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REDEFINING EDUCATIONAL PRACTICES INTEGRATING INDIAN EPISTEMOLOGY AND MODERN COGNITIVE NEUROSCIENCES

COMPENDIUM OF PAPERS

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Brain Based Learning as a determinant of Academic Performance in Struggling Learners

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Abstract

The enormous interest in the brain-based multiple intelligences help to bring about the new field of Brain-Based Learning (BBL). Brain-Based Learning can be viewed as techniques gleaned from research in neurology and cognitive science used to enhance teacher instruction. Jensen (1995/2000) defines BBL as "learning in accordance with the way the brain is naturally designed to learn" (p.6). In the context of Education, due to the great array of development, a large amount of insight has been gained that have implications for teaching and learning. All these developments lead to the newer approach of teaching and learning, which is *Brain-based learning* that can have the capability of bringing phenomenal transition in the whole education system.

Introduction

A basic component of brain-based learning is that our emotions influence our ability to learn. Our brains are constantly striving to make connections between intellect and emotions. In other words, teachers are most likely to gain and keep the attention of students when they engage students' brain-based emotional systems in a challenging yet non-intrusive manner. Neuroscience research that explains how the brain learns is a dynamic field. Students come in all shapes and sizes. Even with the growth of scientific information, the human brain is, for the most part, still unknown, as the brain is extremely complex. The brain is the major controller of the body, similar to a computer's CPU (central processing unit). It is the information processor of the human body. The brain is capable of multitasking, and it "assembles, patterns, composes meaning, and sorts daily life experiences from an extraordinary number of clues" (Jensen,2000, p. 12). The brain, in addition to being extremely complex, is a dynamic and adaptive system. The brain contains hundreds of billions of neurons and interneurons that produce an enormous number of neural nets, or groups of neurons working together, from which our daily experience is created (Lackney,n.d.).

Brain-Based Learning

All learning is undoubtedly brain based, but all the teaching is not brain based, and this is the only point which precisely differentiates brain-based learning from the conventional teaching and learning process. The brain-based learning is based on the firm pillars of the Brain/Mind learning principles, which acquaint the teachers to provide the instructions to the students in such a manner that the students can process, store and retain all the information given to them in the best possible manner and thus not only learning, but also teaching becomes brain based. Brain-Based learning is a comprehensive approach to instruction based on how current research in neuroscience suggests our brain learns naturally.

Fundamental elements of brain-based learning

Three important elements associated with brain-based learning are given below:

- Orchestrated immersion: Creating learning environments that fully immerse students in an educational experience.
- Relaxed alertness: Trying to eliminate fear in learners, while maintaining a highly challenging environment
- Active processing: Allowing the learner to consolidate and internalize information by actively processing it.

BBL Principles in Learning

Caine and Caine (1995, 2001) established the brain-based theory of learning with basic principles that apply to classroom instruction. They

proposed the following 12 principles for brain-based learning:

One: The brain is a parallel processor.

Thoughts, intuitions, pre-dispositions, and emotions operate simultaneously and interact with other modes of information. Good teaching takes this into consideration.

Two: Learning engages the entire physiology.

This means that the physical health of the child — the amount of sleep, the nutrition — affects the brain. We are physiologically programmed, and we have cycles that have to be developed. An adolescent who does not get enough sleep one night will not absorb much new information the next day.

Three: The search for meaning is innate.

Both familiarity and novelty must be combined in a learning environment. The brain needs and automatically registers the familiar while simultaneously searching for and responding to additional stimuli. In teaching we should give the children a chance to reflect, and to see how things are related one another.

Four: The search for meaning occurs through "patterning."

Patterning refers to the organization and categorization of information. The brain's goal is to invest information with personal meaning through making and detecting patterns based on what we already know or have experienced (link to prior knowledge).The ideal process in learning is to present information in a way that allows the brain to extract patterns rather than attempt to impose them. The brain is capable of taking in enormous amounts of information when that information is related in a way so the brain can pattern appropriately.

Five: Emotions are critical to patterning.

Emotions from each experience determines whether we want more or less of that experience. Emotions motivate us to learn, and to create. Neuroscientists believe that emotions are fundamental to learning. Motivation in the brain is driven by emotions. Different aspects of memory are activated in different emotional contexts.

Six: Every brain simultaneously perceives and creates parts and wholes.

Both hemispheres interact in almost every activity. The brain reduces information into parts and perceives holistically at the same time. The learners use both the left and right hemispheres and the brain processes parts and wholes simultaneously.

Seven: Learning involves both focused attention and peripheral perception.

The brain responds to the entire sensory context in which teaching and communication occur. Children learn from everything. Everything goes into the brain. Children are immersed in learning in the school, in the home, in the community. They interact with each other in this rich learning environment.

Eight: Learning always involves conscious and unconscious processes.

Much of our learning is the result of unconscious processing, which means that understanding may not occur during class, but may occur hours, weeks or months later."Active processing" allows students to review how and what they've absorbed so they begin to take charge of their learning and of the development of personal meaning.

Nine: We have at least two types of memory — a spatial memory system and a set of systems for rote learning.

Spatial Memory registers everything. It is always engaged, inexhaustible, and motivated by novelty Rote Memory recalls unrelated information and motivated by reward and punishment. With this system, students are motivated by reward and punishment; many trials are usually needed; and the brain is easily fatigued since there is stress on a limited number of brain cells. Learning means that information is related and connected to the learner.

Ten: The brain understands and remembers best when facts and skills are embedded in natural spatial memory.

Building the necessary neural connections by exposure, repetition, and practice is important to the student; the richer and more complex the experiences we have, the more elastic our brain becomes (a denser brain leads to greater capacity for new and deeper understanding).

Eleven: Learning is enhanced by challenge and inhibited by threat.

The brain learns optimally with maximum connections when appropriately challenged, but becomes less flexible and reverts to primitive

attitudes and procedures under perceived threat. Many children come to school downshifted because they come from an environment of threat. Relaxation techniques are the only thing we know that will reverse the stress hormones in the body.

Twelve: Each brain is unique.

Each person's brain matures differently, and brain size and weight can vary by as much as 50%. The brain works better when facts and skills are embedded in real experiences. We have many things in common, but we also are very, very different. We need to understand how we learn and how we perceive the world and to know that men and women see the world differently.

Struggling Learners

A struggling learner is a student who has difficulty in keeping up with classmates of the same age in a learning environment. Struggling learner's often have difficulty in organizing themselves and their work environment, do not take oral instructions the first time given, are overwhelmed by work tasks and need work chunked for them and have weak social and emotional skills. These children can easily fall between the cracks of the educational system unless we provide them with the assistance they need.

BBL to improve the Academic Performance of Struggling Learners

Brain-based learning is really dealing the weak emotional skill of struggling learners, their stress level, which arises due to various academic reasons, the fear or threat of the tests or examination, which collectively hampers the academic performance of the struggling learners in the most deteriorating manner. Struggling learners need the instructions in the way when their needs and every problem can be considered and Brain-based learning can be the solution to every arise question and can positively affect their academic performance and if once their needs and problems are solved then with this whole classroom and in turn the whole educational system will surely be positively benefitted.

Brain -based learning provides teachers with a format for using research in the neurosciences as well as research-based effective instructional practices to guide them in planning, implementing, and assessing a sound program for all the learners. Teachers who utilize Brain-based strategies in the classroom to enhance their students' performance are seemingly better able to positively impact learners on social, emotional and cognitive levels.

What the research on Brain-based educational techniques seems to indicate is that teachers should continue to learn how to implement classroom techniques that support student's growth both socially and academically. In the light of Brain-based learning, if the struggling learners and their problems will be considered who falls in the crevices of whole education system, then they surely will be benefitted. This Brain-based learning will not only turn fruitful for the normal learners, but also for the struggling learners and will give the whole education system a transition.

Conclusion

Brain-based research is validating the assertion that learning is individual and unique. This implies that current practices such as standardized materials and instruction may, in fact, diminish or inhibit learning. Brain-based learning provides new directions for educators who want to achieve more focused and informed teaching. With additional research in brain-based approaches, there may better options for those struggling with learning. Brain-based research needs to be interpreted for educators so that they can utilize this information in the classroom.

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