated, it is the hope of most teachers that this internal drive will lead to greater learning.

Movement as a Form of Implicit Learning

Implicit learning is defined as "the acquisition of knowledge that takes places primarily outside of our conscious awareness," and it just so happens that the use of movement is one of the ways in which this type of knowledge is acquired (Jensen, 2000, p.1). Unfortunately, though, children are more likely to be exposed to what is known as explicit learning. This type of learning employs the use of lectures, textbooks, research, discussion, and worksheets (Jensen, 2000). While this type of learning is of course needed in the classroom, teachers tend to overlook the benefits of implicit learning. In comparison to explicit learning, implicit learning makes use of simulations, theater projects, field trips, role play, complex games, model-making, life experiences, and movement (Jensen, 2000). This type of learning is not only more exciting than reading from a textbook or being told to fill out another worksheet, but it also has been shown to produce greater benefits. For instance, implicit learning asks students to organize their

responses from the explicit information they received in class, making it more valuable because it forces students to combine both types of learning (Jensen, 2000). Also, limited learning is transferred through explicit learning because it is often difficult to generalize this knowledge to the real world (Manza & Reber, 1992). For instance, knowing names, dates, and formulas does not really help children outside of a test. Because implicit learning requires children to move, create, or act out a situation, transfer occurs more frequently (Manza & Reber, 1992). It is also considered to be a more specific and robust type of learning; this means that a person can absorb more information per day through implicit learning (Dienes & Berry, 1997).

Movement is definitely a form of this type of learning. As evidenced, it something that all teachers should want to include in their curriculum due to the fact that it is much more lasting than explicit learning. For example, if teacher is working with students on reading fluency, he/she has the option to teach this concept either explicitly or implicitly. To teach it explicitly, the teacher would lecture the students on how to read fluently, model some examples from the language arts textbook, and then have the students practice reading sentences from their workbook. While there is nothing wrong with this type of teaching, doing it implicitly could have a more profound effect on the student's learning. For instance, a teacher might use a method known as Rhythm Walks. With this, the teacher puts the words of a sentence down on the floor in the correct order. The students then have to walk and read the sentence at the same time. By moving while talking, they would come to understand that reading is supposed to flow similarly to walking down the street (Peebles, 2007). The use of kinesthetic learning can truly benefit the development of children and can easily be combined with explicit learning to create

an experience that is lasting and easily generalized.

Using Movement in the Language Arts Classroom

As shown, movement is important not only in the physical education realm, but also in both the general and special education classroom. Classroom teachers need to look at themselves as movement educators in addition to their daily roles of teaching reading, math, social studies, and science. One of the areas in which movement can be uncharacteristically implemented is during language arts instruction. For instance, Reader's Theater involves reading and "rehearsing a passage, incorporating movements such as actions, gestures, and facial expressions, and presenting it to an audience with script in hand" (Peebles, 2007). In this activity, students will need to learn how to act out the emotions and thoughts of a character by inferring how they feel at certain points in a story. This method not only helps with reading fluency, but also with reading comprehension and public speaking skills. Rhythm Walks, as described earlier, is another effective way in which to teach fluency. Comprehension Process Motion is a strategy used to help young readers learn comprehension processes and "to develop their abilities to initiate them without teacher prompting" (Block, Parris, & Whiteley, 2008, p. 460). This method can be very effective for struggling readers who are often so focused on decoding the actual words, that they do not truly understand what it means to comprehend a story. They could spend countless hours just reading words and not understanding the whole purpose of a story. Comprehension Process Motion uses different hand signals to represent abstract comprehension strategies, such as finding the main idea, clarifying, making predictions, and inferring. The hand motions for clarifying and making predictions are shown below:

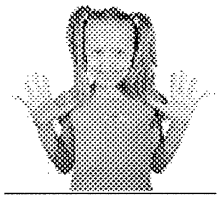

Figure 1:

Clarifying Hand

Signal

Use the **clarifying** signal anytime you have a question about something you are reading. First, place both hands together, then open them and splay the fingers. At first you mind is closed to meaning (put your hands together with thumbs touching in the center of your chest), then when your mind opens up to see a new meaning it completes a thinking process like this to end the process (move your hands to the splayed position) as shown in photo to the left" (Block, Parris, & Whiteley, 2008, p. 462).

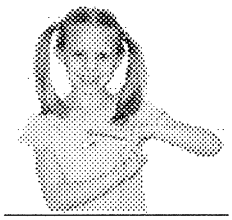

Figure 2:

Prediction Hand

Signal

"When you make a **prediction** based on the information the author has given you, your mind's eyes (put your forefinger and middle finger [the mind's eyes] on your right temple) must look beyond the obstacle, which is information you have not yet read (put your left hand horizontally in front of your eyes with the palm facing your eyes) to see what is likely to occur (move your right hand's fingertips beneath the left hand and in front of the left hand, facing toward the future, the ending position, as shown in the photo to the left). This is the process the mind follows each time it predicts" (Block, Parris, & Whiteley, 2008, p. 462).

This is a great example of how providing "concrete images in the form of hand movements will enhance young children's learning of other abstract concepts" (Block, Parris, & Whiteley, 2008, p. 460). This strategy could be easily modeled and used during guided reading or whole group read-alouds. Another method that could be utilized in a language arts classroom is to first have students identify movement words in a story; these are words that "provoke images that can be easily expressed through actions (Tortora, 2006, p. 409). To help understand these words, the students can create different movement to represent the word. For instance, in the sentence "The toast popped out of the toaster," children can physically represent what is happening to the toast by acting out the word *popped.* They can be allowed to use their individual creativity to express this movement word. This strategy is particularly great for learning weekly vocabulary words. Finally, there are numerous books that work well for integrating literature, movement, and dance at different grade levels (Kovar, Combs, Campbell, Napper-Owen, & Worrell, 2007, p. 234). For example, the book *Ashanti to Zulu*, by Margaret Musgrove, works well with students in grades 4-5. Each letter of the alphabet is used to introduce the culture and history of the African continent and leaves a lot of room for students to act out and physically interpret the pictures and content of the story (Kovar et al., 2007). Also, *Someone Special, Just Like You*, by Tricia Brown shows how children with disabilities enjoy similar things as other children, but just in different ways. Reading this book can be used to not only teach about disability awareness, but different forms of movement can be discussed and actually used during the lesson (Kovar et al., 2007). These are only a few of the ways in which movement has been used in language arts classrooms. It is up to teachers to look at the content of their lessons and determine the most appropriate ways

to combine movement with academics.

Using Movement in the Mathematics Classroom

No only can movement be used in the language arts classroom, but it can also be implemented during mathematics. In fact, it might even be easier than language arts because math concepts tend to be more concrete (T. Cone, personal communication, October 22, 2008). There are a variety of ways in which teachers can use movement to teach such things as numbers, math facts, estimation, and probability. As with any type of movement integration, teaches need to first take into consideration their students' academic and physical abilities. Once this is complete, there are many activities that can be used in the classroom. For younger students, they can partake in an activity called Jumping Numbers. In this, students are asked to form numbers with jump ropes and their bodies. Then, in small groups, they can create addition problems using these same bodily formations (Kovar et al., 2007). To teach measurement and estimation, students can be asked to measure the distance between two objects by determining how many hops, steps, or finger lengths it would take to get from one to the other (T. Cone, personal communication, October 22, 2008). This helps students understand that measurement does not always need to be with a ruler and shows how our bodies can help us to estimate distance. Also, instead of showing five objects to teach the number five, students can be asked to demonstrate five jumping jacks or five lunges (T. Cone, personal communication, October 22, 2008). The same type of movement can be used to teach addition, subtraction, multiplication, and division facts. In fact, a game called Dice Math is an extremely fun and educational activity that can be used at all grade levels. Students are first asked to form a circle. Using two or three large play dice, children are then asked

to use the rolled numbers to act out a certain movement. Younger children can be asked to add the dice total and do that many jumping jacks/sit-ups/crab-walk steps etc. Older children can perform the same movement skills, but the math skills can be altered to coincide with the concept being taught. For example, the two dice can be multiplied together or the numbers rolled can be used to form an algebraic equation (Kovar et al., 2007). These are again only a small number of activities that can be used to incorporate math and movement in the classroom.

Conclusion

As the review of the literature suggests, movement should be effectively implemented into the academic curriculum of all teachers. As shown by Gardner's theory of multiple intelligences, bodily-kinesthetic learning is an important way to teach both special and general education learners concepts in all subject areas. Unfortunately, though, teachers often overlook this type of learning, preferring to create their curriculum based on the linguistic and mathematical intelligences. Movement, though, is extremely important to the classroom because it actively involves students in their learning, helps to foster a motivation to learn, decreases inappropriate behaviors, can elevate student's moods, and, because it is a form of implicit learning, is more easily retained. Reading out of textbooks and listening to lectures are fine, but when a student is able to interpret that information through movement or some type of physical activity, the learning of that concept grows. In fact, brain research has even shown that movement strengthens the same part of our brain that processes learning. The benefits of academically using movement in the classroom are shown to be great and there are a variety of ways in which it can be implemented in both the language arts and mathematics classrooms.

Because of this, teachers need to take a good look at their curriculum and develop ways to use movement in order to enhance their students' learning. It is vital that children become active learners!

It is hoped that this particular study will shed additional light onto the use of movement and kinesthetic learning in a fourth grade elementary classroom. Different activities and strategies will be employed to help facilitate the learning of the curriculum content. The next chapter of this thesis will look at the design of my research study based on the examined research reviewed.

CHAPTER III

Context and Methodology

Introduction

Chapter three is divided into two sections: the context of the study and the research design. Section one takes a close look at where my research was conducted in terms of the surrounding community, the school, and the actual fourth grade classroom. Section two provides a rationale for teacher research and discusses the qualitative research paradigm in this study. It also outlines the different sources of data used to help inform my research.

Context of the Study

Community. The Township of East Greenwich is a residential and farming community located in Gloucester County, New Jersey. Made up of the communities of Mount Royal, Clarksboro, and Mickleton, this district continues to expand in size and population. As of the United States 2000 Census, there were 5,430 people, 1,901 households, and 1,515 families residing in East Greenwich. 94.68% of the township is White and the median household income is $65,701. Needless to say, the township in general is considered to be one of the more wealthy ones in southern New Jersey.

When driving through East Greenwich, one will come across a multitude of new housing developments and seemingly endless acres of farmland. With the continuation of houses being built, it is expected that the population in East Greenwich will dramatically increase over the next few years. In fact, there is currently much construction and road

work being done on both the streets and neighborhood buildings to increase the overall aesthetics and safety of the town. Contributing to the success of the community, the East Greenwich Police Department is a visible entity in town, making sure laws are being followed and ensuring the safety of drivers through the construction zones. Additionally, the people of East Greenwich are looking forward to the creation of a new movie theater and shopping center to help stimulate the town's economy.

The residents of East Greenwich Township take immense pride in the history of their community; in fact, their town motto is "Preserving the Past While Embracing the Future." This statement is clearly exhibited when one walks through the community because while there is a large focus on developing and expanding the community, there is just as large an emphasis placed on many of the town's historical sites. For instance, the Little Red Schoolhouse was built in 1810 as a Friend's School, and was the first school house in Mickleton. Also, the George Craft III House, built in 1885, was the home of Quaker author, Elizabeth Gray Vining, in 1951 and 1952. She wrote her book "Windows for the Crown Prince" while living here. Many other historical houses, places of worship, cemeteries, and buildings are scattered throughout East Greenwich and are maintained by a variety of historical societies. It is quite obvious that the residents are proud of their town's rich historical background, but still look forward to the new developments that continue to grow in their community.

East Greenwich School District serves students in grades K-6 in two elementary schools. Jeffrey Clark School houses grades K-2 and Samuel Mickle School holds children in grades 3-6. Both schools are located on the same track of land and it is a mere two-minute walk between the two. For grades 7-12, students are educated by the

Kingsway Regional School District at the Kingsway Regional Middle School and the Kingsway Regional High School. This district not only serves students from East Greenwich, but also students from Logan Township, South Harrison Township, Swedesboro, and Woolwich Township.

School. Samuel Mickle Elementary School is a public 3-6 elementary school situated on Kings Highway in East Greenwich Township. With an enrollment of 427 students, this school has been built and developed with the goal of meeting the needs of students, parents, and school personnel. The average class contains approximately 20 students and 100% of the population's first language is English.

Samuel Mickle School has been organized to provide instruction for the core academic subjects and special area subjects, such as physical education, art, music, library, computers, and Spanish. Third and fourth grade classrooms are located at one end of the school, while the fifth and sixth grade classrooms are housed at the other. They are separated by the school's office and the East Greenwich School District administrative office, which are both located in the center of Samuel Mickle Elementary. This allows teachers to have easy access to both their principal, Mrs. Loretta Savidge, and the district's superintendent, Mr. Joseph P. Conroy. Three large atriums divide this immensely large school into its different parts, making it very common for a third grade teacher to never see her sixth grade colleagues throughout an entire day. A large gymnasium is located in the eastern portion of the school, while the cafeteria and the Large Group Instruction (LGI) room are located in the western portion. The LGI is somewhat the equivalent to an auditorium except without any chairs. Here, teachers can bring together whole grade levels to teach a new concept or to listen to a guest speaker

Children in general love coming to this room.

In terms of physical appearance, Samuel Mickle School has been renovated in recent years and has received numerous funds that have helped to create classrooms that are truly up to date with the times. The District successfully passed an $11 million school expansion project to address the increased school enrollment and has been fortunate enough to receive over $200,000 in Federal Technology Grants. These grants have allowed the school to purchase several SMART boards and two mobile portable laptop labs for classroom teachers, create two computer labs with twenty-five workstations in each, and develop a distance learning technology lab that allows students at Samuel Mickle to learn and interact with educators throughout the country. In addition to these technological improvements, the school also houses a beautiful library/media center that has been fully automated since 1995. Students participate in the Accelerated Reading Program in which they are required to read designated books and then take a test on the computer to check their understanding of the book. They then receive points and prizes based on the number of book tests they complete. The goal of this program is to encourage students to become lifelong readers.

Samuel Mickle School houses the Child Study Team, comprised of a director, psychologist, social worker, speech teacher, and guidance counselor. With 10.8% of the school population requiring an Individualized Education Program, this group of professionals works closely with students who attend the resource center and the self-contained classrooms. Those students who require remedial help in language arts or mathematics receive basic skills instruction.

Furthermore, since every school in New Jersey and the United States must show

evidence of adequate performance on standardized tests in math, language arts, and science due to requirements set forth by the No Child Left Behind Act (NCLB), Samuel Mickle must do the same. The school utilizes the following assessments: the NJASK3 in language arts and math, the NJASK4 in language arts, math, and science, and the NJASK5 and NJASK6 in language arts and math. The 2007 NCLB Report Card showed that Samuel Mickle achieved Adequate Yearly Progress and has achieved a 96.9% attendance rating. The teachers have shown commitment to their profession with a 98.9% attendance rating. Fortunately, only 0.7% of students were suspended and none were expelled.

Mrs. Loretta Savidge, Samuel Mickle School's principal, always encourages her staff to improve their teaching methods through in-service days, teacher conventions, teacher retreats, and the mere sharing of great ideas at staff meetings. She wants her staff to be up-to-date with the current trends in education and provides them with the time and resources they need to become more proficient in specific subject areas. One of Mrs. Savidge's biggest goals is to reduce bullying throughout the school. As a result, she instituted a new bullying committee to draft an improved discipline policy that outlines specific consequences for specific negative behaviors. Additionally, she and her staff place a large emphasis on character education through a variety of programs that deal with the concepts of respect, sportsmanship, patriotism, integrity, honesty, responsibility, kindness, courtesy and tolerance. A few of the programs sponsored by the character education program are: a coat and blanket drive, a food bank fund drive, and a "Souper Bow" collection to assist a nearby soup kitchen. Plus, students are required to sing a patriotic song each morning after the Pledge of Allegiance and inspirational quotes that

foster positive personality traits lines the hallways at Samuel Mickle.

Classroom. Mrs. Judy Frett's fourth grade classroom is made up of twenty-four very unique students who exhibit a variety of characteristics, personalities, and learning styles. Of these students, ten are male and thirteen are female. The makeup of the class is almost homogeneous with twenty-one of the students being White, two African American, and one Indian.

One male student, Danny, is classified under IDEIA as having a Specific Learning Disability and is assisted by a personal aide throughout the entire school day. In addition to receiving some minor modifications as specified in his IEP, Danny also talks with the school psychologist once a week to improve his emotional well-being; he tends to be very hard on himself and often focuses on the negative rather than the positive. Danny currently attends Mrs. Frett's class only for social studies, science, and health. His homeroom is a Multiply Disabled classroom for 3rd and 4th graders and he receives math and language arts instruction with another teacher in the school. At the beginning of January, when Danny was placed in Mrs. Frett's class, he had extreme difficulty transitioning in the class and would more often than not have emotional breakdowns during a lesson, forcing him to leave the room to calm down. After some time, though, Danny has begun to feel more comfortable within the classroom community and is in fact an active participant in all class discussions. Besides sometimes being given extra time to complete his work, Danny does not receive any modifications during social studies, science, and health because he is able to successfully function on grade level with his peers. On a similar note, two girls in the class receive speech and language instruction twice a week and one boy has been diagnosed with ADHD and receives medication to

help reduce his hyperactive tendencies.

In general, the students in this class get along with one another and support each other during such things as oral reports and literature circles. In fact, there are weekly trivia questions posted in the classroom that the students are expected to research and answer. If a student correctly answers all three questions, he/she receives a prize and the entire class gives him/her a rousing applause. It is nice to see ten-year-olds get excited for the achievements of their peers. The class, though, is not without instances of bullying and arguing between certain students. There are a few children who feel the need to tease their peers, while one in particular likes to draw negative attention to himself in front of his classmates. Both types of issues tend to disrupt the natural flow of the class and appropriate consequences are given to help reduce the occurrence of negative behaviors.

Overall, there is a true learning community within the four walls of Mrs. Frett's classroom. The children's work is displayed throughout the room and they are constantly encouraged to be active participants in all lessons. In fact, a Smart board is utilized every day to show photographs, movie clips, sounds bytes etc. and the children are often allowed to come to the board to lead an activity. They are all very comfortable using the Smart board and are even learning how to create their own Smart board slides. It is a wonderful piece of technology that truly brings the children together. A major characteristic of this classroom is that there is a very distinct line between the students who are motivated to learn and those who are completely uninterested. Those who are motivated raise their hand to speak, ask questions, complete all of their homework on time, and generally have a pleasant demeanor. Those who lack motivation do not care about their homework grade, stare into space during lessons, and often exhibit negative

behavioral traits. Mrs. Frett works hard to encourage these children to work harder, but it is proving to be a difficult task. The room overall, though, is a positive and engaging place for the students to learn and grow.

Research Design and Methodology

In contrast to more traditional research, teacher research, as used in this study, "is a powerful way for teachers to understand how they and their students construct and reconstruct the curriculum" (Lytle & Cochran-Smith, 1992, p. 458). Teachers take a deep look at their own practices in order to stimulate change in their own classrooms. Teacher research "has the potential to alter profoundly the culture of teaching- how teachers work with their students toward a more critical and democratic pedagogy, how they build intellectual communities of colleagues who are both educators and activists, and how they position themselves in relationship to school administrators, policymakers, and university-based experts as agents of systematic change" (Lytle & Cochran-Smith, 1992, p. 470). The design of this research study is qualitative, meaning that it explores general questions, invites participants' questions, uses text-written words to document variables, and allows the researcher to take a subjective stance as a participant observer (Browne & Madden, classroom lecture, September 12, 2008). Qualitative inquiry strategies such as video-taped lessons, student work, individual interviews, and observations written in my own teacher research journal are used. When the data is collected over the course of the spring 2009 semester, student experiences and academic performance are looked at to determine what happens when movement and kinesthetic learning is used in the classroom to teach academics.

Research Study. This research study gradually incorporates the use of movement

in the fourth grade elementary classroom, going from incorporation in one subject area to an actual infusion across the curriculum. During phase one of the research study, I create and implement a social studies instructional unit on the history of New Jersey using movement as the complementary mode of learning. I closely observe what happens to the children throughout the implementation of the unit and make note of how the learning environment is or is not transformed. Student reactions to using movement as a way to teach and learn academic content are documented as well. When the unit is complete, the infusion of movement across the curriculum begins. By incorporating movement into everyday lessons, it is hoped that it becomes second nature for the students to learn kinesthetically. Again, observations of how this infusion affects teaching and learning are documented.

Sources of Data. For this study, four types of data collection instruments are used: video-taped lessons, written student feedback, individual interviews with students, and observations written in my own teacher research journal.

The first data source being used is video-taped lessons of students participating in academic movement activities created throughout the semester. The purpose of the camera is to capture the students' learning process through the physical movements used in the lessons. Without a video camera, it is extremely difficult to truly describe their movements and how these movements are affecting the lesson. The video camera is also used to capture student skits and performances based on the topics being studied.

The second data source is written student feedback that is collected at the end of each kinesthetically-based lesson. The children provide me with information on how they feel the incorporation of movement into the curriculum is affecting their learning.

Example reflection questions include:

- What are your thoughts about today's lesson?
- Did you like being allowed to move during today's lesson? Why or why not?
- Do you think that today's lesson was helpful or confusing? Explain.

Other questions, which deal more specifically with the topics being studied, are also incorporated into the written feedback forms.

The third data source being used is individual interviews with students. In hopes of gaining student perspective without being watched by their peers, I met with students on an individual basis to discuss their thoughts on the incorporation of movement into their classroom. Unfortunately, due to time constraints, not all of the children were given the opportunity to meet with me on an individual basis. Some example interview questions include:

- How did you feel when I asked you to move during the lessons?
- Did the movements help you understand the lesson better? Explain.
- Do you ever use the movements while doing your homework or taking a test?
- Do you think this is a fun way to learn? Why or why not?
- How do you think you will do when you are given a test on this information?

The fourth data instrument is my own teacher research journal in which I record all of my observations, thoughts, questions, and ideas regarding the infusion of movement in the fourth grade classroom. In addition, I document the everyday classroom occurrences and any moments that truly stand out. These reflective writings provide valuable information about the academic progress of the students.

Data Analysis. The data received throughout the semester, including video-taped

lessons, student written feedback, individual interviews, and the teacher researcher journal, are used to draw conclusions about what occurs when movement is used to teach content in the classroom. The qualitative data is organized and analyzed to determine ways that movement might impact student learning and motivation. In order to analyze the data, I sort and categorize it within and across data sources to find patterns within my research. I also look for any disconfirming pieces of evidence that go against my original data categories.

What's Next?

Chapter four discusses the results of the video-taped lessons, students' written feedback, individual interviews, and the information contained in the teacher research journal. Chapter five presents the conclusions and implications of the study and recommendations for further study.

CHAPTER IV

Data Analysis

Introduction

Chapter four discusses and analyzes the findings of the study undertaken to answer the key research question, "What happens when movement and kinesthetic learning is implemented academically in a fourth grade classroom?" A look across all data sources seems to suggest four main themes that recur throughout the research study. These include effective uses of movement, using movement to increase understanding of a topic, the connection between movement and student engagement, and fostering positive collaborative experiences.

Revisiting the Study

As stated in chapter three, I collected my research in two main parts. First, I incorporated the use of movement and kinesthetic learning into a social studies unit on explorers and settlers in the colony of New Jersey. Then, I went on to infuse this style of teaching into other academic areas including language arts, math, and health.

The social studies unit was created using Chapter 4: Europeans in New Jersey from the textbook New Jersey Social Studies written by Scott Foresman. I based all of my lessons on the information provided in this chapter, intensely incorporating kinesthetic activities into each. The process of creating the social studies unit was constructivist due to the fact that I used what the children knew and said during one lesson to help inform the next lesson and so on and so forth. The unit was in no way

completely created at the start of the chapter, but rather the activities evolved and shaped based on the needs of my students. With that being said, it is important that I briefly describe each kinesthetic activity that was implemented during the unit.

At the start of the unit, the students learned about different explorers, including Henry Hudson, Giovanni da Verrazano, and Cornelius Mey, who were in search of the Northwest Passage to China, but ended up landing in or around New Jersey. After teaching about each one, I created large continents out of green butcher paper and spread them out over the entire classroom floor. Split into groups of the five, the children were required to map the routes of their assigned explorer using different colored arrows. The assigned explorer routes were: 1. Hudson, 2. Verrazano, 3. Mey, 4. Land Route to Asia from Europe, and 5. Original Water Route to Asia. In addition to moving around the world map to label these routes, students were also asked to label different countries, oceans, and continents. This allowed the students to physically "walk" the routes that these explorers took to help them better understand the content of the lesson.

For the next kinesthetic activity, I decided to expand upon the explorer lesson by creating a three day mini-unit on how these explorers would navigate the high seas, placing particular focus on how they would use a compass to reach their desired destination. On the first day, I discussed cardinal directions and the purposes of a compass, both back then and today. I then taught the children how to create their own compass using water, a needle, a piece of tin foil, and a magnet. Everyone was very excited to watch as their needle pointed towards the direction of north. On day two, the students learned how to use an actual compass and, after much modeling, practiced using their compass while walking around the room in groups of three. I had the students turn

their bodies in different directions and reminded them that their needle always needed to point north. This took some time to get used to, but it proved to be a fun kinesthetic activity. Finally, on day three, the students participated in an activity that I called "Mapping Uncharted Territory." The objective of the activity that was placed on the Smart Board was as follows: "You have been sent on an expedition to the New World in search of the Northwest Passage. It is your group's job to find three of the starred points in the school using your compass. After finding all of the starred points like a real explorer, you must create a map that charts your route!" The students were placed into groups of three and were each given a specific role for this project. The Direction Director was required to write down the number of paces and compass directions that his/her group took to find the stars. The Compass Holder was required to walk very slowly while carefully holding the compass. He/she had to count out loud the number of paces that he/she took in each direction. The Journalist was required to draw quick pencil sketches of what the group saw on their journey. After all of the students found the hidden stars by walking around the school hallways and properly using their compasses, they had to follow a rubric and create a map charting the route they took to find each star. They were also required to write a five sentence paragraph in response to this writing prompt:

> "Imagine that you are Henry Hudson or Giovanni da Verrazano sailing across the Atlantic Ocean. How does it feel to have to rely on a small compass to guide you across the entire Atlantic Ocean? What is it like to leave your family? How would weather affect your journey?"

This series of activities was created after I witnessed my students' intense excitement and

interest during the explorer mapping activity. I wanted to expand their knowledge and again give them a feel of what it would be like to be an explorer coming to a new world.

When we finished part one of the chapter, I wanted to create an activity that combined kinesthetics and an educational review. I decided to create a "Fact Matching and Moving" activity that required students to move around the classroom, problem solve with their classmates, and understand the content of part one. Before beginning this activity, I used the Smart Board to review the information we had discussed over the past two weeks concerning explorers, the Northwest Passage, New Netherland, New Sweden, and the transfer of power in colonial New Jersey from the Dutch to the English. For the kinesthetic portion of the lesson, I gave each child a piece of rectangular construction paper that contained half a sentence about something we had learned about in the chapter thus far. Some of the children had the beginning parts of sentences, while others were given the ends. Altogether there were twelve sentences that needed to be correctly matched up. Some examples sentences included:

- Giovanni da Verrazano was an Italian explorer sailing for France.
- Charles II gave the land of New Netherland and New Sweden to the Duke of York.
- Dutch settlers traded blankets and kettles for fur with the Delaware Indians.

The children then needed to leave their chairs and find the matching piece of their sentence, utilizing what they already knew about the information given in their half of the sentence. When the students were done walking around and felt confident that they had found their match, I had each pair come to the front of the room, read their sentence, and explain its importance to New Jersey history.

I then taught a short thinking skills lesson from the textbook on identifying facts and opinions, incorporating kinesthetic movements to help the students better distinguish between the two. We first read the information provided in the text about the differences between fact and opinion sentences and tried a few example problems. I then taught them two hand movements to use after I read either a fact or opinion sentence. If they thought that the sentence was a fact, I asked them to take their pointer fingers and point to the palms of their hands, as if they were pointing to a fact in the book. This helped them remember that facts are true statements that can be proven. If they thought that the sentence was an opinion, they had to point to their own brains, reinforcing that fact that opinions come from a person's head and cannot be proven or disproven. After practicing the movements, the students were required to respond to different statements I read out loud. For instance, if I said the sentence "Peter Stuyvesant was the governor of New Netherland," the children were expected to point to the palms of their hands to show me that they knew this statement was a fact. These movements were used not only as way to help children to differentiate between facts and opinions, but were also a great informal assessment tool for myself.

For the next kinesthetic activity, I had the students act out two of the most important vocabulary words from the chapter: tolerance and persecution. These are two very abstract concepts that can be difficult for fourth graders to truly understand, and I wanted them to work with their classmates to come up with creative ways to represent both. We first talked about the difference between the two; we defined tolerance as respecting other people's opinions and beliefs, and we described persecution as being cruel or unfair treatment. In the context of New Jersey history, we discussed how the

Quakers left England because they were religiously persecuted and eventually established their own towns where they practiced religious tolerance. We also briefly talked about how persecution is still present in today's society. I then split the class up into four heterogeneous groups and instructed each group to create two separate silent skits showing the difference between tolerance and persecution. I decided to not allow them to talk because I wanted them to come up with exaggerated movements, gestures, and facial expression to force them to think more deeply about what the two vocabulary words actually "look" like. Each group was given approximately fifteen minutes to create and practice their skit before presenting it to the rest of the class.

For the last lesson in the social studies unit, I had the students create a human timeline to help them better understand the order of events that we discussed throughout the chapter. Each child was given a piece of construction paper with an important event, minus the date, printed on it. They then had to collaborate with their classmates to determine the order in which they should stand in the human timeline. Once they felt as though they were standing in the correct chronological order, I revealed to them the actual dates of each event and allowed them to make adjustments in their timeline as needed. Because of the size of the class, I had to split the class into two groups and have each work on the same timeline on opposite sides of the room. This activity allowed the students to physically interact with some of the most famous historical events in New Jersey history and gave them a visual representation of how they were related to one another.

At the conclusion of this unit I then had time left in my student teaching placement to infuse kinesthetic learning into the everyday curriculum of the classroom.

Although I tried to use movement-based learning on a daily basis, there are four key lessons that I chose to include in this research study. In math, I had the student play Dice Math, as mentioned in chapter two. I had my students practice their multiplication facts and asked them to first multiply the two numbers together and then do that many jumping jacks/sit-ups/crab-walk steps etc.

For health class, I taught my fourth graders about the parts and functions of the different body systems. In an introductory lesson to the body, I was explaining to my children the difference between cells, tissue, organs, and body systems. I created wonderful slides on the Smart Board with pictures, definitions, and video clips, but I still felt as though they were getting confused. On the top of my head and mid-lesson, I decided to teach them movements that would help them differentiate between these four different, but very connected parts of the body. To kinesthetically show the word *cells*, the students put their pointer finger and thumb together to represent how small cells are. For the word *tissue*, they touched their fingertips together and flattened out their hands to show how cells make layers of tissue. For the word *organs*, they cupped their hands together to make a circle to show how those original cells have created something much larger. Finally, for *body systems*, they circled their entire bodies with their hands to show how there are systems of organs throughout their body. We practiced these hand movements a few times and I had the students fill in the blanks from a statement that I read out loud. They were required to not only verbalize their answers in unison, but were also asked to show the hand movements in unison. The statement went as follows:

> "The smallest living parts of your body are ____ (cells). Groups of cells working together create ___ (tissue). Groups of tissue working together make ___(organs).

A group of organs working together with a similar function make up a_____ (body system)."

Finally, during language arts, I created a lesson entitled "Prefix Match Up and Act Up" that I taught in front of the principal, Mrs. Savidge. On the Smart Board I first gave the students some background information on the origin and purpose of prefixes in the English language, discussed example prefixes and their meanings, and played a short educational cartoon clip on the topic. I then gave out a worksheet that charted some of the most widely used prefixes (dis-, mis-, pre-, re-, anti-, ex-, deca-, and tri-) and their meanings. After discussing this sheet, I began the kinesthetic portion of the lesson by placing either a prefix or base word necklace, made out of construction paper and ribbon, on each child. Half of the students wore prefixes and the other half base words. Based on their knowledge of the meanings of each prefix, the students had to work together to find the person who had either a prefix or base word that would complement the card on their necklaces. For instance, the child with the prefix *re-* found the person with the base word *create* on his or her necklace and determined that this was a match that made sense. After they walked around the room and found their matches, they had to sit with their partners and complete three short assignments. They had to write down the meaning of their words, use it in a sentence, and then create skits to demonstrate their understanding of both the word and the prefix. These skits were then performed in front of the class.

Although I would have loved to create more kinesthetic activities across the curriculum, my time at Samuel Mickle came to an end in the middle of May. These lessons, though, definitely represented what I had originally hoped to accomplish when I set out to use movement and kinesthetic learning to teach academics.

Effective Uses of Movement

Without constant supervision, established rules, and a clear behavior management plan, a typical fourth grade classroom can become a difficult place in which to teach. Students are beginning to become more assertive as they end their pre-teen years, and it becomes more important to impress friends than to listen to adults. When movement and kinesthetic learning are added into the mix, it can become even more difficult to retain control of a class, while at the same time impart knowledge upon each child within that class. Although kinesthetics are a wonderful way in which to reach different learners and keep students involved in their learning, I have discovered from my research that there are certain strategies that a teacher should employ in order to be effective.

After looking through all of my data sources, I have come to better understand what needs to be established in a classroom learning community in order to use movement activities successfully. Because I had limited experience using kinesthetics in the classroom prior to my student teaching placement, a lot of trial and error took place as I developed what I now feel are effective strategies.

Prior to starting my research, I noticed that Mrs. Frett's classroom did have constant supervision, established rules, and a clear behavior management plan. The children were generally well-behaved and pleasant during her lessons, and I assumed that when I introduced kinesthetic learning into their lives, they would react in the same manner. I was wrong. For my first lesson, when I had the children map the routes of famous explorers on the large continents on the floor, many difficulties quickly arose. For one, I had several students running "around the globe" as if they were running around in gym class. Looking back at my videotape, I even heard one boy say, "Hey Matt, quick,

run over here and look at this bug!" While quickly walking over, Matt stepped on Africa without even a second's thought. The entire class did not feel the need to run around, but there were a few unruly boys who chose to do so. Although I anticipated chatter among the different groups as they used their books and prior knowledge to map their routes, the room was too noisy. Even when I got the children to calm down, they would start making an extreme amount of noise five minutes later. I also noticed on the tape that there were a couple of children who were completely off-task and were not contributing to their group's work. Jacob and Zack, who were supposed to be working on an explorer information chart prior to mapping their route on the floor, were instead discussing the release of a new comic book. They did not even finish their chart, all of the answers to which could have been easily found in their textbook. Marissa and Danielle, who are typically great workers and conscientious students, were also at one point looking at a children's novel in one of their desks when they should have been helping their team place the arrows on the world map. It was as if they were a different class. I was so used to them listening to my directions, asking constructive questions, and working well together that I had neglected to come up with a clear decisive plan for how I would conduct these kinesthetically-based lessons. It quickly became obvious that my children viewed this type of activity like they would a recess activity, rather than as an assignment to be completed. As the teacher in charge, I needed to establish and enforce different rules for these types of lessons.

For the rest of the lessons in my research study, I took a different approach to kinesthetic learning; instead of quickly jumping into the lesson, I chose to take a few minutes before each one to carefully set some ground rules. Prior to beginning each

kinesthetic activity, I explained to the students what we would be doing that day, pointed out the purpose of the activity, modeled how the activity should be done, and clearly spelled out the rules. The rules for each activity were basically the same, but I felt that it was important to reiterate them each time. They were told that there would be no running, no screaming across the room to their peers, and no fooling around. They were required to complete each activity because they would be graded. If I found a student breaking any of these rules or to be doing something off-task, he/she was not allowed to participate in the activity and instead had to complete extra worksheets that I had on hand. With this speech being given before each activity, the behavior of my students improved ten-fold. I only had to take a student out of an activity five times during the course of my research study: twice for off-task behavior, once for running in the hallway during the compass mapping activity, and twice for being too noisy. I was very pleased that I only had to resort to this action five times and I truly feel that my establishment of clear rules and expectations played a large role in getting my class to this point.

I also found that in order to implement effective movement activities, teaching students how to transition is imperative. For adults, transitioning from one activity to the next is second nature, but for children, this simple task needs to be discussed and repeatedly modeled. Because of this, I would clearly let my students know when we would be transitioning from moving around the room to sitting back in our seats. I clapped my hands in a rhythmic manner that prompted them to clap back to me and settle down. Thinking back to my experiences in the fourth grade room and watching the videotape of all my lessons, I realize that this simple clapping method was the best thing I could have done to help my students learn to transition. They became so comfortable and

so familiar with this method that once after clapping, Katie told her neighbor, "Come on guys, we need to transition now." Knowing the appropriate teaching vocabulary also made them feel important and adult-like. No matter what type of transitioning method a teacher uses, whether it be clapping, flicking lights on and off, or ringing a bell, it is important that students know the purpose of the method and fully understand what is expected of them. This helps to make kinesthetic activities, which tend to have students moving around in various parts of a room, easier to manage.

I definitely saw a change in my class when I learned how to introduce and manage my kinesthetic activities. I became more aware of the fact that this was a type of learning that they were not used to and therefore directions and expectations needed to be clearly established. For instance, during the tolerance and persecution skits, the students made a smooth transition from planning their skits with their group members to sitting in their chairs to wait for further directions. Mrs. Savidge, the school's principal, noted in her official observation write-up that I "maintained a smooth transition from one activity to another" and "effectively reviewed the rules for the activity, reminded the children about the cue to come together, and warned the children on how 'not' to behave." Even during the compass activity, where I had students walking the hallways to find starred points, the students were generally well-behaved because they knew I had set high expectations for them. I truly feel that if a teacher lets her children feel that being sub-par is acceptable, then students will produce sub-par results. This holds particularly true during kinesthetic activities that ask young children to do something that is not typically accepted in a classroom; moving around and talking with your classmates becomes accepted and even valued when kinesthetics are brought into the mix.

Using Movement to Increase Understanding of a Topic

As discussed in chapter two, there is a strong connection between the brain and movement, particularly in the developing minds of children. According to Greenfield, our thoughts and actions mold the strength of connections between neurons in the brain; these physical connections represent what we know (2008). Therefore, "if you can maximize the strengths, and breadth, of connections associated with a particular concept, you increase the chance of making it stick" (Greenfield, 2008, p.36). This means that movement has the ability to reinforce the connections between neurons, which can ultimately lead to greater learning. Knowing the impact that movement can have on a child understanding and retention of information lead me to see how movement affected my fourth graders understanding of the content I was teaching them. I decided to analyze my data sources by looking at both the children's perceptions of their learning and my own perceptions of how well they were learning the academic content.

Although I understand that a child's perception can be skewed based on his or her desire to do well or to please a teacher, I strongly felt that it was important to look closely at my students' perceptions of their learning and combine them with my own analyses. After almost every lesson, I had the children complete written feedback on the lesson and asked them to reflect upon their learning. It quickly became apparent that they had never done this before because many did not know what to write and asked me an innumerable amount of questions. I explained to them that this was a way to let me know how the lesson went and to help me better understand what parts of the lesson were confusing. These reflections were also a way to help me understand how the class was reacting to the kinesthetic portions of the lessons. Many simply wrote that the lessons were "fun,"

but I later asked them to expand upon their responses. After the lesson on facts and opinions, Mitch wrote that the movements helped him, "because you can memorize them easier." When I later asked him to explain the difference between facts and opinions, he was able to do so easily. Even though I did not ask him to, he used the hand movements we learned to help better explain his answer, proving that the kinesthetics made an impression on him and his understanding of the lesson.

During the "mapping the routes" lesson, I noticed many of the students looking through their books to help them find and map their explorer routes, taking their time to make sure it was close to perfect. I even heard one child say, "Oh! This makes more sense now because it's big and I can move around it," meaning that the enlarged world continents helped him visualize the information that was only written in the text. When I talked to this student later in the day, he was able to explain to me the five different routes we discussed with ease. I was so proud of him! I also had one very shy girl in my class, Shannon, state in her reflection, "I think it was helpful so I could get a picture of it if it's on a test. It will be easier to remember." Looking back at the video from this lesson, I even noticed that Shannon, who is normally extremely reserved, was highly motivated by the activity and was one of the most active participants. She was moving around the world map, walking from continent to continent, trying to determine the route that Henry Hudson took to reach the Hudson River. She even became a leader in her group when one of them later asked her to somewhat reiterate the different routes we had discussed. She explained,

> "Well when Hudson traveled from the Netherlands, he first went this way (walks up towards Norway and Sweden) and then see when I go this way it shows how

he crosses the ocean and lands over here kinda where New York is now (points to the Hudson River and Hudson Bay area)."

This shows how she associated her understanding of the content of the lesson with the physicality of moving around the world map.

After the fact matching lesson, the majority of the children wrote in their reflections that this type of review was more helpful than doing a worksheet. Justin, a child who is often unaffected by lessons, wrote, "[The information from the chapter] got more in my brain. Now I know why the Europeans came to America. They wanted to find the Northwest Passage." In fact, a lot of the children used the phrase "got in my brain" or "stuck in my brain" to describe how the movements or moving around the classroom helped to increase their learning. I found their word choice to be interesting due to the fact that there is an actual connection between physical activity and the brain. In response to the question, "Did you like being allowed to move during today's lesson?" Jacob even wrote, "Yes because when I'm moving I remember more." Caitlyn wrote, "I wasn't 100% sure about everything we learned about this week until today...the moving part of the lesson was helpful because I didn't have to stare at the board." Based on the students' reflections and my own observations, I ascertain that the children not only enjoyed being allowed to move around the classroom to match up social studies facts, but it helped them to retain and understand the information as well. When they were given the lesson one quiz from the textbook, sixteen students earned an A, five received a B, and only three got a C.

When analyzing my data sources, I noticed that many of the children made personal connections to the content of the lessons, particularly due to the kinesthetic

activities that they participated in. Based on data from the videotaped lessons and the student reflections, I quickly began to see my students benefitting from the kinesthetic portions of the lessons; these activities assisted them in making connections to their own lives or to the world around them. When students are able to make these types of connections, it shows that deep and meaningful learning is taking place. For instance, after the compass exploration lesson where the students had to pretend to be explorers to map uncharted territory using a compass, Jalen wrote on his feedback sheet, "I liked doing this because it made me feel how people back then felt. It must have been really hard to be an explorer. I thought it was fun and I enjoyed it." I was particularly impressed by Jalen because he is a student who never makes connections to lessons, rarely turns in his work on time, and is often in another world when an adult is talking to him. I think that the kinesthetics really helped a boy like him because it allowed him to channel his pent up energy and focus more of his attention on the lesson. This in turn helped him to make more personal connections to his own learning. Similarly, Marissa wrote, "[The lesson] really helped me understand what Henry Hudson and Giovanni da Verrazano did. I felt frustrated just like they must have when we couldn't find something." Moving around the hallways to find the different points resonated with Marissa on a personal level, and she connected her movements to the movements that the explorers took many years ago.

The tolerance and persecution lesson also seemed to have made an impact on the students due to the amount of personal connections that were made in response to the silent skits. The persecution skits in particular really forced the children to think about the realities of the world. Being able to pretend to be someone who is persecuted for having

different beliefs helped the children to better understand what the word meant. For example, one group had people praying with their hands folded, looking towards the sky. Two officers came up to the worshipers, shook their fingers at them in disapproval, handcuffed them, and put them in jail. Once in jail, the worshipers began to cry. Their deep understanding of persecution was evident in this short skit because they helped their audience to realize the emotional and physical impact persecution, particularly religious persecution, could have on a group of people. Caitlyn, explaining what this silent skit demonstrated, stated that, "The Quakers were practicing their religion and Rachel and I came over and we didn't like what the Quakers believed in so we put them in jail. We shook our hands at them to show that we thought their religion was bad enough that they should be locked up." She clearly took what she learned from both the book and her own movements to explain the meaning of persecution. In an interview with Kyle, a boy from the same skit group, he reflected on the lesson by saying,

> "My thoughts of the lesson was why they did this to normal people. I learned that people even go to jail just for praying. What if that was my family? What if someone did mean things to me because I was Catholic?"

When I asked him how he felt acting like a persecuted Quaker he exclaimed, "I felt disappointed that the people would actually go against our religion and take us to a different place." By allowing Kyle and the other children to act out the words "*tolerance*" and "*persecution*," they were able to actually put themselves in the shoes of others. We always tell children to *think* about what it would be like to be in someone else's situation, but they rarely get to experience it. These kinesthetic lessons, though, are perfect examples of implicit learning because they allow children to actually experience

different scenarios or even interact with their peers to increase their understanding of a topic. I strongly believe that when a child is able to interact with their own learning and connect what they are learning to the world around them, the learning is deeper and more meaningful.

The Connection between Movement and Student Engagement

Having students understand an academic concept is of course one of the most important aspects of being a good teacher, but how can the students, particularly those who lack in motivation, be expected to learn if they are bored, uninterested, or apathetic? I strongly believe that when students are in engaged in a lesson they are able to learn better and the kinesthetic activities that I created in my research project proved this point.

The children in Mrs. Frett's class were used to learning while sitting in chairs at their desks; they only moved around when transitioning between different classes. The activities that they participated in with me were out of the ordinary for them, but they quickly acclimated themselves to this type of learning and often expressed to me their excitement about my lessons. I think the word "fun" was written in almost every single piece of feedback that I received. Although I am completely aware that lessons cannot just be "fun," I do feel that it is important for students to be motivated to learn. It is vital that they want to come into school the next day anticipating what we will be learning next. In fact, I once had a child come up to me at the end of the day and say, "So Miss Fulginiti what kinesthetic thing are we going to do tomorrow?" A group of kids quickly formed around me, listening intently as I gave them a sneak preview of what was to come. Although it sounds odd to hear a child use the word "kinesthetic," I taught my children how to use the term correctly so that they could understand the importance of

this type of learning.

Looking back at the videotapes, I was pleased to see that there was an abundance of smiles during my lessons. I also noticed that Jacob, who typically plays with tiny objects in his desk, made eye contact with me more often than not during the taped lessons. I don't know if this can be attributed to the fact that there was a videocamera in the room, but, based on his written reflections, I have come to believe that he was truly engaged. After the human timeline lesson he wrote in his reflection, "Kids don't like school because you sit and read out of books and have to memorize it for a test but when we move around, kids might want to come to school wondering what they will do next." This is what is actually important in schools today: students wanting to learn! During the compass activity, I witnessed an exchange between a group of children who were working together to find stars with their compasses.

Kyle: "Look a star! Wee!! Walk east!" (Jumping up and down)

Justin: "Let's keep moving! Turn north now."

Me: "Boys, there is another star in the atrium if you want to find more using your compass."

Dustin: "Oh yes let's go be explorers!"

These boys certainly enjoyed pretending to be explorers and wanted to do extra work because they were so involved in the lesson. They were not required to map all of the stars in the hallways, but they chose to do so because they were enjoying themselves. Social studies class was no longer a chore, but rather a subject that kept their interest. When a child is interested in something, don't they usually strive to excel in it? It is therefore important to note that these boys in particular did very well on this assignment.

The cells, tissues, organs, and body system movements proved to be extremely effective because the kids viewed it more like a dance than as a way to help them learn and retain the information I was teaching them. In the video, all of the children are making eye contact with me, are doing the hand motions correctly, and have excited expressions in their faces. They even ask if we could do the whole routine again! The day after this lesson, I noticed a group of girls talking to Danielle, who was absent the day before and missed the health lesson. Her friends took it upon themselves to teach her the movements and explain to her the meanings behind each one. They were so excited to show her and helped her practice all during recess. The fact that the children chose to do this routine instead of playing a board game was impressive, but I was even more so impressed by the fact that they had retained the information in such detail. A period later, I had Sam come up to me and tell me that Zack had made up a jingle during music class to go with the hand movements. Zack then proceeded to stand up in front of the class and sing this jingle:

> "Cells are the smallest part of the body. Smallest part! Tissue is made up of groups of cells. Groups of cells! Organs are made up of groups of tissue working together. They work together! Finally, groups of organs work hand together to make up our body systems. Body systems yeah!"

The class cheered in excitement and proceeded to ask Zack to teach them how to sing his song. This lesson clearly took on a life of its own because the children were captivated by the "dance" I had taught them. I could see that their interest and engagement in this lesson also lead to increased understanding because, three weeks later, when I asked the children to tell me the difference between cells, tissue, organs, and body systems, 100%

were able to do so using the movements.

I also found that many of the students noted in their written reflections that the movement-based lessons helped them to concentrate on the subject being taught because they were less bored and more connected to their own learning. After the lesson where students had to map the routes of famous explorers on the large world map, Rachel wrote, "When kids learn sometimes they get destracted (distracted) by something but when I move around and learn I don't get destracted (distracted). I loved it!" After the Dice Math activity, Byron commented on the moving aspect of the lesson by writing, "It helps kids concentrate more, not just sitting and getting bored." Macie even wrote, "Sometimes kids get tired and it wakes you up." By allowing the kids to release their pent up energy, I found that they were better able to focus than when they were told to sit in a chair all day, and, based on their reflections, they felt the same. Being allowed to engage in movement-based activities helped my students to find learning fun and, as a result, they increased their understanding of a topic. Understanding and engagement surely go hand in hand when it comes to educating children.

Fostering Positive Collaborative Experiences

For the most part, the students in my class get along with each other, but there are inevitably students who dislike working together. Whether this is because they don't like each other, don't know each other, or don't know how to collaborate, some of these students simply have not been exposed to enough group work situations throughout their education. When I sat down to analyze my research, though, I found that the movement-based activities actually brought many of the children together and fostered positive collaborative experiences.

Every activity done during my research study had the students working together in some way, but this was not my original intention. I did not consciously base all of my lessons around group work, but it somehow evolved into that once I began to see some interesting relationships develop within my class. For instance, Prisca, an extremely reserved girl who recently moved to East Greenwich, began to develop a friendship with Raquel after they were put into the same compass exploration group. I caught on tape Prisca explaining to Raquel how to use the compass:

Prisca: "Hold it this way. See? So that you see the arrow right in front of you. And now turn your body this way (actually turns Raquel's body), but keep the needle pointing north."

Raquel: "Oh ok! Let me try now and you watch."

Raquel later wrote, "I liked this aktivity (activity) because you get to move around and anterack (interact) with other people." It seems as though when they were given the opportunity to work together during the kinesthetic activity, these two girls found that they had a lot in common and could be friends. In addition to Prisca and Raquel, I noticed that Dustin and Kyle, who normally bicker about petty issues, actually enjoyed the movement activities so much that they seemed to have forgotten their differences. I even observed Dustin asking Kyle, "Do you want to sit by me at lunch?" I was actually shocked when I heard this because I was so accustomed to Dustin picking on Kyle, Kyle tattling on Dustin, Dustin tattling on Kyle, etc. It was never-ending, that is until they were group together in several of the movement-based lessons. In his reflection Dustin even wrote, "I liked the groups cause it is a funer way to learn and to be corwaperwative in a group."

I even noticed that a relationship formed between Sam, one of the smartest boys in the class, and Danny, the child classified as having a Specific Learning Disability. In the beginning, Sam was randomly grouped with Danny, and I observed how he took Danny under his wing to make sure that he felt comfortable. He would often re-explain directions, help him spell longer words, and talked to him like he would any other student. Sam didn't do any of this because I asked him to, but they actually became friends during my lessons. I was so pleased that Danny finally felt comfortable with one of the students in the class, that his work ethic improved, and that he rarely had any emotional meltdowns. These activities were not only beneficial to Danny because he is primarily a tactile and kinesthetic learner, but they also helped him to improve his socializing skills.

As for the rest of the class, the kinesthetic lessons proved to be extremely effective in creating a positive learning community. After being asked to work together during a lesson, I noticed that the children were more cordial to one another and did not complain about working with people who were not necessarily their "best friends." Many wrote comments in their written feedbacks showing how they liked that these activities created a more collaborative environment. Some examples of these include:

Danny: "I really had fun because we all had a part in it (the mapping the routes lesson) and we got up and moved around."

Mitch: "Today's prefix lesson was fun because we got to work in groups and I like being with other kids."

Sarah: "It (the fact matching activity) let us stretch and it let us communicate with our classmates."

Pushti: "I like that we had groups because the other people help me learn better. The groups are always good."

Summary of Data Analysis

As stated in chapter two, "After all the arguments have been made for one side or the other, it gets down to one thing: Movement is about living and living is about learning" (Eric Jensen, 2000, p. i). After conducting this research study and analyzing my results, I could not agree with this statement more. Based on all of my data sources, I have come to realize that kinesthetics can certainly play an important role in the classroom curriculum. Although it is not the only mode of learning that should be implemented in schools, it is definitely one that has the ability to reach the bodies and minds of young children. In my specific study, where I used kinesthetic-based activities to guide my lesson plans, I found that the children were impacted by this type of learning. It helped to increase their understanding of the topics being taught and even lead to many of them making personal connections to their learning. This form of learning also effectively engaged my students in academic content that could have otherwise been mundane and useless. The children's motivation to learn lead to their understanding of academic concepts. Likewise, their understanding of a concept lead to increased motivation to learn. Movement-based learning in this study also helped to foster collaboration among the students; relationships that might not have otherwise been created actually developed. Through trial and error, kinesthetics became a normal, everyday part of our classroom. My research showed that with clear directions, consistent rules, and constant supervision, kinesthetics can be implemented into any classroom.

CHAPTER V

Summary, Conclusions, and Implications

Restatement of Findings

As discussed in chapter four, I have come to find that the use of movement and kinesthetic learning can help to enhance the classroom curriculum if used in an effective and academic manner. Without a clear behavior management plan and well-rehearsed transitional cues, a classroom full of young students moving around the room can become chaotic and counterproductive. I quickly learned, though, that providing my students with clear directions and rules for participating in kinesthetic activities helped them to realize that, although fun, these assignments were to be taken seriously. After looking through my teacher research journal, student feedback, individual interviews, and videotaped lessons, I found that the kinesthetic learning had an impact on my fourth grade classroom. I discovered that this type of learning led to increased understanding of the topics being taught because many of the children were able to make more personal connections to their learning. When students are able to make connections to the world around them, deep and meaningful learning is taking place. I also found that with increased understanding came a connection between movement and student engagement. When the students in my class were interested in the lessons and activities in which they were participating, they were more likely to understand the content. Many of the children complained of being bored during "regular" lessons, but, in contrast, the kinesthetic activities got them out of their chairs, interacting with the situations, issues, and topics

being presented in their textbooks. It also became apparent that the kinesthetic activities helped to foster positive collaborative experiences because the children learned how to work with their peers to complete academic tasks. New relationships within the class even began to develop as a result of students being placed in groups with people that were not necessarily their best friends. Overall, I found that the use of movement in the classroom resulted in a positive experience for both me and my students.

Conclusions

Based on my findings and the work of others in the field of education, I learned a great deal about the role that movement can play within the classroom community. It is a mode of learning that should not be limited to the gymnasium or the playground because of the benefits it can provide for students' bodies and minds.

Although I could not actually study the brains of my fourth graders, the evidence I collected concerning their increased understanding of topics through the use of the kinesthetic curriculum affirms what many researchers have stated about movement and the mind. Jensen (1998) described how movement and exercise not only strengthen the muscles in the body, but also different parts of the brain such as the basal ganglia, cerebellum, and the corpus callosum. Movement has also been shown to strengthen the neural networks within the brain, increasing the chance of the information actually sticking in our heads. Many teachers, though, only use words and visual representations to teach concepts in subject areas. Unfortunately, this type of learning only uses a fraction of the neural networks in the brain (Greenfield, 2008). The motor systems, on the other hand, occupy a larger portion of our brain and "include some of the most evolutionarily advanced systems" (Greenfield, 2008, p. 36). By actively engaging the motor systems of

the brain, the concepts of a lesson are more deeply represented. Through the use of kinesthetics in my classroom, I noticed that students were able to recall information weeks after it was taught. The cells, tissues, organs, and body systems "dance" stuck with my students even after our unit on body systems was completed because of the connections it helped to make within their brains.

According to Westerhold (1998), "kinesthetic curriculum helps make cognitive connections real and puts undermotivated learners into motion" (p. 18). I actually saw this quote come to life right before my eyes as I documented countless learners within my classroom who were engaged in lessons and subsequently became more motivated workers. Even if those students do not remember everything they learned about New Jersey history, I hope that they will unknowingly become more interested in learning, in being an active participant, and in becoming a better listener. My work not only lead to greater understanding of concepts, but it also seems to have helped create better learners. If students are excited about a kinesthetic lesson in social studies, for example, I have come to find that they will then be more excited to see what the teacher has planned for science, language arts, and math. I hope that my children's excitement over the movement-based lessons will be generalized to other learning experiences.

Additionally, my research is not just about the impact that kinesthetics can specifically have on students, but is more significantly about the importance of incorporating different types of activities into lessons to meet the needs of all learners. Not all children are linguistic, logical, or mathematical learners, yet the educational world seems to favor these types of students. Understanding one's class in terms of interests, strengths, and weaknesses is vital to the overall success of a learning community.

Gardner (1993) maintains, through his theory of multiple intelligences, that there are many different types of "intelligences" that people can exhibit and that it is important for teachers to take all of them into consideration when educating children. In fact, students can easily have a combination of intelligences that work together to make them a very specific type of learner. My research helps to make Gardner's theory more tangible in the sense that I noticed real students, who had very real and very differing needs, try their best to learn. To those who were not linguistic learners, kinesthetics came as a pleasant relief. Those who excelled in reading and writing tended to have more difficulty grasping concepts through movement. Either way, my research taught me the importance of utilizing the ideas of Gardner to make lessons that meet the needs of all students. Although I stress the impact that kinesthetics can have in the classroom, I strongly feel that my work also provides a soap box for other modes of teaching, including the use of music, tactile activities, and drama within the classroom. These exciting forms of teaching can and should be used in all classrooms to enhance curriculum and create more motivated learners. Showing other teachers the excitement that they can build in their students when they think outside of the box and really understand their students' needs is the message that I hope to convey with this research project.

Implications for the Field

With the recent increased emphasis on standardized test taking across the United States, it often seems as though teachers lose what is important when educating children. I fully understand the purposes of these tests and the reasons why schools want their pupils to do well, but I do not understand why these tests have to overtake classrooms. It is difficult for me to believe that any teacher joined this profession to cram as much

information as possible into the heads of their students, using as many worksheets as possible, so that they may or may not do well on a standardized test. Of course we all want our students to do well on these tests, but it seems as though teachers are forgetting that worksheets, lectures, and notes are not the most effective ways to help students learn.

In my experiences during student teaching, practicum, observations, and summer jobs, it seems as though many teachers forget that without the motivation to learn, a large number of students simply chose not to. Although I wish that all students could be intrinsically motivated to learn for the sake of learning, the reality is that most students need to be given something to make them want to be educated. They need something to help them feel engaged and they need something to help them feel personally connected to their own learning. The use of movement and kinesthetic learning can and should be that something.

Using my research and the kinesthetic activities that I created across the curriculum, teachers can enhance their classroom and hopefully, in turn, create a more positive learning environment. I hope that teachers will be more inclined to take a close look at the learning styles of their students and base their lessons on the needs of these students. Each year, teachers are given a new set of children who have new sets of strengths and weaknesses, likes and dislikes. It is not fair for teachers to teach each class that comes through their doors in the exact same manner. My research will hopefully shed new light on the importance of understanding that children have multiple intelligences and that kinesthetics is an often forgotten mode of teaching that needs to be reintroduced into the classroom routine. The benefits that kinesthetics can have on the body and the brain far outweigh the extra planning that may incur as a result of enhancing

one's curriculum. As shown, kinesthetics can be incorporated into all subject areas to help students stay motivated to learn and to reach the minds of the non- linguistic or - mathematical learners. Of course, this way of teaching should not overtake a curriculum; it should be strategically placed in the form of activities within lessons. Kinesthetics is a significant mode of learning that will hopefully gain more appreciation from the education community as a result of my work.

Suggestions for Further Research

Due to the limited amount of time given to complete this research study and the limitations created by being a student teacher in someone else's classroom, further research must be conducted concerning the use of movement and kinesthetic learning in schools. Although I learned a great deal about how to use movement in the classroom and the affect it can have on one group of children, like any good teacher researcher, I still have questions that have not been answered. I strongly feel that it is the job of a teacher researcher to always be questioning and analyzing one's work. This is the only way that classrooms can be improved and learning can continue.

I still mainly question what this study would look like in a different setting and I wonder if the effects of kinesthetics on the students would differ. My initial thoughts go to students with special needs: what would this research study look like with students with mild, moderate, or even severe disabilities? My experiences with both students with disabilities and students in regular education classrooms have taught me that the same concepts and activities do not necessarily work the same in both settings. If I had done my student teaching placement in a self-contained classroom, students in wheelchairs, walkers, and leg braces, and those with fine or gross motor difficulties, may have not

been able to perform some of the movement activities that I had done with my fourth graders. Further research would need to be completed to see how kinesthetics would impact their learning and the overall flow of the classroom learning community. Would the classroom structure need to be changed? Would the students' self-esteem decrease if they had to use modified movements because of their disabilities? Would this mode of teaching be accepted by parents? Similarly, I wonder how this research study would work with younger students. Would behavior be more of an issue because of their age? Would the teaching strategies I used in this research study need to be adjusted? The kinesthetic learning worked well with my class because my students knew I had to do it for a "project," but how would it have worked if I had done it with a class that was not as willing to try new things or as open to participate in class activities?

I also strongly feel that further research needs to be done concerning the use of kinesthetics to teach academics in special subject areas, such as library, art, music, and computers. In my research I saw a limited number of articles concerning the use of movement in these areas. I wonder what could be done kinesthetically in these classrooms to hopefully increase motivation and understanding. Although I am not trained in any of these special subject areas, I do plan on continuing to incorporate kinesthetics into my future classroom in hopes of increasing my ability to create meaningful and engaging lessons for my students.

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