

**BRAIN-BASED LEARNING AND ITS IMPLICATION IN TEACHING****Shubhangi L Godse**

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Abstract

The brain based learning is a new concept in teaching and learning process. Teaching while considering the capacity and functions of brain enhances the learning and achievement of students. There are so many researches done on brain structure and functions of its parts. This leads to the use of brainbased programs in teaching and its application from primary level to graduate level. In today's teaching many teachers have been employing brain based learning strategies in their classrooms. Teachers are using information from the neuroscience of the brain and how brain learns to guide their teaching strategies. The brain based education has been proved more effective for all students and many researches done in foreign countries and proved the effectiveness of the knowledge that how the brain works? This paper discussed the working of brain and the brain based principles to be considered while teaching. The main teaching strategies are orchestrated immersion, relaxed alertness, active processing it means learning environment should be interesting, fear free, connecting information to prior learning, activities in pair or group, praising, playing favoritemusic etc. All these strategies should be used in teaching. The teacher educators must know the theory behind brain based learning so that they can use this in guiding the student teachers and preparing their lesson plans.

Keywords: Brain based learning, orchestrated immersion, relaxed alertness, active processing.



Introduction

Teacher education course is now changing tremendously, in present situation teaching and learning is student centered. Teacher must know the learning of students and how the achievement is enhanced. For this brain based learning plays most important part. Subject mastery is also increased when the brain based strategies are used in teaching. Brain-based learning has hatched a new discipline now entitled by some as educational neuroscience or by others mind, brain, and education science. Whatever we call this “not really new” discipline, it is a comprehensive approach to instructions using current research from neuroscience. Brain-based education emphasizes how the brain learns naturally and is based on what we currently know about the actual structure and function of the human brain at various developmental stages. Using the latest neural research, educational techniques that are brain friendly provide a biologically driven framework for creating effective instructions. This theory also helps to explain recurring learning behaviors, and is a meta-concept that includes an electric mixture of techniques. Currently, related techniques stress allowing teachers to connect learning to student’s real lives and emotional experiences, as well as their personal histories and experiences. This form of learning also encompasses such newer educational concepts like: mastery learning, experiential learning, learning styles, multiple intelligences, cooperative learning, practical simulations, experiential learning, problem-based learning, movement education, also known as embodied learning.

History of how brain works?

For 2,000 years there have been primitive models of how the brain works. Up until the mid-1900s the brain was compared to a city’s switchboard. Brain theory in the 1970s spoke of the right and left-brain. Later, Paul McClean developed a concept of the *Triune Brain* which refers to the evolution of the human brain in three parts. In this theory McClean hypothesized that survival learning is in the lower brain, emotions were in the mid-brain, and higher order thinking took place in the upper brain. Currently, brain-based education embraces a more holistic view of the brain, is one that is more systems-based and gestalt -- the whole being greater than the sum of its parts.

During the last two decades neuroscientists have been doing research that has implications for improved teaching practices as they have obtained much information on how the brain works from autopsies, experiments, and different types of scans -- MRIs, EEGs, PET and CAT scans. Information has been gleaned as neuroscientists construct clinical studies that use double blind, large, diverse, multi-age, multicultural groups of people to gather reliable information. This information has helped determine how human learning actually occurs. In essence, these scientists have been peering into the little black box in order to determine how the brain processes and retains information. Thus, technology in medicine has paved the way for many new learning innovations. The brain's activity is controlled by genetics, development, experience, culture, environment, and emotions, and it is constantly under stimulation to change (Gardner, 1999). Since the 1980s, significant scientific findings have emerged about how learning occurs. By the 1990s, the scientific community had started to increase dramatically with new information about the brain. Developments in technology have allowed researchers to see inside the brain, and visualize how the structures in the brain communicate. Common imaging techniques used by researchers include computerized axial tomography (CAT, or computerized X-rays), functional magnetic resonance imaging (fMRI), and positron emission Tomography (PET). These tools have allowed scientists to learn more about the brain, and findings made through them are influencing the worlds of education, science, and medicine.

With advances in technology and knowledge about the brain, there has been the development of brain-compatible or brain-based learning. Brain-based learning is a new paradigm that has tremendous implications for educators and students.

Neuroscience research needs to be translated into brain-based learning strategies that can be used by educators, and instructional design theories need to be developed in response to the new brain-based information being discovered by scientists. These theories should attempt to translate the neuroscience research, and provide methods that help educators to develop instructional strategies.

Principles directing brain-based education:

Some principles are suggested for teachers as the teaching strategies to be considered while teaching. These principles are suggested by Renate and Geoffrey Caine who studied the brain structure and functions. These principles are as follows-

The brain is a parallel processor. It can perform several activities at once.

The brain perceives wholes and parts simultaneously.

Information is stored in multiple areas of the brain, and can be retrieved through multiple memory and neural pathways.

Learning engages the whole body.

All learning is mind-body: movement, foods, attention cycles, and chemicals modulate learning.

Humans search for meaning is innate.

The search for meaning comes through patterning.

Emotions are critical to patterning, and drive our attention, meaning and memory.

Meaning is more important than just information.

Learning involves focused attention and peripheral perception.

We have two types of memory: spatial and rote.

We understand best when facts are embedded in natural spatial memory.

The brain is social. It develops better in concert with other brains.

Complex learning is enhanced by challenge and inhibited by stress.

Every brain is uniquely organized.

Learning is developmental.

Implications and suggestions for best teaching practices and optimal learning:

There are many different examples of interactive teaching elements that emerge from these principles like: Orchestrated immersion: Learning environments are created that immerse students in a learning experience. Primary teachers build a rainforest in the classroom complete with stuffed animals and cardboard and paper trees. Intermediate teachers take students to a school forest to explore and identify animal tracks in the snow and complete orienteering experiences with a compass. In schools overnight camp can be arranged for star gazing and many group activities. Relaxed alertness: An effort is made to eliminate fear, while maintaining a highly challenging environment; teachers may play classical music when appropriate to set a relaxed tone in the classroom. Bright lights are dimmed. Vanilla candles are used to calm students and peppermint scents are used to stimulate the senses. All students are accepted with their various learning styles, capabilities, or disabilities. A relaxed accepting environment pervades the room. Children are stretched to maximize their cognitive potentials in teaching

environments that are supportive, comfortable, and non-threatening. Teacher can give candies,toffies and praise them for fear free environment.

Active processing: The learner consolidates and internalizes information by actively processing it. Information is intentionally connected to prior learning. The stage is set before a unit of study is begun by the teacher preparing the students to attach new information to prior knowledge so the new information has something to latch onto. This also requires time to reflect on materials that have been presented. Teacher should arrange the exhibition for displaying the material done by students.

How to provide friendly learning environment?

- Rich, stimulating environments using student created materials and products are evident on bulletin boards and display areas.
- Places for group learning like tables and desks grouped together, to stimulate social skills and cooperative work groups.
- Have comfortable furniture and couches available for casual discussion areas. Carpeted and areas with large pillows who prefer not the work at a desk or table.
- Link indoor and outdoor spaces so students can move about using their motor cortex for more brain oxygenation.
- Safe places for students to be where threat is reduced, particularly in large urban settings.
- Variety of places that provide different lighting, and nooks and crannies. Many elementary children prefer the floor and under tables to work with a partner.
- Change displays in the classroom regularly to provide a stimulating situations for brain development.
- Have students create stage sets where they can act out scenes from their readings or demonstrate a science principle or act out a dialogue between historical figures.
- Have multiple resources available. Provide educational, physical and a variety of setting within the classroom so that learning activities can be integrated easily.
- Computers areas, wet areas, experimental science areas should be in close proximity to one another. Multiple functions of learning is our goal.
- Flexibility: This common principle of the past is relevant. The teachable moment must be recognized and capitalized upon. Dimensions of flexibility are evident in other principles.

- Active and passive places: Students need quiet areas for reflection and retreat from others to use intrapersonal intelligences.
- Personal space: Students need a home base, a desk, a locker area. All this allows learners to express their unique identity.
- The community at large as an optimal learning environment: Teachers need to find ways to fully use city space and natural space to use as a primary learning setting. Technology, distance learning, community and business partnerships, all need to be explored by educational institutions.
- Enrichment: The brain can grow new connections at any age. Challenging, complex experiences with appropriate feedback are best. Cognitive skills develop better with music and motor skills. (D’Arcangelo)

Utilizing both music and art: Music: Music can lower stress, boost learning when used 3 different ways:

1. As a carrier - using melody or beat to encode content,
2. As arousal - to calm down or energize,
3. As a primer - to prepare specific pathways for learning content) impacts the immune system, and is an energy source for the brain.

Art is an important part of brain-based education, it provides many learners with avenues of expression and emotional connection and release. It is important at many levels. For instance, it is important in technology in order to create aesthetically pleasing PowerPoint presentations and multi-media displays that showcase work and make the information and facts presented memorable.

Some facts regarding working of brain

- The brain learns new information in chunks. Brain research states that children between the ages of 5 and 13 learn best when given chunks of 2 to 4 pieces of information. Children ages 14 and older can learn up to 7 chunks at a time. Teachers should plan for these limits and teach material in small chunks.
- The brain also works on a time schedule. Children ages 5 to 13 learn best in 5 -10 minute increments. Children 14 and older, learn in increments up to 10 – 20 minutes. Sometimes, teachers may extend time limits through positive reinforcement.

- Children learn best when a teacher teaches new material first and review previously learned material at the end of instruction.
- It is best for teachers to teach in short units (1 to 2 segments at a time) and then provide a student led activity time. Students need time to practice the skills they are learning.

Use of brain based learning while teaching in classroom

Teacher should keep in mind some of the following points in mind during teaching to enhance the learning in students.

- Students need a moment to “rest their brain” from a task. Allowing off-task time between lesson segments often increases a student’s focus. For example, allow students to take time to stand up and stretch, provide a 2-minute talk break, etc. By providing these moments, the brain will be more ready to stay on task and store information.
- Allow students to drink water during learning time. Research shows that dehydration causes higher salt levels in the blood which in turn raises blood pressure and stress. Dehydration also causes a loss in attentiveness and lethargy. Ideally, students should drink 6 to 8 glasses of water a day to be properly hydrated.
- Take advantage of students’ high energy time. There is a high-low energy level cycle that occurs during the school day. For example, most students have lower energy in the morning (especially during adolescence) and higher energy levels after lunch. A higher energy level correlates to an increased level of attention. Teachers should take advantage of the times during the day when the students’ energy levels are higher by teaching the most important material during these times.
- Provide adequate personal space for the students. More personal space reduces stress for a learner.
- Provide time at the end of a lesson to think about and discuss the topic. Understanding may not take place immediately, it may occur later.
- Processing time and reflection are vital to the learning environment

Conclusion: Brain based education consist of brain based learning and teaching. The teacher should make the learning environment fear free, give the space to the students, praise for their good work and studies, Students must feel physically and emotionally safe before their brains are ready to learn. Teachers can create a positive environment by encouraging and praising their

students' efforts. Considering the brain based principle , the working of brain , the functions of right and left brain duringteaching will enhance the achievement of students at any level.

References

- Caine, G., Nummela-Caine, R., & Crowell, S. (1999) *Mind shifts: A Brain-Based Process for Restructuring Schools and Renewing Education*, 2nd edition. Tucson, AZ: Zephyr Press.
- Caine, G., Nummela-Caine, (1997) *Education on the edge of possibility*. Alexandria, VA: ASCD-Association for Supervision and Curriculum Development.
- D'Arcangelo, M. (2000). How does the brain develop? A conversation with Steven Peterson. *Educational Leadership*, 58(3), 68-71.
- Jensen, E. (1998) *Teaching with the Brain in Mind*. Alexandria, VA: ASCD—Associationfor Supervision and Curriculum Development.
- Jensen,E. (2000) *Brain-Based Learning*. San Diego: Brain Store Incorporated.
- Jensen, E. & Johnson, G. (1994) *the Learning Brain*. San Diego: Brain Store Incorporated.
- Sousa, D. (2006, 2011) *How the brain learns*. Thousand Oaks, CA. Corwin Press.
- <http://www.cerconlearning.com/wholebrain.html>