Culture and the Brain: Making the Most of Learning in the Early Childhood Classroom.

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Abstract: This article reviews the impetus for higher quality, culturally appropriate early learning experiences. It investigates the economic costs of low quality learning and the absence of early learning programs as well. The article identifies and explores the tenets of brain-based learning and its connection to culture. Finally, the article describes in detail, instructional practices that reflect cultural communication and natural, enjoyable learning experiences for young children.

Closing the Achievement Gap

We as stakeholders want to protect civil rights, provide better business opportunities, decrease unemployment, eradicate barriers to social justice; and end racism, then it is imperative that we face up to certain atrocious facts. A new study from Northeastern University found that black male unemployment was so bad that, in 2002, one out of every four African American men, 25 percent, were inactive all year long, a rate twice as high as that of white or Hispanic males. In 4th grade reading, the NAEP, referred to as the nation's report card, informs us that African American students score on average, 30 points lower than their Anglo peers. These children are most likely to be African American, Hispanic, special needs, English-language learners, and low socioeconomic status.

For more than 20 years we have grappled with the achievement gap. Since it is still with us, another one of the hard facts that we must face is that traditional answers and more of the same are not helping. Even with the most valiant efforts of educators, parents, and so many other people, millions of children just aren't learning. According to Paul Loeb (Soul of a Citizen, 1999, p 87-88) families in the top 25% in income send 86% of their children to college while families in the bottom 20% send 4% of their children to college. There are undoubtedly racial gaps, as well as language, early childhood experience, health, parent education, and school and class size gaps which under gird the achievement gap. Closing these gaps is essentially an issue of equity and justice not science. Before diverse students in poor quality schools can achieve as much as advantaged ones, they need to be part of a society that does not believe giving them

access to equal treatments and resources will hurt their own children or raise their taxes for funding of such schools.

There are copious reasons cited in the literature as to why an achievement gap exists between African-American, children of color and other children. The most prevailing are: the lack of political will by stakeholders to close the gap (Hilliard, 1991); a lack of belief in the capacity of children to learn (Delpit, 1995; Kohn, 1998); a belief that intelligence is innate and fixed and a conclusion that the educational disparity is a fact of nature (Singham, 1998; Hernstein & Murray, 1994); the gap is a product of economic discrepancy (Singham, 1998); and the continuation of a cultural gap between teachers and children of color which causes missed opportunities for learning (Delpit, 1995). All but one of the reasons for the achievement gap makes some sense and by the nature of the problem cited, in turn, suggests courses of action. Unfortunately, the courses of action often planned to address the achievement gap for African-American children take students out of the mainstream and onto tracked educational pathways.

Barriers specific to early learning

Children from low-income families often enter first grade with a 3,000-word vocabulary. Their peers from middle-income families know 5,000 words, and those from wealthy homes know up to 10,000 words. For teachers trying to understand why some urban students tend to trail more upscale classmates on standardized tests, this recent research holds some insight. In a nutshell, low-income students start out knowing less than their peers and never catch up. Students in the demographic groups listed above too often lack preschool experiences or experience low quality instruction in preschools. The education of these children is too often delayed and their opportunities for success

are weakened when judged against those of their peers who do attend high-quality pre-school programs.

In many states, most families bear the personal burden of finding and paying for pre-school education. Many state's most economically disadvantaged children are afforded preschool services through programs that are subsidized by the state and federal government. A great number of children in many states do not participate in preschool programs because (1) there is not enough funding to establish spaces for all eligible children who need services; (2) private program tuitions are more than many low-income working class families can afford; and (3) there is a lack of open preschool spaces in most communities. The cost of school failure is astounding. Retention in kindergarten and first grade because children lack basic language and socialization skills takes a vast toll on both families and school systems. Special education costs ensuing from developmental delays are far advanced in systems where children enter school without early education. Subsequent educational problems culminating in the failure to graduate from high school, teen pregnancy, dependency on welfare and criminal behavior are reduced through appropriate access to high-quality early learning programs. In what systematic way can we take the statistical and economic data presented and use it to inform instruction? There is another piece of this puzzle that we must consider when investigating early learning and it's perception of being effective; especially for children of working class families.

Brain-based research

Brain-based learning theory is based on the composition and utility of the brain. As long as the brain is not prohibited from completing its normal processes, learning will

occur. Scientists have found that a baby's experiences--whether she's happy, whether she hears lots of music or speech, gets hugs and eye contact--actually change the physiological development of her brain--the quality and quantity of the electrical wiring between cells. And the better they're wired, the better her life will likely be. Experts say that we are all capable of learning. Nonetheless, the actuality is that everyone does learn. Every individual is born with a brain that operates as an immensely powerful processor. Traditional schooling, however, often inhibits learning by dispiriting, overlooking, or punishing the brain's innate learning processes.

The fundamental principles of brain-based learning state that the brain is a parallel processor, meaning it can perform several activities at once, like hearing and touching. Learning engages the whole physiology and the search for meaning is innate. The quest for meaning comes by way of patterning and emotions are vital to patterning. The brain processes wholes and parts concurrently. Learning necessitates both focused attention and peripheral perception. Learning involves both conscious and unconscious processes. We have two types of memory: spatial and rote. We understand best when facts are entrenched in natural, spatial memory. Learning is improved by challenges and inhibited by threat and each brain is distinctive.

What Brain-Based Learning Suggests

How the brain works has a significant impact on what kinds of learning activities are most effective. Educators need to help students have fitting experiences and make the most of those experiences. As Renate Caine illustrates on p. 113 of her book *Making Connections*, three interactive basics are indispensable to this process:

- Teachers must immerse learners in complex, interactive experiences that are both rich and real. One excellent example is immersing students in a foreign culture to teach them a second language. Educators must take advantage of the brain's ability to parallel process.
- Students must have a personally meaningful challenge. Such challenges stimulate a student's mind to the desired state of alertness.
- In order for a student to gain insight about a problem, there must be intensive analysis of the different ways to approach it, and about learning in general. This is what's known as the "active processing of experience."

There are several other tenets of brain-based learning. Feedback is best when it comes from reality, rather than from an authority figure. People learn best when solving realistic problems. The big picture can't be separated from the details. Because every brain is different, educators should allow learners to customize their own environments. The best problem solvers are those that incorporate humor. Designers of educational tools must be inventive in their creation of brain-compatible setting. Instructors need to realize that the best way to learn is not through lecture, but by participation in realistic environments that let learners try new things safely. What are the implications for early learning?

How Brain-Based Learning Impacts Education

When it comes to curriculum teachers must design learning around student interests and make learning relative. When instruction is being considered, educators let students learn in teams and use tangential learning. Teachers organize learning around real-life problems, encouraging students to also learn in settings outside the classroom and the school building. When looking at assessment it should allow them to understand

their own learning styles and preferences. This way, students examine and improve their own learning process. We must create various opportunities for learning.

Opportunities for Learning

In acknowledging fundamental principles of brain-based learning; these and other findings persuade teachers and parents to make available to very young children to a variety of learning experiences-providing blocks and beads to handle and observe, talking to the child, playing peek-a-boo. The NCTM Curriculum and Evaluation Standards promote teachers of kindergartners to let students work with patterns; sort, count, and classify objects; use numbers in games; and explore geometric shapes and figures. It is never too soon to involve such young children in conversations about patterns, beginning data analysis, sequencing, and number sense. The initiation of a second language is best attempted in these early years as well. In fact, some researchers look to the first year of life as the best "window of opportunity" for accelerated learning. Pat Kuhl, Neuroscientist states, “We used to think language began at the one year stage when kids started producing their first words and they started to understand words. Now what we’re learning is well before the stage at which babies understand or produce any words at all, their hearing systems are beginning to be sculpted by language input”. So, is this conversation finished? Are all of the elements of this situation completely in place? Not quite. The final piece of this powerful conversation is the impetus of culture. It is important that we examine culture within the domains of early childhood; in this case, the play and learning.

The way the brain makes learning occur does not differ from one culture to another. The brain, unlike the mind, is a biological entity, not a social, cultural product (Eisner,

1994). Many researchers have spent the last century looking at the impact of culture on development. The beginning of this research is documented in the work of Erik Erikson. We learned from Erikson that our personality traits come in opposites. We think of ourselves as optimistic or pessimistic, independent or dependent, emotional or unemotional, adventurous or cautious, leader or follower, aggressive or passive. Many of these are inherent temperament qualities, but other distinct characteristics, such as feeling either competent or inferior, seemed to be learned, based on the challenges and support we receive in developing. Erikson did a great deal to explore this concept. Erikson believed that the ego exists from birth and that behavior is not totally defensive. Based in part on his study of Sioux Indians on a reservation, Erikson became intensely aware of the huge influence of culture on behavior and placed more emphasis on the external world, such as depression and social conflict. He felt the path of development is established by the interface of the body, mind, and cultural influences.

Culture, Play, and Learning

The greatest vehicle for learning in early childhood is play. How we construe child's play and development differs from culture to culture. Even defining child's play and a child's other activities differ depending on one's culture. For instance, many families with Asian ethnic cultural influences are inclined to see play and academic activity discretely. Many U.S. educators and researchers with Anglo-American perspectives strongly believe that child-led play and other experiences are already associated to the child's development of later scholastic experiences.

In this context, individual independence, self-sufficiency, and self-help are respected. This individually oriented cultural mind-set shapes the researchers',

educators', and parents' attitude, understanding, and explanation of child's play phenomena within that paradigm. It also guides them into seeing interaction with the child based on that culturally shaped mode. For instance, they are looking at whether the child can be in power of the play object, whether the particular child becomes conscious that there are other individual(s), whether he or she is able to relate with them, how much same-age peer contact occurs; or whether the particular child is able to collaborate with other individual(s) in a group play.

Families with a strong African-American, Asian-American, or Hispanic-American upbringing tend to be rather group-oriented in their understanding of social event compared to families from Anglo-American cultures. Within these cultural contexts family interdependence and family trust are highly encouraged and expected. Thus, researchers from these cultural contexts focus on: whether the child receives recurrent multi-age family interactions; within the family interaction, whether the child is psychologically happy and takes pleasure in the play; whether the child is expressively safe and depends on the family members in diverse forms of play. Based on this cultural frame of examining child's play, researchers report that during infancy and toddlerhood and even up to preschool children obtain regular child/parent, child/adult, multi-age child/child or child/children play opportunities within one's own family background. The very young child is often in the center of attending multi-age family-member play interactions, an assortment of forms of physical play with parents or multi-age family members. There is much eye contact, offering and receiving of toys, sharing, lending, turn-taking, and even organized cooperative play, which is all classified by the Anglo-American viewpoint as a high level of child's play and occurs in nursery school years or

older. Non-Anglo researchers, teachers, and parents are somewhat more people-focus, pyschosocial, and multi-interactional rather than, individual-, sociocognitive-focus.

Researchers and educators with a strong Anglo-American perspective tend to make sense of child's play and development based on how or what the child can do sociocognitively for oneself as an individual in the social context. With Asian-, African-, or Hispanic-American perspective the focus is on how the child can socioemotionally interact with family members and others as a group member. Therefore, these culturally different viewpoints create a somewhat different line of insight in child's play and their development. Even more, they appreciate child's play and the developmental phenomena in culturally different ways. We all have a culturally produced frame of mind set. This culturally grounded event tends to lead people to believe that their ways of looking at things are commonly acceptable, which may not be true. Consequently, we all can become culturally sightless.

This lack of understanding of this information and the learning process with the impact of culture on learning and achievement has a limiting affect on the pedagogy or instructional choices teachers make, minimizing effectiveness in eliciting and nurturing the potential of not just African American students, but all students whose achievement is less than their potential. Understanding learning and the interrelationship of culture and learning strengthens teachers' abilities to have a positive impact on student achievement (Jackson, 2003). When our perceptions expand to recognize the power that addressing students' culture and language has on the learning process, we design opportunities for their strengths to blossom, confidence to build, and achievement to soar (Jackson,2003).

How do we use brain based research and cultural relevance in early childhood classroom? When teachers understand intelligence and learning they can make better choices of effective learning strategies that do not depend on race or ethnicity but rather build on the cultural frame of references of their students (Feuerstein, 1982; Mahiri, 1998). By using developmentally and culturally appropriate practices to plan and implement programs for early childhood, education and services, we should implement curriculum and instruction to meet children's developmental needs and interests. We should provide a safe and healthy learning environment for children. Finally, foster positive collaborative relationships with children and their families. In connecting the previous information about brain-based learning, we must look at how the principles are aligned with early learning experiences.

Jensen's highlights on the brain and learning

Basically, in the context of early learning, the points from Jensen's text are situated early childhood classroom pedagogy. Here are some of the most salient points when it comes to early learning and culture.

- **Whole to Part**

"Wholes taught before parts are recalled better. Our mind recalls best with context, a global understanding, and complete pictures to remember."

(Jensen, p.110)

- **The Power of Patterns**

"The brain seeks patterns--it is designed to perceive and generate patterns. The patterns give context to information that otherwise would be dismissed as meaningless…"

(Jensen, p.95 and Caine and Caine, p.89)

- **Novelty and Attention**

"…provide a rich balance of novelty and ritual. Novelty ensures attentional bias, and ritual ensures that there are predictable structures for low stress." …"The old notion about attention was get it and keep it. Today, you can have students' attention 20-40-percent of the time and get terrific results. We know how to get attention: use contrast. In fact, nearly everything that is novel will garner attention; the contrast alone is enough." (Jensen, pgs. 50-51)

- **Socializing**

"The brain is a social brain. We have a brain-based drive to belong to a group and to relate to others. Hence educators need to support and consolidate social relationships and a sense of community."

(Caine and Caine, p.125)

- **The Arts**

" We know that the arts can provide enrichment. "Singing is good stimulation for the brain. Music researcher M. Kalmar found that music has many positive school correlates. .. the experimental group had better abstract conceptual thinking, stronger motor development, coordination, creativity, and verbal abilities."

(Jensen, p.38)

- **Movement and Learning**

"Today's brain, mind, and body research established significant links between movement and learning. Educators ought to be purposeful about integrating movement activities into everyday learning. "

(Jensen, p.88)

- **Emotions and Cognition**

"Emotions and cognition cannot be separated. Emotions are also crucial to memory because they facilitate the storage and recall of information."(Caine and Caine, p.82) Emotions drive attention, create meaning, and have their own memory pathways (Ledoux, 1994 in Jensen, p.72). You can't get more related to learning than that. "

Connecting Culture and the Brain, How They Connect

When children are engaged in what Augusta Mann calls "Touching the Spirit" they are activating the heart of holistic development which includes culture. Touching the Spirit includes ritual rhythm, repetition, recitation and relationship. This is a natural part of culture and learning for children of diverse background. Why not utilize this in combination with the power of patterns harnessed by the brain? Research informs us that highly effective early childhood classrooms incorporate ritual to ensure security and establish trust. Effective early childhood professionals also understand the power of rhythm and repetition starting from infancy in language and movement. In many cultures of color, this form of social learning is automatic and ever present. What does this mean for early learning instruction? When the brain is emotionally engaged, cemented learning takes place. The early learning classroom is the crux of socio-emotional development. So what else does this imply for early learning experiences?

Conceptual or Holistic learning-"Wholes taught before parts are recalled better. Our mind recalls best with context, a global understanding, and complete pictures to remember." (Jensen, p.110) When holistic and conceptual learning takes place young learners can engage in the total experiences of understanding. When call upon your past learning experiences, you can observe yourself engaged in a wide range of behaviors, including (1) aggressively applying what you were learning to realistic problems and real-world decisions; (2) construing your world using this situated knowledge; (3)

explaining your experiences in verbal and non-verbal manner so that others can connect with and understand them; (4) scrutinizing conflicting standpoint related to your experiences; (5) conveying empathy for those whose perceptions and judgments were different than your own, authenticating your growing ability to sympathize; and, (6) throughout the event, representing increasing knowledge of self and an escalating ability to review, assess, and revise your own thinking and behavior. We must be cautious in inspecting other instructional strands that are an integral part of the makings of early learning.

Music-"We know that the arts can provide enrichment. "Singing is good stimulation for the brain. Music researcher M. Kalmar found that music has many positive school correlates. .. the experimental group had better abstract conceptual thinking, stronger motor development, coordination, creativity, and verbal abilities." (Jensen, p.38) Older preschool children can conceive movement as a type of nonverbal communication as they start to tell stories and convey their emotions through physical movements. They learn to mimic patterns of reverberation and rhythm and become aware of music in environment, for example whistling wind, animals and insects.

When youngsters start to use their voices to sing, it becomes critical for them to listen carefully. At this phase, they enjoy songs that ask them to dance and swing around, jump, shift, and clap their hands. Participating in call and response type of game allows them to copy and internalize the different ways their bodies can keep rhythm with a song, and use of simple toys or objects will help children incorporate music with movement. Children react happily to music that is recognizable. Playing a recording several times as background music can increase awareness and develop vocabulary as the lines are

learned. Formulating new verses for familiar songs and spur-of-the-moment singing as they play can help children comprehend that music is a type of creative illustration.

Movement-"Today's brain, mind, and body research established significant links between movement and learning. Educators ought to be purposeful about integrating movement activities into everyday learning. "(Jensen, p.88) When teachers carry on outdoor play actions with the class, they can give response to all children and institute a common foundation of learning encounter. Teachers lead children through a progression of movement activities in which they stay repetitively active and keep their heart rates raised. The large group setup also allows educators to give emphasis to the development of skills such as pitching or catching to assist all children discovering movement cues (like aiming toward the object or looking at the ball). Children gain knowledge of and rehearse skills they will later use indoors in activity stations. These cues help children encounter success in the outdoor learning stations explained next. Teachers can also utilize this time to vocally emphasize significant movement concepts, such as positional words in/out and beside/behind/in front of, that learners use in the classroom.

Spoken words/poetry-"Provides a rich balance of novelty and ritual. Novelty ensures attentional bias, and ritual ensures that there are predictable structures for low stress." …"The old notion about attention was get it and keep it. Today, you can have students' attention 20-40- percent of the time and get terrific results. We know how to get attention: use contrast. In fact, nearly everything that is novel will garner attention; the contrast alone is enough." (Jensen, pgs. 50-51). This would implicate using literacy rich practices such as read alouds, play acting and reader's theater. Reading aloud allows parents and teachers model examples for reading. When youngsters see adults excited

about reading, they will get caught up in their eagerness. Reading aloud can present books and types of literature—poetry, short stories, biographies— children may possibly not discover under their own guise. Reading aloud introduces book language, which diverges from language heard in daily dialogue, on television, and in movies. Book language is more evocative and uses more conventional grammatical configuration.

Recitations and repetition (nursery rhymes; multicultural)- "The brain seeks patterns--it is designed to perceive and generate patterns. The patterns give context to information that otherwise would be dismissed as meaningless…"(Jensen, p.95 and Caine and Caine, p.89) Children learn to endear the sound of language before they ever notice the existence of written words on a page. They giggle or babble when you talk or sing to them, and as they develop, quickly pick up the ideas and words they hear used. Reading aloud with youngsters is a critical component for language development and is one of the most significant activities for priming them to be successful as readers. Toddlers take pleasure in hearing language. Communicate verbally as you do easy everyday things together: recite nursery rhymes, and demonstrate finger plays, games and movement songs.

Summary

This article seeks to share major tenets of brain-based research and its relationship with culture. A number of scientists who study the brain believe that at birth the human brain has the maximum number of neurons it will ever have. Some connections, those that control such involuntary tasks as respiratory and cardio functions, are existing at birth, but most of the individual's mental wiring stems from experiences that welcome the newborn and continue, almost certainly, all through his or her life. How and when mental

relationships are made is a topic of discussion. Some scientists believe the paths or circuits are completed by age five or six. Other research studies prolong the phase of development from birth to the later school age years.

Nevertheless, others debate that nerve connections can be altered throughout life with new connections taking shape perhaps even in adulthood. For teachers and researchers who align themselves to the first interpretation, early learning programs and activities targeted toward preschoolers (e.g., Little Einstein or Dora the Explorer) increase in significance. The second view under girds providing complex content area topics much earlier in the curriculum than has been traditional offered. The third view promotes attempts and opportunities for lifelong learning.

According to Wade Nobles, “culture is to humans as water is to the fish. It is our total environment. As such, educations as well as curriculum development are cultural phenomena.” He also states in his research that culture is essentially the indiscernible element of all curricula. For this reason, the whole of our professional development and education are adjoined by what is called “customs or professional conventions”, which are essentially no more than cultural qualities or custom. Nobles shares that when learners are culturally deprived, they are like” fish out of water”.

It is time for us to rethink this relationship with a learning outcome-based framework in mind. We must enhance pedagogy by planning for a culturally relevant learning environment in early childhood classrooms across the nation. If we want to close the achievement gap, we must start learning with culture and the brain.

In conclusion, it is critical that we utilize the knowledge learned about the brain and move it into practical applications. It is also imperative that we acknowledge the

power of culture as a viable mediator for learning and retaining information about ourselves and our world.

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