

# **The Final Dimension of Multiple Intelligence: The Spiritual Taxonomy, a Challenge of Acceptance Shaped by Brain Based Learning.**

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## **Introduction**

Most educational reforms have been a response to the rigid, compartmentalized, reductionist view of learning that characterizes behaviorism. Behaviorists deliberately avoided the brain. There was little scientific information regarding the brain and even less understanding of its function (Hart, 1981). We have learned more about the brain in the past five years than in the previous one hundred. Almost ninety percent of all neuroscientists who ever lived are alive today (Roberts, 2002). In the 1960's behavioral psychology gave way to cognitive psychology and the 'cognitive revolution' was born (Anderson, 2002). The psychology of facts and rules (behaviorism) has been replaced by the psychology of models and processes (cognitive psychology). The two theories of learning have also been described as situated learning versus constructed learning (Anderson, 2002). B.F. Skinner, a noted behaviorist, indicates in his novel *Walden II* that learning may indeed be more than a set of conditioned responses and that a brain-based theory may more accurately reflect the needs of students. His character, Frazier, describes education: "Since our children remain happy, energetic, and curious, we don't need to teach "subjects" at all. We teach only the techniques of learning and thinking...we give our children opportunity and guidance, and they learn for themselves...Education...is part of the community...Its part of the Walden II code to encourage children in all the arts and crafts." (Anderson, 2002). The movement from behaviorism to cognitivism forced a reevaluation of how humans learn. This was supported by the assumption that learning and thinking indicate a complexity of human cognition that could not be explained by the stimulus response model.

## **Learning**

The brain receives input as it sends messages to the appropriate brain components. A single brain cell can be connected to 10,000 or more brain cells (Parnell, 1996). The brain uses two separate but simultaneous tendencies in processing information. One is to reduce the information to its parts while at the same time looking at how this fits into the whole pattern (Caine, 1994). The brain is also geared to a multi tasking approach to learning. Learning does not occur as series of linear steps. Learning occurs through a dynamic and complex series of experiences (Roberts, 2002). The brain is designed to perceive and organize patterns. Patterning is part of the brain's physiology. Neural cells form patterns. When previously acknowledge patterns are challenged or changed, learning occurs. Herb's neural learning theory, Lawson's code theory, and Hart's Proster theory are all based on the perception of patterns (Caine, 1994)

Learning is tied to emotions.

Fear, nervousness, anxiety, stress, self-esteem all impact on the ability to learn. Memories are tied to emotions. Memories are the building blocks of learning. Stimuli that are tied to a positive emotion serve to strengthen learning. Emotions operate continuously and unconsciously. They are an integral part of human existence. Along with this is the idea that the brain is a social

brain. The brain regions interact, and we learn through our interactions with each other and the community (Caine, 1994). If too little emotion is connected to the experience, the brain has a difficult time ‘tagging’ the material for long-term memory. If too much emotion is attached, the experience may be perceived as threatening (Roberts, 2002).

Learning involves focused attention and peripheral perception.

Every experience becomes encoded in the brain, even those we are not aware of. This memory record exists in every brain. Penfield and Roberts examined the speech mechanism of the brain by electrically stimulating areas of surgically exposed brain areas. The patients reported ‘flash-backs’ of events as clear as if they were re-living it. They were aware of simultaneously being in the operating room but also being in the experience. The triggered memories were unimportant, seemingly insignificant events such as standing on a street corner, hearing a mother call a child, or taking part in a conversation (Lawson, 1967). Our total environment not just the part we focus upon influences us.

Learning always involves conscious and unconscious processes.

Brain activity is an unconscious process. Neural connections are made without any conscious direction. Physiological responses may be outside the bounds of conscious control such as test anxiety. We learn what we are told and what we are not told. Perceptions enter the brain at the subconscious level and become implanted in memory. We may recognize a picture but not remember when it was taken, but have a recollection of the event portrayed.

Learning involves two different types of memory: spatial memory system and a set of systems for rote learning.

The spatial memory can be called the natural memory. The information stored there did not require any memorization. Information is stored instantaneously. This memory records experiences that occur in three dimensions. It is like emotions – it operates at the subconscious level, is continually operating, and it is infinite. Information that is dealt with in isolation from the meaningful, three-dimensional environment is difficult to encode and retrieve. It requires rehearsal (Caine, 1994).

Learning is enhanced by challenge and inhibited by threat.

The brain downshifts during times of threat (Proster theory). This makes motivation difficult if not impossible. Threat creates a sense of helplessness. The hippocampus reacts to stress and the brain functions sub optimally. Behavior becomes reptilian: automatic and rigid (Caine, 1994). This should not be confused with stress. Stress can be used to facilitate learning. Stress occurs when the learner is an experience that is new and different.

Learning must be authentic.

Authentic learning supports the principles of brain based learning. It taps into the innate desire to learn. It respects the individual need for safety and a non-threatening learning environment. The curriculum is current with real world problem solving. The context is useful and meaningful (Noe, 1998).

There is a misconception regarding the definition of authentic learning. It is not projects that must meet curriculum standards. Authentic learning is a holistic approach to learning. Academic achievement under authentic learning is defined by intellectual accomplishments;

construction of knowledge; disciplined inquiry; and the value of achievement beyond school (Noe, 1998). Authentic learning must be student driven, thus the authenticity of the learning. Brain based learning recognizes learning as a self-regulated process and authentic learning, by allowing students to drive the content, encourages higher level learning. Students are motivated to learn more and in more depth. Students seek out information. Learning becomes personally relevant (Noe, 1998). Brain based research supports that relevancy is required for learning to occur.

#### Learning is dependent on enrichment processes.

Brain based learning supports the role of enrichment and immersion in the learning process. Because learning happens at the perceptual and peripheral levels, all aspects of the learning environment should provide stimuli and learning experiences. The school buildings should be rich, stimulating environments. The walls should include 'teaching architecture' – displays created by the students. This gives them a sense of ownership and connection. The displays should change frequently to provide continual new stimuli. The spaces in the building should encourage brain-based learning. There should be places for group learning such as alcoves, breakout spaces, and 'living rooms' for conversation. There should be a combination of active and passive spaces. Students need places for quiet reflection as well as interaction. Indoor and outdoor spaces should be joined. This provides for movement that engages the motor cortex that is linked to the cerebral cortex.

Students should have a personalized space that serves as their home base. It should not be a metal locker. This space should allow for an expression of self-identity. The school should provide a sense of security. It should be a safe place. The community should be incorporated into the school. This creates authentic learning situations (Lackney, 2002).

The design of learning environments should be sensory friendly. Music can stimulate the part of the brain involved in spatial relationships, so music should be included (Chance, 2001). Brain based learning recognizes the interconnectedness of learning and emotions. The sense of smell triggers the olfactory bulbs at the base of the brain to fire neural impulses directly into the limbic system. Pleasant aromas could be used to induce positive emotions and effect student behavior and learning (Gabriel, 1999).

#### Learning should be integrated.

Brain based teaching methodologies include the integrated curriculum and cooperative learning. Students learn by forming patterns. Information in one discipline that is taught in isolation from another discipline forfeits the holistic approach. Students cannot see the whole of the pattern. Teaching should be organized around a theme or frame of reference. Art, music, science, language arts, and math should all be taught under the theme. Students do not learn in a linear approach, but in an immersed multi-tasking style (Caine, 1994).

#### Learning should be cooperative.

Cooperative learning builds on the innate desire of humans to be social and to communicate. The activities should encourage group problem solving and communication skills. Caution must be taken not to over structure the activity and take the responsibility for learning away from the students (Caine, 1994).

Learning is more than traditional teaching.

The following is a comparison of traditional versus brain-based teaching.

TRADITIONAL TEACHING    BRAIN BASED TEACHING		
Source of Information	Simple. Two way from teacher to book, worksheet or film to student	Complex. Social interactions Information book, worksheet or film to student group discovery, individual search and reflection, role playing, integrated subject matter.
Classroom organization	Linear. Individual work or teacher directed.	Complex. Thematic, integrative, cooperative, work stations, individualized projects.
Classroom Management	Hierarchical. Teacher controlled.	Complex. Designated status and responsibilities delegated to students and monitored by teacher.
Outcomes	Specified and convergent. Emphasis on memorized concepts, vocabulary, skills.	Complex. Emphasis on reorganization of information in unique ways, with both predictable and unpredictable outcomes, divergent and convergent, increase in natural knowledge demonstrated through ability to use learned skills in variable contexts.

from *Making Connections*, R. Caine, 1994

Learning is indeed multiple intelligences

Former President George Bush declared the 1990's the "Decade of the Brain". The brain decade has evolved into the brain millennium. Just as the factory has been replaced by the service industry so should the factory model of education is replaced a model based on brain-based education (Korcsmaros, 2003). Within that concept is the realization that such a replacement must address the whole child. Howard Gardner's Multiple Intelligence Theory has had a profound effect on how we view learning. Howard Gardner initially formulated a list of seven intelligences to include:

**Linguistic intelligence** involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals. This intelligence includes the ability to effectively use language to express oneself rhetorically or poetically; and 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.

**Musical intelligence** involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms.

**Bodily-kinesthetic intelligence** entails the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements.

**Spatial intelligence** involves the potential to recognize and use the patterns of wide space and more confined areas.

**Interpersonal intelligence** is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others.

**Intrapersonal intelligence** entails the capacity to understand oneself, to appreciate one's feelings, fears and motivations. (Gardner 1999: 41-43).

As can be seen Gardner's work parallels many of the learning implications of Brain Based Learning. For example, linguistics are both conscious and unconscious processes involving natural memory. Logical-mathematic intelligence the same. Musical intelligence is dependent on enrichment and integrated opportunities as well a peripheral perception. While these may be broad interpretations, the whole notion that the whole child is a complexity of intelligence dependent on neural patterning to expand the complexity of learning suggests that there is yet another dimension of that child, the Spiritual dimensions. Four other intelligences, naturalistic, existential, moral, and spiritual, have advanced as additions to the original seven originally identified intelligences but with little acceptance and advancement into practice. To that end, this article suggests the lack of acceptance may be in part due to the fact that a taxonomy of development has not been available to validate its significance to the learning of the whole child.

### Domains of development

Most textbooks on child development or human development list four domains of development. These domains are characterized by stages that are identifiable and in predictable sequences. That is not to say that the rate of development is the same for each child for there are many influences on development including developmental surges or delays in other domains. Some theorists also note discontinuous development meaning the stages are distinct and qualitatively different stages that define the way the child understands the world.

It is the contention of this author that spiritual development is not an activity isolated to the brain. I believe that spiritual development is more pervasive. It has the developmental sequence of a domain (Gibson, 2004). The development's complexity is linked to other domains (Cartwright, 2001) and is subject to the limitations of variable developmental rates based upon experience, wellness, motivation, and capacity.

## Experience and spiritual development

Experience is a factor in the development of the spiritual being. Experience is a factor in the development of other domains. The child who does not have the experience of physical exercise tends to have lower physical development. The child whose experience includes little language stimulation tends to lag behind his or her peers in cognitive development. Not unlike the other areas of development the spirit also is dependent upon experience for to reach fullest potential. Children whose parents encourage spiritual development tend to make greater advances in the area. Part of this experience may be motivation on the part learner.

## Taxonomy of spiritual development

Spiritual development is analogous to the formation of faith. It is a journey toward God, the deconstruction of one's perception of truth and the reconstruction of truth. Spirituality of the child occurs in stages.

**Innocence:** I believe spiritual development begins with innocence and then deconstructs truth. The infant until around the age of two, given typical cognitive development, has no concept of good and evil and therefore can attain neither. The newborn (infant from birth to age 3 months) is totally responsive to his or her biological needs and has little social or intentional thought. Baby does not cry through the night in disrespect to the parent's need for sleep, but because there is a biological imperative for feeding. Reflexes are the newborns most organized pattern of behavior. Before three weeks of age even turning of the head is a reflexive movement rather than intentional (Berk, 2005). One of the first experiences of intentional interaction is the social smile which typically is noted between six and ten weeks of age. This tends to be a monumental experience in the life of the parent. It is an event worthy of reporting to grandparents and neighbors alike.

**Knowledge of good and evil:** By the age of two, however, the parent is faced with a being that is capable of willful thought and behavior. It is at this point that the child has free will to intentionally choose. No, becomes the most popular word in the child's vocabulary. There is a reason that this period is often referred to as the terrible two's. It is as though the child has made the change from imitation to intention. The child has much knowledge of good and evil and explores the emergence of his or her new found freedom. The child can speak for self, move on his or her own and can demonstrate an emergent knowledge of good and evil which results in choice. This period may even emerge earlier depending upon the experiences of the child. The child exhibits a desire to please the authority figures in their life especially when it also pleases the child. During this period the avoidance of pain is clearly present and is a strong motivating force. It is also during this period that the young child, as I see it, develops a consciousness of the spiritual state.

Eli, a bright four-year-old in a daycare setting, was overheard talking to a pre-service teacher who was a visitor in his classroom he asked, "Did you go to church yesterday?" "No", she replied. A frown crossed his brow and he said "You'd better work that out." What if Eli had been raised Muslim instead of Christian would he have made the same exploration? It is doubtful he would have asked if his visitor had attended church, but he more than likely would have asked about religious services in alignment with his family's faith.

The emergence of the knowledge of good and evil, right and wrong emerges around the time of the pre-operational thought and is dependent upon the child's life experiences. They are so egocentric that they can see even this basic concept only from the child's own vantage point. A young child (age four) was being scolded by her older brother (age six). The older child reprimanded the younger child saying "We don't steal from them. They give us stuff and they are nice." Most would have hoped that the child would have told his sister not to steal at all, but the life experiences of this particular child put a fence around that concept saying it is wrong to steal from those who are nice to you. This was a product both of the child's life experience and his development characterized by his egocentric view point.

<b>Innocence</b>	<b>Knowledge of good and evil</b>	<b>State of accountability</b>	<b>Point of life decision</b>
Birth to 2	2-8 or 10 years old	10-11 years old or 4 <sup>th</sup> or 5 <sup>th</sup> grade	Late adolescence
-Child is without intentional thought or behavior	-From 2 until around 8-10 -May occur earlier depending on experiences of the child -Desire to please authority -Avoid pain -Develops a consciousness of a spiritual state	-Middle school and high school years was where we used to put this -Today 4th and 5th grade are critical windows for decision making -Recognizes responsibility for his or her behaviors	-Even for children who have made early commitments this is a time in which they reaffirm or reject that decision -Place self in submission -Life long battle with: *Obedience *Submission to will of God *Commission of duties *Obligations to God and man through God *Purging of one's self

**Age of accountability:** Today's young person is faced with early responsibility for making decisions. Fourth and fifth grade is now a critical window for making decisions (Barna, 2003). Just a few years ago this window was thought to be during middle school at the earliest and most likely to be at the high school level. Today, however, ten and eleven year olds are making critical decisions about risky behaviors such as underage drinking, the use of illegal drugs, and sexual activity. As a result of these decisions these *children* are forced to take the responsibility for his or her behaviors.

A mother of a fourth-grader was shocked when her daughter related a conversation about a fellow classmate who was struggling with the decision of whether or not to have oral sex with her boyfriend. The mother was further dismayed when the daughter related that this was not an isolated incident that most of her classmates were making similar decisions. By the late 1980's the sexual revolution had trickled down from late adolescence into the elementary age children. Children who do not have a good spiritual and moral underpinning have little on which to base their decision outside of their physical, social, and emotional desires.

**Age of commitment:** Late adolescence is another pivotal point for young people. Even for children who have made early commitments this is a time in which they reaffirm and further construct truth as their own. The result is an affirmation or rejection of the earlier decision. For children who are faithful this marks the beginning of the personal battle with obedience to the higher being which is a course of submitting oneself to the will of God. At this time the commission of spiritual duties, acts of service, initiation of one's self as a spiritual adult with all of the duties and responsibilities is crucial.

From working with college students at a small university I have had the opportunity to watch this stage of development emerge in many young people. Once the young person is out of the home, there is often a period of risky behavior. Mom and Dad are not around to ride herd so to speak and the feeling of freedom is often something to be explored even for students who have made a serious commitment to Christian principles. For most this is a one year exploration followed by renewed commitment that is based less on what the student believed as a child and more on what they now believe for themselves. At this time, often at the end of the freshman year of college the young person is faced with a decision to believe as they have been taught or to turn their backs on the "faith of their fathers".

It is my observation that those who do not take on the responsibilities of the Christian life at this point in their development become stagnant and complacent even when they remain faithful to the assembly, thus issue of faith without works is dead (James 2:26) at its worst and lukewarm hearts (Revelation 3:16) at its negative best. The continual purging of one's self, aligning one's self within the will of God is the only issue that will transform the individual into a spiritual giant. When this takes place in the life of the individual there is the potential for optimal spiritual development as defined as the reconstruction of truth. If God is truth, then the reconstruction of truth is the optima of spiritual development.

### Implications

Spiritual development is an area of development that is generally being neglected in United States culture, using indicators such as church attendance (Hadaway, K; Marler, P. and Chaves, M, 1993) , reading of sacred literature (Barna, 2003), and passing of family traditions and rituals (Eaker and Walters, 2002). This being the case, the neglect of children's spiritual neglect has long reaching ramifications. In the same way the neglect of any other area of development affects the development of the whole child. Therefore, this neglect results in adults not reaching their fullest potential in any area as development of one area affects the development of other areas. Secondly the neglect of a specific area results in the developmental deprivation. A child whose physical being is neglected does not reach the fullest potential in the physical realm. Neither does the child whose spiritual development is neglected. This child will not develop to his or her fullest. The implication is that neglected children grow up to be stifled adults whether it be physically or spiritually. The result can be a generation of spiritually stunted adults.

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