# Program Evaluation of Jacob's Pillows Curriculum in Motion (JP-CIM) Program Residency: The Effects of Utilizing a Kinesthetic Instructional Program & Students Perceived Multiple Intelligence Strengths on Academic Motivation, Academic Self-Efficacy, & Executive Functioning

by

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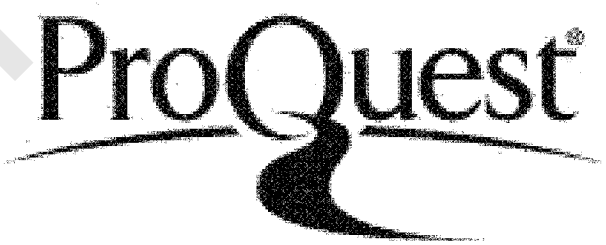

**PSY.D PROJECT FINAL APPROVAL FORM**

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I can do all things through Christ who strengthens me – Philippians 4:13

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## ABSTRACT

Skoning (2010) stated that special and general education teachers are challenged to effectively meet the academic needs of their students. No matter how frequently class materials are read, discussed, and reviewed, some students do not understand the information or remember it when asked to recall information later. Literature has shown that there is a connection between kinesthetic movement, executive functioning and academic achievement. Brain based learning and multiple intelligence theories depict how individuals take in, retain and learn information. Theorist postulate that academic motivation combined with academic self-efficacy can improve academic achievement. (Caine & Caine, 1991; Campbell & Campbell, 1999).

The researcher conducted a quasi-experimental study that aimed to investigate the effects of the Jacob's Pillow Curriculum in Motion Program (a kinesthetic/dance movement program) on the academic motivation, academic self-efficacy, and executive functioning of high school students. Furthermore, this study explored how students self-identified multiple intelligence abilities impacted the relationship between JP-CIM and the outcome variables. The participants in the study were 86 students who attended a public high school in Berkshire County Massachusetts. The intervention group consisted of 37 students and the control group consisted of 49 students. Quantitative results indicated that although there were some changes in the student scores on the outcome variables from time 1 to time 2, the two groups did not differ significantly. Results also revealed that there was no significant difference on the outcome variables of the students who had perceived high and perceived low kinesthetic intelligence. Although there were no statistically significant findings, further examination of the results revealed general

trends and patterns of scores amongst the participants. Patterns of scores indicated that the JP-CIM student participant's scores on self-esteem, self-regulation, and emotional control, increased more than their counterparts. Trends also revealed that students with perceived low kinesthetic strength portrayed an overall pattern of improvement on all three of the variables compared to the students with perceived high kinesthetic strength.

The results are considered in regard to the current knowledge and research of kinesthetic/dance programs and perceived multiple intelligence strengths, on student learning, as well as, their social-emotional and executive functioning skills. Limitations and future directions are discussed.

# CHAPTER I

## INTRODUCTION

As we progress into the 21st Century, it is becoming more common for general and special education teachers to explore non-traditional ways of disseminating academic information to their students. Technology and "hands on" activities, have been incorporated into lessons, and have been shown to be helpful in engaging students in the classroom (Jenson, 2008). Winner (2000) stated that the relationship between the arts and academic achievement in core academic disciplines (i.e., language arts, science, mathematics, and social studies) has been a highly debatable topic. Past research has explored numerous theoretical concepts regarding: how the brain obtains and transmits information; different types of learning (i.e., visual, auditory…etc); movement and the brain; social-emotional concepts; and executive functioning. Although the aforementioned techniques have been proven to be beneficial, and the concepts have been widely examined in a mutually exclusive capacity, little is known about the effects of kinesthetic/dance movement in regards to the mind-body connection and it's transference of information for learning academic concepts and skills that foster academic success (Campbell & Campbell, 1999; Jenson, 2000).

The primary purpose of the current study was to examine the effects of Jacobs Pillow Curriculum in Motion program residency and perceived students multiple intelligence strengths on academic motivation, academic self-efficacy, and executive functioning. It also examined the effects of the JP-CIM program residency on the aforementioned constructs for the student classes that participated in the JP-CIM program

residency (intervention group), and compared those results to the students in the classes that did not participate in the program residency (control group). The current research study explored the link between the mind-body connection and multiple intelligence strengths as they pertain to important aspects of academic success, executive, and social-emotional functioning. The current study builds upon the current research of this topic as related to high-school students learning academic subjects such as: Physics, Gym/health, Social Studies, and Pre-K teachers program.

# CHAPTER II

# LITERATURE REVIEW

This chapter consists of a review of the literature that pertains to concepts such as: the mind-body/movement connection, the methods and neuropsychology of learning information, as well as, social-emotional and cognitive aspects of academic achievement. The effects of current program development techniques and creative movement/kinesthetic based programs are also discussed in light of the previously mentioned theoretical concepts and their integrated effect on academic success.

## Gardner's Multiple Intelligence Theory (MI) Theory

Howard Gardner's theory of an individual having and using multiple intelligence strengths to increase learning and functioning has been a widely known and controversial topic. According to Gardner's book, *Frames of Mind* (1985, 1993), there are seven intellectual domains that indicate a person's intelligence. The seven intellectual domains are: Linguistic, Logical-mathematical, Spatial, Musical, Kinesthetic, Interpersonal, and Intrapersonal. In 1996, Howard Gardner added Naturalist intelligence to his list, making it the eighth intelligence category. Gardner's theory suggested that there are different degrees/ levels of multiple intelligences that an individual possesses, and these degrees are not fixed or finite in nature (Armstrong, 2009). It is postulated that that experience and exposure to many different activities and situations allow individuals to develop strengths in different areas and multiple intelligence domains. These strengths can be used to improve weaknesses in other facets of multiple intelligence, areas of functioning, learning, and interacting with others (Castellani, 2005).

Gardner (1999) expressed his concern regarding schools and educators not meeting the learning and academic needs of their students. He stated that school systems frequently evaluate students' performance on standardized test scores which only assesses two multiple intelligence domains (logical-mathematical and linguistic). He stated that since schools mainly focus on these two multiple intelligence domains, those students who do not perform well in those areas of functioning do not do well in school, become frustrated, and are considered to be "slow learners" (Gardner, 1999). Rather than use the multiple intelligences to "stero-type or track students" (Gardner, 1999), they should be utilized as entry points to understand student learning, the brain, and ways to introduce concepts. Gardner (1999) posited that students would have more academic success if learning were taught in ways that develop and strengthen all intelligences. Since multiple intelligences were developed from the arts, then teaching concepts and information through using multiple intelligences is analogous to teaching through the arts (Gardner, 1999).

**Brain Based Learning (BBL)**

Brain Based Learning (BBL) theory has been studied by theorist for years. Siemens (2003) stated,

> Our brain is an organ. It functions best under certain types of conditions. When these required conditions are reflected in the learning process (which should be incorporated during design, development, and teaching stages), the brain is much more efficient...and as a result, we learn more (p. 2).

Caine and Caine (1991) developed 12 principles of BBL that describe the relationships between the functions of the brain (i.e., thinking, processing information,

memory/learning, and emotional regulation), the physiology of the body, and the learning process. Those 12 Brain-Mind principles are as follows: (1) The brain is a parallel processor; (2) All learning is physiological; (3) The search for meaning is innate; (4) The search for meaning occurs through patterning; (5) Emotions are critical to patterning; (6) The brain-mind processes parts and wholes simultaneously; (7) Learning involves both focused attention and peripheral perception; (8) Learning always involves conscious and unconscious processes; (9) There are at least two approaches to memory, a set of systems for learning and a spatial memory system; (10) Optimal learning occurs when facts and skills are entrenched in spatial memory; (11) Complex learning is enhanced by challenge and inhibited by threat associated with helplessness; and (12) Each brain is uniquely organized. It is believed that these concepts and principles are interrelated.

According the Jenson and Jenson (2008) BBL strategies take into consideration what is known about the brain and tailors instructional methods around that knowledge to enhance learning. Jenson and Jenson said that Brain Based Learning/education can be defined in three words, "engagement, strategies, and principles" (2008, p.6). He posited that educators should engage learners by using strategies that are based on real science (Jenson, 2008). Similar to Caine and Caine (1991), Jenson and Jenson (2008) stated that there are important Brain Based Learning principles that should be considered when constructing activities/lessons for transferring and acquiring information. The ten principles are as follows: (1) Physical education and movement are crucial to learning; (2) Social experiences/conditions become encoded in the brain through our sense of acceptance, pain, stress, confidence, reward, and coherence; (3) The brain is highly malleable and changes/develops daily as it revamps itself through neuroplasticity; (4)

Chronic and acute stress is not conducive to learning and behavior management. When stressed, the amygdala (the part of the brain that controls emotions, emotional behavior, and motivation) responds to stress by blocking information from the centers of the brain; (5) Brain research supports the notion that there are more differences than similarities in the way individuals learn. Therefore diversity in talents, interests, and abilities should be celebrated; (6) Chunking information into 2 to 4 sections is most beneficial. The hippocampus (place in the brain that stores short-term memories) is limited in the amount of information it can hold, and overloads quickly depending on an individuals' brain and the complexity of information being stored; (7) Arts are good for the brain as certain arts increase working memory, visual spatial skills, and attention; (8) The emotional states that are most conducive for learning are: curiosity, suspicion, anticipation, and confusion; (9) Aggressive behavioral therapies, stem cell implantation, and new developed drugs remediate and normalize brain-based disorders; and (10) Memories are malleable and should be strengthened over time.

Methods in using BBL Theory to enhance skills and advance learning are slowly developing. Harvard University's School of Education, amongst other universities has developed master's and doctoral programs in "Mind, Brain and Education" to connect the fields of educational practice, cognitive science, and neuroscience. These programs have been specifically designed to further the research in Brain based learning/education and develop applicable interventions to incorporate into academic program development.

**Research Based on the Integration of MI and BBL**

Marzano's (1992) "Dimensions of Learning Model" discussed 5 ways the mind operates during the learning process. This theory combined aspects of both BBL theory and MI theory to provide interventions for learning. The 5 "dimensions" in this theoretical model are: (1) positive attitudes (2) acquiring and integrating brain knowledge, (3) extending and refining knowledge, (4) using knowledge meaningfully, and (5) habits of mind. According to Hardiman (2001) there is a correlation between cognition and emotion, in that positive attitudes are needed to facilitate the learning process. Neuroscience supported this statement and indicated that neural pathways in the brain connect to the limbic system (area of the brain associated with emotion) and then to the frontal lobe (area associated with learning). Numerous interventions such as drama, art, humor, movement, or arts integration in general stimulate the limbic system of the brain and elicit long-term memory, directly connecting emotions to learning (Hardiman, 2001).

Acquiring and integrating brain knowledge refers to ways in which the brain obtains, stores, and utilizes information (Valiant, 1998). Buchel, Coull, and Friston (1999) explained that learning occurs due to a neural connectivity and communication between nearby cells in the brain. The more often this occurs, the more a task or a memory acquires automaticity and has a high likelihood of being stored in long term memory. It is suggested that since the right brains visual-spatial skills can be stimulated and utilized to interpret graphs and, math symbols then art, movement, and music should be integrated with academic activities to increase learning. Brandt (2000) provided an example of this when he suggested that students can learn how the earth tilts, rotates, and

develops seasons through body movements. A student can tilt their body toward the center of a circle to simulate the season of spring and turn and tilt their body away from the center to simulate the season of fall. The next dimension requires a deeper analytical analysis of a concept where an individual will deduce and induce thoughts/ideas, apply abstract thinking, and classify a concept (Marzano, 1992). This requires the brain to utilize involved systems of retrieval and integration of information to produce higher level thinking and complex thought (Lowery, 1998). Brandt (2000) stated that brain research supports thinking-skills programs that have student's compare and classify familiar concepts. In this case, neurons fire at the same time increasing learning and associations within learning such that less energy is used when performing familiar functions than novel skills. Teachers can employ experimental learning and movement techniques that require students to investigate, use reasoning skills, and make decisions (Sousa, 1998). Similar to Gardner's theory of multiple intelligence learning, Sousa (1998), suggested that students should use numerous ways to demonstrate learning (i.e., visual display, interventions, oral presentations, music). Gullatt (2007) stated that learning through the arts (dance, musical, dramatic, and visual arts) allows students to explore multiple ways to construct meaning from content-related material, as well as, become more adept at employing high-order thinking skills to become more independent learners. Lastly students should be encouraged and required to facilitate their own learning and exhibit "Habits of Mind" where students continuously utilize critical thinking skills. More specifically, the students would express learning through components of executive functioning skills (i.e., metacognitive thinking), self-efficacy (i.e., maintaining one's own standards of evaluation and capabilities), motivation (i.e.,

goal setting and putting forth the effort to achieve the goal), and their multiple intelligence strengths (i.e., applying an individuals' unique learning style to future learning experiences) (Sousa, 1998).

Results from brain-mapping technology studies indicated that individual differences in brain structure and organization relate to different types of learning styles. Learning styles affect an individual's memory and word retrieval process. Kruk and Willows (2001) conducted a study that examined the difference between students with reading disabilities and age-typical readers when asked to perform visual-perceptual tasks. The results of the study found that the visual processing speed of students with reading disabilities was significantly different than those of students without reading disabilities. This study illustrated the interrelatedness of learning styles/multiple intelligence strengths and methods of processing information. It also supported the need for including multimodal interventions in program development strategies to improve academic achievement. This can be exhibited in the form of metacognitive reflections (i.e., reflection journals, or thinking logs, cooperative learning settings, group discussions).

**Program Development and Integration of MI and BBL**

MI and BBL concepts have become invaluable components in program development, academic instruction, and artistic portrayal of concrete concepts. Schools that have used multiple intelligence theory as the foundation of teaching interventions reported that the academic achievement amongst its students improved, narrowing the achievement gap between successful and struggling students. Programs that have integrated MI and BBL found that individuals of all ages developed abstract meaning to

concrete information that assisted in memory and learning (Campbell & Campbell, 1999).

Winner and Hetland (2000) conducted a study at Harvard University called "Reviewing Education and the Arts Project (REAP)." This study examined documents (e.g., reports, books, unpublished papers, and data) that explored the relationship between academic achievement and the arts. The researchers conducted 10 meta-analyses on the documents. The results rendered that there were links between dramatic reenactments and dance with academic outcomes. More specifically, the results found that verbal skills facilitated by dramatic reenactments transferred to new material. The results also found that dance enhances non-verbal skills.

A study that examined the effects of an academic music intervention on the comprehension of mathematical concepts (i.e., fraction symbols, fraction size, and equivalency) and music notation rendered effective results of the music intervention. Students who had less fraction knowledge at the beginning of the study responded well to the musical intervention and, their post-test scores indicated that they performed similarly to their high achieving peers (Courey, Balogh, Siker, & Paik, 2012).

School districts such as the Prince William County, Virginia public schools reported extreme success and progress when using the Action Based Learning Lab with academically struggling first grade students (Kuczala, 2010). The Linewood A+ "Arts plus Academics" Elementary School in St Paul, Minnesota, had an "art-infused" school wide curriculum as a way of focusing on the different learning styles and multiple intelligence needs of their students. The curriculum model consisted of the school

offering classes in at least 4 areas of art (i.e., art, music, drama, and dance), and that each student had a daily meeting with an art specialist (Mohn, 2004).

The Tucson Unified school District in Tucson, Arizona used a multimodal approach of integrating the arts (e.g., music, dance, art) in its district wide curriculum as a way of increasing academic achievement of its students. This district utilized a program called, "Opening Minds Through the Arts (OMA)," which was created on the basis of aspects of MI theory and BBL research (Smith, 2009). Elementary school students who participated in the OMA program scored higher on standardized state tests in reading, language, and math than the scores of comparison third grade students in other schools (Smith, 2009). According to Smith (2009), the principal of Lyons elementary school in this school district stated, "OMA is different than just having music. It uses the integration of the arts to reinforce concepts that students are learning. It gives them the experience of those concepts through music or movement or art" (p. 1).

**Movement and the Brain (the Mind-Body/Movement Connection)**

Hannaford (1995), a renowned neuropsychologist and educator, stated "Movement is an indispensable part of learning and thinking. Movement anchors thought." (p. 17). Corbin (2008) stated, "Movement has shown to be the one thing that tends to engage all learners and activate both sides of the brain" and suggested that "movement provides critical emotional engagement necessary for motivation and attention" (p. 68). Movement can be considered to be a "physical language," that disseminates emotional, cognitive, and motoric information. This information is collectively stored in the brain in order to provide a basis for multiple associations and contexts for learning (Jensen, 2000).