TITLE: **"BRAIN-BASED LEARNING PROGRAM: A PEDAGOGICAL NEED"**

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ABSTRACT

The human brain is the epicentre, site of impact and the prime noticeable arena for all that is being done and conducted through classroom activities. This being the case, a foresight into the mechanism of the brain may be ushered as one of the most crucial area. Therefore, understanding how the brain works may be most relevant areas of research for the educators of tomorrow. The teasers in this direction paved the way forward towards the concept of Brain Based Learning (BBL) looking deeply and also attempting to bridge the evident divide between the fields of neuroscience and education furthering the emergence of new field in the genesis of Educational Neuroscience is the Engagement of Strategies that are based on the principles of how the brain is designed to learn naturally.

The present study aims to develop the effective BBL program developed by researcher for teaching. Presenting the brain based learning (BBL) principles and the various BBL strategies correlating it with parts of the brain and its function; the researcher for future prospects urge to apply this program and find its effectiveness in terms of its effect on achievement. This study mainly aims to shed light on difference when BBL strategies are implemented in classroom.

KEYWORDS

Brain Based Learning, Educational Neuroscience, Brain, Teaching-Learning Process, Science, Learning Strategies, Child-Centred Learning

INTRODUCTION

Education is the natural outgrowth of the human thirst to know oneself better combined with new technology that allows one to know about good teaching-learning practices. The nature and processes involved in learning are studied in many fields including educational psychology, neuroscience, and pedagogy. They lay the path for current research problems that are addressed today to devise better teaching tools.

Teachers have taught for centuries without knowing much about how the brain works. That was mainly because there was little scientific understanding and knowledge about the anatomy and physiology of the brain or credible evidence about the biology of the Brain. Research in such fields has led to the recognition of various sorts of learning taking place.

Everything you do uses the brain particularly for teaching learning processes. Understanding how the brain works are one of the most relevant areas of knowledge for educators today. The Brain remains an enormously complex wonder that still guards many secrets. In the context of Education, due to the great array of development, a large amount of insight has been gained that has implications for teaching and learning. All these development has led to the newer approach of teaching and learning, which is Brain-Based Learning .

The Principles of Brain-based Learning

The principles of Brain-Based Learning provide a theoretical framework and conceptual understanding for carrying out the effective teaching-learning processes, providing the idea of the best conditions under which learning takes place in the brain. Based on research evidences of neuroscience these principles are formulated.

It also guides educator to enrich the learning environments for learners accordingly. Renate and Geoffrey Caine have mentioned the core principles of brain-based learning in their book, "Making Connections: Teaching and the Human Brain (Caine & Caine, 1995)". Those interpreted by the researcher in view of studies are as follows:

1. ***The brain is processed parallelly.***
2. ***The Learning involves the complete physiology***
3. ***The search for meaning is eternal***
4. ***The search for meaning occurs through the means of patterning***
5. ***Emotions are critical to being patterned***
6. ***Each brain simultaneously perceives the information and creates parts and wholes***
7. ***Learning actively involves both the type of attention: focused attention and peripheral perception***
8. ***Learning inculcates both the processes: conscious and unconscious processes***
9. ***We have two types of memory in brain -A spatial memory system and a memory for Recalling***
10. ***When facts and skills are imbibed in natural spatial memory the brain understands and remembers best***
11. ***Learning is increased by challenges and stagnated by threat***
12. ***Every brain is unique***

EFFECTIVE BRAIN-BASED TEACHING STRATEGIES

The brain-based instructional process has its primary focus on understanding the learning process by synchronizing it with the brain's functionality. These instructional strategies lays the emphasis on what a learner is performing in the classroom and not on the kind of lecture prepared by the teacher. The learner and his learning process is the focus of brain based instructional strategies. In fact these strategies have been developed in a manner that all the developmental principles related to human brain are used practically thought of being implemented in classroom learning area.

Neuro-education has categorized brain based instructional strategies into three domains which are as under:

The main focus of **orchestrated immersion** is to make the gist of the subject meaningful and vivid in learners' minds. If learners grasp the gist through various sense organs, retention level of the provided information will be increased. Various strategies such as using music, visualization techniques etc. can be used for maximising involvement of the learners. It helps in patterning and associating the information perceived in pupils' brains.

The **relaxed alertness** implements such strategies that aligns to the comfortable environment that is to be provided to pupils for better learning. The environment should be such that it is meaningful as well as challenging to the learners. Learners need to feel secure and relaxed so that they can take up risks to undertake that challenge. Challenges shouldn't be felt as threat. This domain also help learner link previous knowledge to the new one.

Active processing it includes such teaching strategies that focus on learning of the content by active and conscious involvement of the learner in the classroom. Using mnemonics, chunking etc. are the best strategies. Apart from these, efforts made by learner in making creative aids for better learning are also part of active processing domain. Brain forms the meaningful patterns in the sequential way as and when the new information is processed.

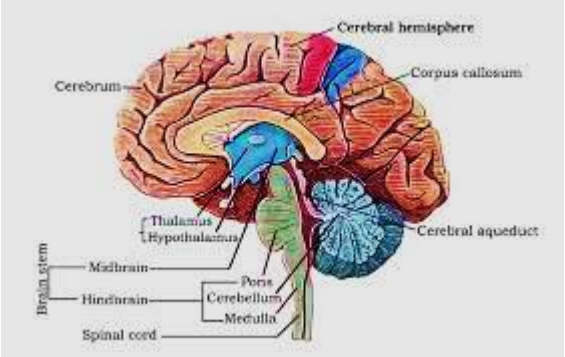
Learners make associations to link newly encountered information with previous learning and storing it for the further use. Learning based on these techniques helps the brain to build new connections and consolidate new information. Brain based instructions functions best with hands on interactive learning. BBIS provides academically a fear free environment resulting in superior understanding of the educational

material. These strategies Increase brain thickness, i.e., helps in growing the number of neurons, and the number of connections between neurons leading to increased plasticity of brain.

DESCRIBING AND CHUNKING BRAIN INTO PARTS

The Brain is the most complicated organ that exist, we know. Understanding about how it works is complex. As, everything we do is associated with our brain. And our brain is interconnected to everything else in our body. For the sole purpose of learning and understanding, we can differentiate brain into different manageable categories or chunks. Although, we affiliate various functions to these different parts of brain but we must remember that brain functions as whole.

When the canonical structure of the brain is viewed from different angles, interiorly and exteriorly and also from corners to edges; it can be concluded that brain can be categorised into mainly 3 parts: Fore Brain, Mid Brain and Hind Brain .



FORE BRAIN

Fore brain is the most crucial part of the brain due to the fact it is accountable for enacting all of the emotional, cognitive and motor functions. It can be broadly divided into four different components as:- Hypothalamus, Thalamus ,The Limbic system and Cerebrum.

Hypothalamus :

The hypothalamus is one of the smallest structures in the brain, however performs a important role in our behaviour. It regulates physiological processes concerned in emotional and motivational behaviour, consisting of eating, drinking, sleeping, temperature regulation, and sexual arousal. It additionally regulates and controls the inner surroundings of the body (e.g., heart rate, blood pressure, temperature) and regulates the secretion of hormones from various endocrine glands.

Thalamus:

It includes an egg-shaped cluster of neurons located on the ventral (upper) side of the hypothalamus. It is sort of a relay station that receives all incoming sensory signals from sense organs and sends them to suitable elements of the cortex for processing. It additionally gets all outgoing motor signals coming from the cortex and sends them to suitable parts of the body.

The Limbic System:

This system consists of a set of structures that form a part of the old mammalian brain. It enables in keeping internal homeostasis by regulating body temperature, blood pressure, and blood sugar level. It has close links with the hypothalamus. Besides hypothalamus, the limbic system incorporates the Hippocampus and

Amygdala. The hippocampus performs an essential function in long-term memory. The amygdala performs the critical function in emotional behaviour.

The Cerebrum:

Also referred to as Cerebral Cortex, this component regulates all higher stages of cognitive functions, including attention, perception, learning, memory, language behaviour, reasoning, and problem solving. The cerebrum makes -1/3 of the entire mass of the human brain. Its thickness varies from 1.5 mm to 4 mm, which covers the entire surface of the brain and incorporates neurons, neural nets, and bundles of axons. All these make it viable for us to carry out organised movements and create images, symbols, associations, and memories.

The cerebrum is split into symmetrical halves, referred to as the Cerebral Hemispheres. Although the two hemispheres seem identical, functionally one hemisphere normally dominates the opposite. For example, the left hemisphere normally controls language behaviour. The right hemisphere is normally specialized to address images, spatial relationships, and pattern recognition. These hemispheres are linked through a white package of myelinated fibres, known as Corpus Callosum that carries messages backward and forward among the hemispheres.

Cerebral cortex has also been divided into 4 lobes - Frontal lobe, Parietal lobe, Temporal lobe, and Occipital lobe.

The Frontal lobe is especially involved with cognitive capabilities, which includes attention, thinking, memory, learning, and reasoning, however it also exerts inhibitory effects on autonomic and emotional responses.

The Parietal lobe is in particular involved with cutaneous sensations and their coordination with visual and auditory sensations.

The Temporal lobe is generally involved with the processing of auditory information. Memory for symbolic sounds and words resides here. Understanding of speech and written language relies upon this lobe.

The Occipital lobe is in particular concerned with visual information. It is assumed that interpretation of visual impulses, memory for visual stimuli and colour visual orientation is accomplished via this lobe.

Physiologists and psychologists have attempted to discover unique functions related to particular brain structures. They have discovered that no activity of the brain is achieved only through a single part of the cortex. Normally, other parts are involved.

MID BRAIN

The Mid Brain is comparatively small in size and act as bridge between the fore brain and the hind brain. Reticular Activating System (RAS), essential part of midbrain that is responsible for arousal experiences. By regulating the various sensory inputs, it makes one alert and active. It also helps in scrutinizing information from the environment.

HIND BRAIN

The Hind Brain consists of following structures associated with various functions as described below:

Medulla Oblongata: Lowest part of the brain containing various neural centres that coordinates basic life supporting processes such as heart rate, blood pressure and breathing.

Pons: Neural centres of pons receives auditory signals from our ears and also are involved in the sleep mechanisms, especially sleeps which are characterized by dreaming. It also contains various neural centres that are responsible for respiratory movement and facial expressions also.

Cerebellum: The most advanced and developed part of the hind brain. It is responsible for maintaining posture and equilibrium of the body. The function is coordination of motor movements affiliated with various muscles. The particular motor commands originate in the fore brain but the cerebellum receives and disseminates them to the associated specific muscles. Once we learn how to walk, ride a bicycle etc. we don't have to recall it every time when we do. Hence, it also stores the memory of the various movement patterns performed.

DEVELOPED BRAIN BASED LEARNING PROGRAMME

Based on the various researches in the field of Brain Based Learning and Educational Neuroscience it can be concluded that human brain is not at all designed for formal instructions rather it tends to oppose orders and if enforced to do something. Traditional pedagogies of teaching learning processes that has always emphasised on imbibing the information as it has been spoon-fed, rote memorize those what is taught. There is greater need to shift from traditional teaching-learning to those teaching learning processes that are effective in terms of creating the thirst for learning and creating the rich learning environments wherein they learn themselves while enjoying the process of learning.

The brain-based learning (BBL) program was developed by inculcating the various brain-based learning principles devised by Caine and Caine, various Brain Based Teaching Strategies and also by understanding the various functions associated with different parts of brain, as the way those were interpreted by the researcher that are already mentioned above.

This provides the outline of the BBL programme designed. It includes the Corelation of various parts of the brain involved with different strategies, also keeping in view the BBL Principles and BBL Strategies that are suggested by various experts and researches in the field. Those were interpreted and co-linked with various strategies and different parts of the brain.

CONCLUSION:

To conclude, the whole and sole idea of this programme is to carry out the teaching learning process the way that leads to the learning of the brain naturally. Also, to catering the diversified needs of the individual keeping into view the inclusive classes. Using the brain friendly strategies help child learn better and also helps to draw the utmost potential and abilities hidden in the child. Challenging yet relaxed classroom would help learner expand their capacities and make them confident enough to withstand the challenges in the real world after their schooling. The program would lay the base of how the lessons can be planned for learners. The researcher has tried to actively use different parts of brain that would help learners process the learning as an outcome of brain functioning as the one whole unit. The activities and strategies can be modified according to the scenario of the classroom taking into consideration the age, culture and background of the learners coming from. Altogether, this framework of program would be useful for all those who are working in field of Educational Neuroscience, Education, Curriculum and Pedagogy Development. And further researches based on this would help to a great extent in policy making also. Moreover, its importance lays for educators and school academic planners.

"Great beneficiaries of BBL are the Learners"

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