Brain-Based Learning and Multiple Intelligences As Related to Creative Dance Activities

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The purpose of this article is to present connections between Howard Gardner's (1983) Multiple Intelligences (MI) theory, brain-based research, and how one can apply this information in teaching and learning creative dance. While dance is the art form focused on by this article, many of the components discussed can be applied to drama, music, visual arts, other art forms, and physical education.

Part One provides a brief discussion of Howard Gardner and his Theory of Multiple Intelligences along with definitions for each intelligence. Part Two presents ideas concerning dance education and its connection with MI theory and Brain-Based Learning. The implications of a brain compatible approach to dance are discussed. Part Three focuses on practical applications of Brain-Based Learning and MI to creative dance activities described in Lloyd's book, *Adventures in Creative Movement Activities: A Guide for Teaching*. Each intelligence is discussed in relationship to the four parts of the lesson. Examples are provided in which local practitioners (in both Malaysia and the United States) have adapted lessons from Lloyd's book.

Part One: Howard Gardner's Theory of Multiple Intelligences

In 1983, Howard Gardner, an American educator and professor at Harvard University wrote *Frames of Mind*. In this book, he discusses the development of his theory that human beings possess more than one intelligence.

Initially, Gardner (1983) defined intelligence as "the ability or set of abilities that allows a person to solve problems or to create products that are valued within one or more cultural settings" (p. 60-61). Twenty years later, Gardner (1999) conceptualized intelligence as "a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (pp. 33-34). Gardner views his intelligences as "potentials—presumably, neural ones—that will or will not be activated, depending upon the values of a particular culture, the opportunities available in the culture, and the personal decisions made by individuals and /or their families, schoolteachers, and others" (Gardner 1999: 34).

In 1983, Gardner listed seven intelligences that included: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, and the personal intelligences that involved interpersonal and intrapersonal. By 1999 in *Intelligence Reframed*, Gardner had added two more intelligences to his list: the naturalist and spiritual (existential).

- *Gardner's (1999) definition of each intelligence appears as follows: Linguistic intelligence "involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals" (p. 41). This intelligence includes the ability to effectively use language to express*

oneself rhetorically or poetically; and to use language as a means to remember information.

- *Logical-mathematical intelligence "consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically" (p. 42).*

- *Spatial intelligence features the potential to recognize and manipulate the patterns of wide space . . . and more confined areas" (p. 42).*

- *Bodily-kinesthetic intelligence entails the potential of using one's whole body or parts of the body to solve problems. The use of mental abilities to coordinate bodily movements is one component. Gardner sees mental and physical activity being related.*

- *Musical intelligence "entails skill in the performance, composition, and appreciation of musical patterns" (p. 42). It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms.*

- *Interpersonal intelligence is concerned with "a person's capacity to understand the intentions, motivations and desires of other people. . . to work effectively with others" (p. 43).*

- *Intrapersonal intelligence "involves the capacity to understand oneself, to have an effective working model of oneself—including one's own desires, fears, and capacities—and to use such information in regulating one's own life" (p. 43).*

- *Naturalist intelligence enables human beings to observe, recognize, categorize, and draw upon certain features of the environment.*

- *Spiritual intelligence (or existential intelligence) seeks to understand the realms of experience or existence that include exploring the meaning of life, understanding death, and spirituality beyond the physical domain.*

Gardner's MI Theory has had a profound impact on practice and thinking in education. His work has influenced the theory and practice of all educators, including dance educators, who have studied his philosophy. This theory provides a major theoretical foundation for creative dance theory; but other theories also exist which provide additional rationales for promoting creative movement in a learning setting.

The next section contributes to this idea through the presentation of Brain-Based Learning, which shows several dramatic connections between what is accomplished through dance activities and cognitive development. It will support Gardner's beliefs as presented in this first part, and Lloyd's beliefs, which are presented in Part Three.

Part Two: Dance Education and Brain-Based Learning

The subject of this inquiry is an exploration of the benefits of dance/movement education. The goal in movement education through dance is to provide students with a comprehensive movement education program; one that goes beyond "skills and drills" in game playing and allows for "mastery of movement concepts with artistry of expression … and acquisition of dance skills" (Gilbert 1992: 3). This method of movement education could also bring movement experiences into the classroom to integrate movement with the academic subjects being taught.

Learning through dance education is the means through which a movement education program might become more comprehensive in its scope and provide outcomes not only in the physical domain but also in the cognitive, affective, and social domains as well. Dance/movement education and its use as an instrument in connecting with our kinesthetic selves may be the tool required to establish strong body-mind connections and contribute to the many ways of human learning and knowing.

The first part of this inquiry will reveal three areas in which dance/movement education can impact our somatic intelligence: Physical Education, Arts Education, and Kinesthetic Learning. The task is to establish the importance for providing movement education, arts education, and kinesthetic learning experiences for students through a specifically developed dance/movement curriculum.

Dance as Physical Education

In the realm of physical education, dance education can give a new understanding to movement potentials for individuals; of body limits and capabilities and of the physical realities of the body. Dance introduces a wide variety of movement vocabulary to be explored, new concepts in body exercise, and movement that engages mental activities to enhance body/mind connectedness.

Skilled use of the body through artistic and athletic activities coupled with an intelligent, inventive mind constitutes the perfect harmony that was sought during the Classical Era of the Greeks. "They sought a harmony between mind and body, with the mind trained to use the body properly, and the body trained to respond to the expressive powers of the mind" (Gardner 1983: 207).

Motion is an innate part of our human existence and essential to our lifetime development as we gain knowledge by physically exploring and discovering our world, using movement as a vehicle of learning. We use movement to develop our ability to move by strengthening our muscles, increasing our flexibility and range of motion and refining our motor skills. Schrader offers the following in *A Sense of Dance: Exploring Your Movement Potential:*

> The motivation to move is a natural, instinctive response to all of the forces which act on our bodies. We are always moving. In order to resist the pull of gravity and move about the earth, your muscles must work to keep you in an upright position... movement is a measure of life (Schrader 1996: 12).

Dance as Art Education

As an art form, dance is a deliberate activity that involves purpose and intent, creative expression through movement, and a development of aesthetic appreciation. It explores the realm of noetic cognition. Noetic cognition involves knowledge that comes directly as experiential cognition. Artistic or intuitive ways of knowing, because of their large subjective content, have been considered an unreliable means of gaining knowledge of the objective world and are presumed to not concede to the processes of logical deductive systems and the analytical tools of science. In *Education and Mind in the Knowledge Age,* Bereiter describes the debate between ways of knowing as "one of the most vigorously disputed issues in contemporary thought" (Bereiter 2002: 78). He poses the question: "Does science have a privileged claim on our belief or is it only one among the number of ways that different peoples have tried to make sense of the world?" (Bereiter 2002: 78). Stanfield contributes to this discussion by asserting that: "Modes of social knowledge such as theology, science, and magic are different, not inferior or superior" (Stanfield 1985: 392).

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Knowledge is only partially a matter of facts and demonstrations. The analytic, deductive way of knowing has its polar opposite; the noetic, as stated earlier, is knowledge that comes directly as experiential cognition. Edgar Mitchell, the U.S. Apollo astronaut, "who was a paradigmatic example of the very pinnacle of pragmatic, empirical training, and whose life depended on the validity of scientific principles and technological knowledge" (Rheingold 1988: 129) describes his noetic experience upon seeing the Earth as he floated in space during a space walk on return from the moon:

> The first thing that came to mind as I looked at Earth was its incredible beauty. Even the spectacular photographs do not do it justice. It was a majestic sight—a splendid blue and white jewel suspended against a velvet black sky. How peacefully, how harmoniously, how marvelously it seemed to fit into the evolutionary pattern by which the universe is maintained. In a peak experience, the presence of divinity became almost palpable and I knew that life in the universe was not just an accident based on random processes. This knowledge came to me directly— noetically. It was not a matter of discursive reasoning or logical abstraction. It was an experiential cognition. It was knowledge gained through private subjective awareness, but it was—and still is—every bit as real as the objective data upon which, say, the navigational program or the communications system were based.

Dance as Kinesthetic Learning

As a tool in kinesthetic learning, dance can be utilized to enhance learning in other disciplines by creating a multi-sensory learning environment and bringing the medium of movement to the learning experience.

Suppose for an instance that the basis of human thinking and knowing is rooted in the tactile-kinesthetic body and not in the objective mind; that "tactility and kinesthesia are modes of

knowing the world because they are our fundamental ways of experiencing it" (Lemmen 1994: 1). This idea could provide a new perspective in cognitive science and provide for a turn toward the corporeal (the body) in terms of knowing and understanding. What would it take to connect to a notion of knowing through our bodies as well as our minds? The general emphasis on logical/deductive understandings has overshadowed other ways that humans may come to know things. The implication here is that the corporeal connection has been denied, ignored, and possibly severed in most of our practiced theories of learning and now some re-integration is required to restore and utilize it.

In our youth, we are eager to move. We feel at ease exploring the unique instrument that our body is as we run, jump, spin, imitate, and explore all the potentials we have for using our bodies. As we age, the focus of our education and our existence transfers from the bodily-kinesthetic realm to the use of our rational minds to discern and gain knowledge of our world. Our bodily-kinesthetic intelligence tends to decline from non-use. This focus on the rational mind, to the detriment of other intelligent systems that we might possess is, in part, due to Western Culture traditions that emphasize the truth-seeking functions of science and logical deductive systems as the only reliable means of gaining knowledge about the world. The whole educational philosophy rests on the notion of intelligence residing in this one realm of mind based on formal analytic processes, while other ways of knowing and thinking have been considered unreliable means of gaining knowledge of the objective world.

The recent cultural tradition distinguishes between "the activities of reasoning on one hand, and the activities of the manifestly physical part of our nature, as epitomized by our bodies, on the other" (Gardner 1983: 208). This separation of the "mental" and the "physical" can be coupled with the idea that "what we do with our bodies is somewhat 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" (p. 208).

In this light, Lazear (1998) claims "bodily/kinesthetic intelligence is probably the most taken-for-granted part of our lives" (Lazear 1998: 2). He asserts that we, as human beings, do possess a great capacity of establishing a strong mind-body connection by strengthening our bodily/kinesthetic intelligence. "Expanding awareness through the body is the capacity of learning to listen to and trust the body" (p. 1). Lazear emphasizes that MI (multiple intelligences) research has revealed that at any age and at almost any ability level our different intelligences can be strengthened, enhanced, and further developed. The key to empowering the use of bodily/kinesthetic intelligence is practice…and the more you practice the better you get.

The next section of this inquiry will address more specifically three important components of Dance Education: Brain Based Learning Theories Applied to Dance, A Brain Compatible Approach to Dance, and Implications.

The Brain Compatible Approach to Dance

Much of what is practiced in Dance/Movement Education is supported by evidence and theories from Brain-Based Learning research. The current research can support contemporary dance practice and provide an avenue for articulating why these methodologies seem to be effective. Dance Education has been part of an experiential pedagogy referred to as "learning by doing." This approach "is often described as 'process heavy', devoid of content, and a hold out from 1960's progressivists' approaches" (Roberts, 2002: 281). In the article *Beyond Learning By Doing: The Brain Compatible Approach*, Roberts attempts to deepen experiential pedagogy beyond mere "learning by doing" and re-consider the way we currently educate by supporting pedagogy with evidence from current brain research (Roberts, 2002: 281). He calls this the Brain Compatible Approach.

Brain Based Learning Theories Applied to Dance

Many current theories of learning and assertions about human understanding support the notion of the body as key in the development of intelligent beings. "To the same extent that we want active, creative minds for our students, we should also want these minds to be housed in active, creative bodies" (Lloyd 1998: 5).

Brain-Based Learning Theorists have drawn on neurobiology to identify brain function. In this learning theory, learning is defined as "stabilizing through repeated use, certain appropriate and desirable synapses in the brain" (Leamnson 1999: 53). Neurobiologists at the Veteran Affairs Medical Center of Syracuse, New York have identified key brain areas involved in movement and have traced pathways from the cerebellum (the mini-brain vital for carrying out movement skills) back to parts of the brain involved in memory, attention, and spatial perception. Amazingly, the part of the brain that processes movement is the same part of the brain that processes learning (Jensen 2000: 163).

Learning Style Theorists have based their claims on observed behaviors or psychology rather that neurobiology, but their models are very compatible with the (brain-based theorists) understanding of learner differences and uniqueness. This makes them 'compatible' with but not "based" on brain science, but it would be irresponsible to discount the use of these models simply because the data that supports them is psychological and social, rather than biological in nature (Jensen, 2000: 137).

In *Frames of Mind; The Theory of Multiple Intelligences,* Gardner puts forth the notion of Bodily-Kinesthetic Intelligence and describes the use of the body as a form of intelligence. "Characteristic of such an intelligence is the ability to use one's body in highly differentiated and skilled ways, for expressive as well as goal-oriented purposes" (Gardner 1983: 206).

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Of all of the nine intelligences established in Gardner's theory of multiple intelligences, Bodily-Kinesthetic intelligence is probably the least nurtured and least prevalent form of intelligence. The use of the body as an instrument of expression and the comfort we feel exploring our movement potential decreases beginning in adolescence and rapidly declines as we age . . . not because of lack of desire to do so but because of lack of support in our educational system that does not seem to value and nurture this kind of experience as important in learning.

Movement and the expressive use of our bodies is a natural part of our lives and essential to our development. We move to "explore, discover, and interact with the world and its myriad parts" (Rodgers 1996: 4). We use our bodies as instruments to express feeling and we move to develop our ability to move. We use our bodies as vehicles through which we come to know our world. "The living body is more than a device that can make certain discriminations and can move in certain ways. If we are really to acknowledge the mind/body unity, we have to think of the body as an experiencing and experienced body" (Lemmen 1994: 1).

Current investigations and research into theories of learning and conditions of learning support the importance of the brain and body connectedness and support the idea that movement activities are integral to the learning process. Current research shows this link between cognitive function and movement activity. Technological advances in brain imaging have allowed for researchers to see inside the active human brain. Assumptions and discoveries about how the brain learns are being made at an amazing rate. Three such discoveries that have been applied to learning theory examine the concepts of (1) brain patterning, (2) developing the brain's neural pathways, and (3) integrating the brain's separate regions—the Reptilian (or R-complex), the Mammalian (or Limbic), and the Neo-Mammalian (or Neo Cortex) (MacLean 1978).

1. Brain Patterning

Brain research suggests that each and every brain is a uniquely organized system that innately searches for meaning through meaningful organization and categorization of information, or patterning (Caine & Caine 1994).

2. Developing Neural Pathways

Notions of plasticity (ability to continually change) and practice are supported by Brain-Based Learning theorists. Brain cells can be enriched by stimulating the brain with novel, challenging ideas overtime and providing coherent, meaningful feedback during the process. Enrichment of a brain cell leads to "greater spine growth on the dendrites (connection points for cell-to-cell interaction) heavier cell bodies, longer dendrites, and more glial (support) cell growth" (Jensen 2000: 152). Jensen (2000) states that learning is more likely to occur through dynamic experiences and rich, complex, and multisensory environments. Not only can brain cells be enriched but the brain can also grow new cells, a process called neurogenesis. Practice promotes the stabilization of neural connections. Connections, if not stabilized through use, are unstable and will regress easily if not used. Practice indicates to the brain that a useful pathway has been produced. Multi-modal instructional techniques, such as Gardner's (1983) visual, auditory and kinesthetic intelligence activities, can promote and encourage this complex brain processing.

3. Brain Integration

Emotions are critical to enhancing or inhibiting brain patterning or learning. Conditions of learning can affect the chemical and physiological responses one has to situations. Those responses can cause the brain to shift between its "triune" structures (Reptilian, Mammalian,

and Neo Cortex) in order to manage situations. Stress, threats, challenges, boredom, dissonance, are all emotional states that can cause radical shifting within brain structures. Learning can be enhanced by creating conditions where there is balance and integration of these mental modes and the stress/threat reaction is minimized. Brain compatible pedagogy emphasizes novelty, interactive experiences, group decision making, self challenges, and choice; all techniques that address the stress/threat balance.

Based on the above three concepts in brain research applied to learning theory and Jensen's (2000) model of learning, Anne Green Gilbert (1992) offers the following guidelines to ensure Brain-Compatible Dance Education and to approach the teaching of dance with the best practice:

Movement: Integrate movement activities into everyday learning. Optimal learning requires movement that stimulates the vestibular system.
Lots of movement
Movement integrated with written and spoken work

Music: Utilize music in the context of learning.
Use a variety of meters, styles, artists
Use developmentally appropriate compositions

Emotional Engagement: The best thinking is integrated with emotions. Know the emotional state of your learner.
Reflection with self and peers
Create joyful, positive experiences

Meaningful: Make learning relevant for students by discovering personal connections to the material.

Provide developmentally appropriate activities
Connect learning material to life
Understand what and why

Social Interaction: Create a learning environment that is a community.
Physical and verbal interactions – touch and talk
Foster freedom of expression, trust, care
Use a variety of groupings

Nutrition: Talk to learners about good nutrition. Allow for appropriate foods in classroom.
Educate – water, oxygen and protein versus sugar and carbohydrates

Novelty: Unfamiliar activities stimulate the brain.
Gain attention through choices, variety, contrast, changing location in room
Utilize exploration and improvisation
People can only focus on one thing for limited amounts of time depending on their age

Repetition: Repetition establishes strong neural pathways.
Create rituals for low stress learning
Technique and skills part of lesson plan utilizes repetition and building upon of skills
Lesson plan format provides a format for ritual and low stress

Enriched Environment: Rich environments create rich brains; bigger nerve cells with more support cells.
Create multi-sensory learning situations: see, hear, say, do

Explore new environments, novel locations
Create challenges: problem solving, critical thinking, complex ideas
Use positive feedback: be specific, celebrate accomplishments, be timely.

Implications

Body use can improve sheer physical skill through practice but it can also be closely linked to the deployment and engagement of other cognitive powers. Not only does our mind facilitate and control exercise of the body; but also our body can actually stimulate our brainpower. We are wasting learning time by having students sit and listen too much; and we are impairing student learning by the methodologies we use. Building physical activity into all learning situations can stimulate blood flow to the brain to increase synaptic activity; and we can engage communication between parts of the brain by incorporating cross lateral motion which forces the brain to talk to itself. Movement can be offered as a medium in our instructional design to engage the different learning strengths that students might have. Movement can be used as an expressive art form to capitalize on creativity and intuitive reactions to problem solving. Our brains can become smarter and our beings can become more intelligent through movement.

In the next section of this article, the principles of Brain-Based Learning and Gardner's MI Theory have been illustrated with practical applications in Creative Dance Activities.

Part Three: Practical Applications of Brain-Based Learning and MI To Creative Dance

Using the four lesson parts that serve as a basis for *Adventures of Creative Movement Activities* (Lloyd 1998), connections are made between Creative Dance, Brain-Based Learning (how the brain learns best), and MI. A description of how local practitioners (in the US and Malaysia) have adapted lessons from this book concludes the article.

The following Chinese proverb describes the essence of this article:

> "I hear and I forget
> I see and remember
> I do and I understand" (Werner & Burton 1979: 1)

Dance educators, physical educators and arts educators have always understood and practiced the philosophy of learning by doing, and have known that the action of *doing* leads to understanding in a way that hearing and seeing cannot. Werner and Burton (1979) support this belief and practice. They stated that:

> Learning through movement is the oldest teaching method. Among primitive people, one's education consisted of learning how to physically survive. The educational process consisted of parents teaching their children the skills necessary to survive in an environment. In time the pendulum swung from a system that was entirely physical to one that was purely intellectual. Gradually educators have come to realize that intelligence permeates all human activity and that it is inseparably interrelated with emotions, social interaction, and physical activity (p. 1).

In medieval times, the philosophy persisted that the body and mind (soul) were two separate entities. Centuries of research ultimately provided evidence to support the fact that the brain (mind) and body were interdependent; one affected the other. The term "holistic" was coined to indicate that the human body is one whole entity and that healthy operation depends on every part functioning appropriately in concert with all other parts.

Werner and Burton (1979), along with other researchers, have validated what dance educators, including Lloyd, have always known and practiced that dance/movement is the great integrator

of body, mind, and brain. They approach learning in a holistic manner recognizing that the brain, mind, and body stimulate each other and enhance the learning process.

The book, *Adventures in Creative Movement Activities: A Guide for Teaching* was developed as a result of many years of teaching in the US and Malaysia. The book includes a basic format for teaching creative dance lessons; sample detailed lessons for the four elements of dance: body, time, space, and force (or energy); and numerous activities and resources that integrate Brain-Based Learning and the MI into creative dance activities.

Lesson Plan Format

Creative dance units and lessons of today must be carefully planned and organized applying and relating the knowledge presented in research findings of Brain-Based Learning and the MI. Gone are the days when a teacher would distribute a scarf to each student, put on the music, and instruct the students to "dance."

Lloyd uses units (major themes) with several lessons in each unit to develop the theme. Each lesson contains objectives (outcomes), equipment and props needed, activities, and an evaluation for each unit and lesson.

The focus for this section is on the 30-minute lesson plan format that involves four parts: (1) *warm ups* (5 minutes), (2) *movement exploration activities* (5-7 minutes), (3) *the gathering activity* (10-15 minutes), and (4) *relaxation* (5 minutes).

The warm ups and relaxation induce calm states with predictable ritual activities of opening and closing. The movement exploration activities and the gathering activity energize and motivate students, and because of the nature of the creative process, unexpected changes are virtually built in to these lesson parts.

The basic formula for creating movement patterns is shape-movement-shape and is used primarily in the movement exploration and gathering activities as a simple way to begin creating movement patterns that will become dances as they are developed. Lloyd also plans (as other teachers can) novelty with interesting, unique props or surprises with unusual musical or rhythmic accompaniment and/or the challenge of moving in different ways.

A brief description of each lesson part is presented followed by a section discussing each MI with examples of how they can be developed within the lesson parts. While some lesson parts may focus more on developing certain intelligences, all nine of the MI have the potential of being developed in every one of the lesson parts. To avoid excessive duplication, the predominant intelligences are simply listed at the end of each lesson part. Following the completion of the lesson parts, a discussion of each intelligence and its application to these lesson parts is presented.

1. Warm ups

Warm ups prepare the body and mind for moving and use both nonlocomotor and locomotor movements. Nonlocomotor movements (performed on a stationary base) include bending, stretching, twisting, turning, and other movements. Locomotor movements (traveling through space on a moving base) include walking, running, skipping, and leaping along with other traveling movements. Lateral and cross-lateral activities are incorporated into various warm ups that help stimulate both sides of the brain.

Warm ups, an introductory phase, are an extremely important part of the learning process, and having a successful and enjoyable time at the beginning of the creative experience sets the tone for the entire lesson for each individual and the class as a whole. Teachers are responsible for setting this tone and providing positive experiences for the students and themselves.

Some of the warm-up material is also used in movement exploration and further developed in the gathering activity of the lesson. Students are asked to watch for and be aware of which parts of the warm ups will "travel with us through the lesson."

Warm ups definitely focus on the bodily-kinesthetic intelligence. Other intelligences that receive attention include: the spatial, musical, logical-mathematical, linguistic, intrapersonal, and interpersonal. Depending on the activities chosen, the naturalist and spiritual intelligences could be incorporated.

2. Movement Exploration Activities

Movement exploration activities is the second part of the lesson. Through guidance from the teacher, students explore a variety of movements and patterns that express the theme or topic-of-the-day. Lloyd's book contains a wide variety of activities that involve increasing brain activity in cognition, comprehension, and connections to movement. The use of symbols for movement; musical note values; charts with colors; action words; pathway designs; pictures of people; maps of countries; and other visual aids stimulate the brain and body as these aids are used in conjunction with movement activities. The teacher facilitates the exploration by posing questions such as: "How many different ways can you move your arm (leg, torso, head, foot, hand)?" "How fast (or slowly) can you move from one space to another?" Or, the teacher can make suggestions such as: "Show me how you can move at a low (medium, high) level."

"Everyone show me your favorite shape by the time I count three." The students are free to create their own interpretations of movement as long as they move safely around each other and in the environment; the teacher accepts what the students create. Establishing an accepting environment builds student confidence. By asking questions or making suggestions, the

teacher provides an opportunity for students to solve problems, and make choices and decisions about creating their own movements.

Jensen (2000) stated that "Giving the learner[s] more control over their environment is the first step towards boosting confidence" (p. 262). Creative dance activities in Lloyd's book provide participants with a multitude of these opportunities in all four parts of the lesson, thereby enhancing their confidence in not only making movement choices, but actually performing movement/dance phrases that are viewed and appreciated by the teacher and peers.

One of the foundation blocks of creative dance is offering students choices about kinds of movements, speed, direction, alone or with a partner, and other decisions to be made. Every lesson Lloyd teaches involves choices (decisions involving problem solving). The opportunity for student choices are always built in to the movement exploration activities and the gathering activity, and sometimes used in the warm ups and relaxation sections. Giving students choices during the creative dance process builds trust, rapport, confidence, togetherness, and a pride in "owning" the dance that they have created, and this experience also occurs in the next section of the lesson with the "gathering activity."

The movement exploration activities section focuses on the spatial intelligence, but also incorporates the bodily-kinesthetic, musical, logical-mathematical, linguistic, intrapersonal, and interpersonal intelligences. Depending on the activities created, the naturalist and the spiritual intelligences could be a focus also.

3. The Gathering Activity

This part of the lesson is the culminating or peak experience of the lesson as parts from the warm ups and the movement exploration activities are selected and "gathered" into a movement

pattern that contains a beginning, a middle, and an ending. Students make choices concerning selecting shapes and movements, sequencing the movements (which movement should be first, second, and last) and deciding on musical or rhythmical accompaniment.

Once the pattern has been created, the whole group performs it. Then the class is divided into two groups; one group becomes the audience and one group performs. Each group has the opportunity to learn to appreciate and respond appropriately. The audience is attentive and applauds; the performers present their best dance and bow at the end. This activity is referred to as "Show and Share."

There are many ways to extend or expand the dance. It can be repeated in the same order, change the order, repeat one section, or use different choreographic forms as an innovative approach to challenge the dancers. This activity requires the brain to process the information and communicate changes to the body that will then perform the movement pattern.

The gathering activity requires thought and planning on the part of the teacher and the dancers. Students must be able to remember the pattern, work alone or in groups, be aware of all of the elements of dance—body, time, space, and force (energy)—and how these elements are used individually and within the group. A great deal of "brain-work" goes into this culminating part of the lesson. The gathering activity provides "the critical ingredients for enriching the brain . . . novelty, challenge, coherence, time, and feedback" (Jensen, 2000: 153).

The gathering activity focuses on the spatial, logical-mathematical, musical, and interpersonal intelligences as patterns are developed. Of continuing importance in this section are the following intelligences: bodily-kinesthetic, linguistic, intrapersonal, and naturalist. This part of

the lesson plan has the potential for developing the spiritual intelligence because of the culminating experience which allows for further exploration of the movement theme and the opportunity for deeper feelings to be expressed.

4. Relaxation

This is the closing activity of the lesson designed as a "cool down" or a quiet time that serves to refresh the body and the brain through slow stretching and bending, breathing, and a variety of relaxation techniques. A brief review of the lesson is conducted by discussing what activities were done in each part and the sequence that took place. The review keeps the brain active and helps the body remember what movements it performed.

Relaxation provides a place to develop the bodily-kinesthetic and intrapersonal intelligences. Other intelligences that can be involved are: spatial musical, logical-mathematical, linguistic, interpersonal, naturalist, and spiritual.

Relating the Multiple Intelligences to the Lesson Plan Parts

Each intelligence is listed with examples of a few activities that can be used in the various lesson parts.

Bodily-Kinesthetic: This intelligence is clearly used in all of the lesson parts and involves using the whole body and body parts in a multitude of ways for warm ups, to explore movement possibilities, to create culminating movement patterns, and finally to complete the lesson with relaxation movements.

Spatial: This intelligence is used in all lesson parts and provides experiences in learning how to manipulate confined or personal space (the space around a person in a stationary position) and wide spaces or environmental space (the dance studio or room where dance is taking place). A host of spatial activities such as pathways through space, range of movement (near to far), and focus are involved. This intelligence also involves the ability to think in and visualize images and pictures.

Musical Intelligence: Music or rhythmic accompaniment is almost always used in the warm ups, and often in the movement exploration activities, the gathering activity, and relaxation. Singing games and rhythmic movement patterns are a consistent part of Lloyd's lessons. In dance, the element of time contains such musical terms as tempo (fast or slow), beat (like a heart beat), accent (additional emphasis placed on one musical note, or one movement), duration (short or long), and the rhythmic pattern (a succession sounds or movements) (Lloyd 1998: 81).

Logical-Mathematical Intelligence: Components of the logical-mathematical intelligence include evaluating ideas, organizing facts, problem solving, solving math problems and analyzing data. Amazingly, these components appear in creative dance! Dance is filled with numbers, counting steps and sequencing movements, and other mathematical concepts that are used in many different ways in the warm ups, movement exploration activities, the gathering activity and relaxation. Logic develops as students make choices of movement and sequencing patterns deciding what seems to fit together best.

Linguistic Intelligence: This intelligence includes activities such as reading about topics, group projects, writing speeches/stories, keeping journals, and the spoken word. Creative dance makes use of and helps develop the linguistic intelligence by incorporating chanting, singing, reciting nursery rhymes and/or poetry, telling stories, and/or creating special symbols

for movement in the warm ups, movement exploration activities, the gathering activity, and sometimes during relaxation.

Intrapersonal Intelligence: Warm ups, movement exploration activities, the gathering activity, and relaxation all incorporate activities that encourage the growth and development of the intrapersonal intelligence—learning to understand oneself and how an individual relates to self and others. Some activities include opportunities to express one's own feelings through movement, finding one's own sense of space within the context of individual and group movement experiences, and planning and performing one's own movement patterns. Dance is a natural avenue leading toward developing intrapersonal intelligence and is a very personal discipline that helps an individual grow and achieve in unique ways through dancing in body, brain, and mind.

Interpersonal Intelligence: Dance provides a body of knowledge and activity that can stimulate the development of the interpersonal intelligence—connecting with others. Creative dance embodies teamwork, the sharing of ideas, and group projects all used in problem solving as dances are created and performed. The movement exploration activities and the gathering activity use partners and groups dancing together as various topics are explored. Cooperation and collaboration are two key elements in partner and group work. Learning how others move, what their ideas are on a topic, how they feel about the piece and the process, and ways in which each person solves a problem are important aspects of creative dance and of developing the interpersonal intelligence.

Naturalist Intelligence: Observational skills and being aware of the environment are two facets of this intelligence that connect with creative dance. This intelligence can be part of the warm ups and relaxation (using movement to express nature images such a falling raindrops, wind blowing, or melting snow), and a focal point for both movement exploration and gathering

activities. Students observe each other performing in varied environments and develop an understanding of the movements expressed and a relationship to nature. Certainly picturing and remembering movement patterns is essential for and nurtured by creative dance/movement activities. Studying nature and the environment provides cognitive, emotional, and physical stimulation for creating dances. Many teachers have designed creative dance lessons based on nature themes such as: rainbows (phenomenon, colors, and shape); animals and insects; trees and their parts; events in nature such as volcanoes, tornadoes, and earthquakes; and how sound travels (parts of the body that produce and hear sound).

Spiritual (Existential) Intelligence: Spiritual (or existential) intelligence finds a place to develop in creative dance through exploring movements that best express a dancer's soul, depth of feeling, and his or her ideas concerning a higher power, and /or higher levels of achievement on earth or beyond this life. Something exists in the spirit of dance and creative movement activities which allows growth regardless of the learner's primary intelligence. Dance transcends the usual boundaries of human limitations because of powerful thought, emotions, and movements used to express the deepest and most intimate feelings about our existence. Topics such as birth, death, our purpose on earth, or other "spiritual" themes can be explored through dance that can enhance and expand this intelligence. All lesson parts have the potential to develop this intelligence especially the gathering activity because it is the culminating experience that allows the dancer to reach deeper self-expression.

Examples of Local Practitioners Adapting Lessons

Teachers in the US and Malaysia have taken Lloyd's lesson plan format and recreated their own lessons. In fact, teachers in workshops and courses that extend beyond one day are required to create one or more lessons and return to share their work with others, giving feedback on their teaching experiences and student response. This requirement has motivated teachers to

discover that they can create a lesson by themselves using ideas from the workshop and/or Lloyd's book. Teachers know which content areas they are presenting in their classes and are encouraged to create lessons that dovetail with these topics; this gives an immediate and important connection that teachers may need to find the courage to design and teach a creative dance lesson.

An important adaptation of Lloyd's (1998) book was its translation into Bahasa Malaysia by Salmah Ayob (Lloyd and Salmah Ayob: 1993). Salmah Ayob had training and experience in creative dance and clearly understood the concepts and activities in Lloyd's book. She also understood the difficulties inherent in translating an English text into the Malay language—some words/concepts simply do not translate—but Salmah Ayob successfully found her own way through this process. She substituted selected Malay rhymes and poetry that would be more meaningful to her students.

One Malaysian couple who operates a preschool/kindergarten attended a workshop Lloyd conducted (years after piloting her book) and showed her a copy of their book that was filled with notations in Mandarin. They had done exactly what Lloyd had hoped teachers would do. This couple explained that they had taught straight from the book first, then adapted the material by extending and expanding lessons, and finally created their own lessons. This couple confirmed Lloyd's hope and belief that the book had been written in such a way that people could use the material without attending any training sessions.

Many other teachers have created their own lesson plans and taught them with successful results. Here are some lesson titles that were created (complete lessons appear in Lloyd's [1998] book). "West Indies Map Study" designed for a 6th grade social studies class that included identifying the country on the map, traveling kinds of movements that could be used

to get there (flying, island hopping, and swimming). Other activities to support the lesson topic are included (p. 305). This lesson focuses on the development of the logical-mathematical intelligence; other intelligences included are bodily-kinesthetic, and spatial.

A 5th grade teacher used the book, *The Teacher from the Black Lagoon* as a stimulus for a creative dance lesson. The students created movements to express the action in the story. The teacher's evaluation stated that:

> I was totally amazed at how freely they acted out this story. They loved it. They came up with some very clever actions. There were some who just copied other students' actions, but most tried to be original. When we finished the story they were eager to do another one (Lloyd 1998: 303).

This lesson has the potential of developing the linguistic intelligence, along with bodily-kinesthetic and spatial intelligences.

Other lesson titles include: "Machines and Pretending" (1st grade) and included movement activities that interpreted purposes and actions of appliances such as a toaster, popcorn popper, blender, washing machine, and a vacuum cleaner (Lloyd 1998: 278). This lesson has the potential of developing the logical-mathematical intelligence. "My Heart and What It Does When I Move" (ages 3-9 years) was an aerobic activity using an obstacle course and incorporating different movements over, under, on, and around chairs and balance beams, and include using a stethoscope for listening to the heart (Lloyd, 1998: 274-275). Bodily-kinesthetic intelligence can be developed through this lesson.

These are only a few samples of what teachers have created from the basic lesson plan format designed by Lloyd (1998). Each lesson created has the potential of developing one or more of the intelligences, and each lesson applies the principles of Brain-Based Learning that were discussed in this article.

Concluding Comments

Part of the purpose of promoting creative dance/movement activities, especially in the schools, is the tendency for many educational settings to focus on static learning environments and not give attention to exercise and movement in the classroom (Jensen 2000: chapter 12). In fact, the age of technology may be moving us closer and closer to physical inactivity. While many children in the past may have chosen play or activity instead of homework and received some physical development and increased range of motion, now for many, their play is also physical inactivity such as sitting at the computer or playing "game boy."

In our "modern world," a definite need for physical activity is clearly surfacing. Parents and teachers need to provide activities that not only stimulate the brain but also challenge their children and students physically. Creative dance can enhance the brain and it's learning capacities and capabilities, and develop MI that will provide a quality of life that no other discipline can offer.

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