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ORIGINAL ARTICLE

Development of Concept and Brain Hemisphericity amongst Undergraduate students of Chemistry.

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Abstract:

In this survey and co relational type of research, the brain hemisphericity dominance and concepts of chemistry were tested for undergraduate students of two colleges. These two groups of students showed marginal increase in integrated domain and conceptual understanding.

KEYWORDS:

Hemisphericity Dominance, Concepts.

INTRODUCTION:

In the past quarter of a century considerable attention has been given to what is called brain hemisphericity1. According to neurosurgeon Joseph Bogan, brain hemisphericity is the reliance on one mode of processing than another by an individual2. Roger Sperry, a Nobel laureate in physiology for his work on Hemisphericity, explained the nature of Hemisphericity3 this way:
"Each hemisphere...has its own...private sensations, perceptions, thought, and ideas, all of which are cut off from the corresponding experience in the opposite hemisphere. Each left and right hemisphere has its own private chain of memories and learning experiences that are accessible to recall by the other hemisphere. In many respects each disconnected hemisphere appears to have a “separate mind of its own."
These early brain researchers found that (1) the two halves of the brain, right and left hemispheres, process information differently; (2) in the split-brain patient, there seem to be two different people up there, each with his/her favorite ways of processing information, each with a different mode of thinking; and (3) both hemispheres are equally important.
Left versus Right Brain Thinking: The findings of these neurosurgeons had direct and obvious implications for teaching, especially for the growing field of student learning styles. Bernice McCarthy4, who has applied the results of brain research to the 4 MAT model of learning sees the two hemispheres processing information and experiencing differently. Here are some differences that she feels make a difference in helping to accommodate students with different learning styles.
One of the arguments that brain researchers make is that school learning emphasizes and favors "left" brain learning over "right" brain learning. If listening to lectures and relying on the science text book are left brain activities, then there is evidence to support this argument. For example, teachers who want to increase the number of right brain activities in their lesson plans, thereby giving right brain learners more of an opportunity for success would include such approaches as: mind-mapping, visualization experiences, imagery, analogies, use of paradox, role-playing, creative writing (yes, in science), demonstrations, experiments, intuitive activities, connecting ideas, and creative problem solving.
Implications from Research for Left/Right Brain: There is a tendency, as with any theory, to draw simplified interpretations, and so it is with brain functioning and student learning style. One of the major

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oversimplifications is that rationality is exclusively a left brain function, and creativity a right brain function. Evidence supports the idea that both hemispheres play a part in rationality and creativity. There are, however, some results that have powerful implications for you as a teacher,as follows.

Ann Howe and Poul Thompsen report that Hemisphericity can play an important role in motivation and science teaching. According to work being done in artificial intelligence, when a person is exposed to some new phenomenon, the first thing that occurs is that in the deep part of your brain you give a preliminary value to it: 'is it interesting or not?' If it isn't, the person doesn't give it any more attention. It is interesting then after 10 seconds or so it enters the right hemisphere, which attempts to make holistic sense of the phenomenon: 'what's all this about?' If this succeeds, then the information is processed to the left hemisphere where the brain tries to deal with analytically. This notion supports the contention that we must pay close attention to the types of tasks that we present to students. Interest is an important aspect of science teaching, and the gatekeeper seems to be the deep recesses of the brain.

Another finding that has implications for teaching has to do with the role of emotion or feelings. The right hemisphere seems to play a special role in emotion. If students are emotionally involved in an activity, then both sides of the brain will participate in the activity, regardless of the subject matter or content.

The two hemispheres are involved are involved in thinking, logic, reasoning and also in the creation and appreciation of art and music. This disputes earlier implications that the left brain was the logical side, and the right brain the artistic side.

Brain Hemisphericity and Thinking Styles: The human brain function in many ways acts as two brains--right and left hemisphere--and that is the way in which we experience the world and experience teaching is fundamentally affected by which hemisphere of the brain is dominant.

Style Differences between Right and Left Brain Learners

Left Hemisphere	Right Hemisphere
• Utilizes motor skills more effectively • Uses a more analytical approach to problem solving • Does not like change • Not creative in planning and organization • Typically have problems seeing the big picture • Usually unemotional in their approach to human relations	• Usually wants simple answers to complex problems • Prefers to think more holistically • Less organized than right brain learners • More spatially oriented and creative in solving problems • Tend not to follow through with details • Does not follow procedures-likes to do their way

In general, people typically prefer the thinking style of one side of their brain or the other, although some people may use each side equally. Therefore, it is important for instructors to have knowledge of their own brain Hemisphericity in order to identify advantages and disadvantages in their teaching techniques. In addition, knowledge of their own brain Hemisphericity can assist them in becoming more flexible and effective in teaching in the classroom.

DEFINITIONS OF HEMISPHERICITY:

An early unquantifiable definition - Hemisphericity referred to the idea that people rely on a preferred mode of cognitive processing that is linked to predominant activity of either their left or right cerebral hemisphere. Individual Hemisphericity was erroneously thought to be located somewhere on a gradient between right and left brain dominance with most people being intermediate.

A reconstituted and quantifiable definition of Hemisphericity, made possible by this work: Hemisphericity is the bias in thinking orientation, behavioral style, and personality resulting from the inherent laterality of one's sole executive system within the asymmetric bilateral brain. Thus, depending upon which brain side "the one and only you" inherently is located, one is either a left or a right brain oriented person. An L-bop's cognitive and behavioral orientation is top-down, self survival, important details view: a splitter. In contrast, an R-bop is biased toward a bottom-up, group survival, and global orientation: a lumper.

METHODOLOGY:

Learners from each college are given set of Brain Hemisphericity Test ref 3 and Concept Test for Chemistry.

Conceptual test designed tests general concepts of students about Chemistry.
The concept test for Chemistry was about basic properties of organic chemicals, different types of reactions, stereo chemistry etc. This test comprised of 20 objective type questions (each with four options), carrying one mark. Thus the maximum mark a student can get is 20. The test for Hemisphericity dominance comprises of 50 questions each with two options, namely A and B. Option A was representing right brain dominance while option B was representing left brain dominance. But if learner selects both the option then it represents integrated domain that is learner was able to use both the hemispheres equally. The development of hemisphericity and conceptual understanding was observed from first year to third year in two different colleges from Mumbai University.

OBSERVATIONS:

The development of Right brain, Left brain, and Integrated brain is shown here in percentage and average marks obtained in conceptual test are also given for respective classes

A: Right brain Hemisphericity, B: Left brain Hemisphericity, I: Integrated brain Hemisphericity.

Class	K J Somaiya College of Science and Commerce				Khalsa College			
	HDT (%)			Test /20	HDT (%)			Test /20
	A	B	I		A	B	I	
F Y B Sc	70	20	10	7.9	84	8	8	8.7
S Y B Sc	73	20	07	8.9	96	4	0	8.3
T Y B Sc	66	10	24	10.5	76	14	10	11.5

CONCLUSIONS:

The observations from this survey revealed the following conclusions
1) There is decrease in right brain Hemisphericity and increase in either left brain Hemisphericity or Integrated brain Hemisphericity from first year to third year of undergraduate studies.
2) Along with this change there is also increase in conceptual understanding amongst students.
3) For science subjects it is essential to have improved either left brain or integrated brain hemisphericity, as it means improved motor skills ability, analytical approach and could able to visualize bigger picture. This is what is observed amongst students. Thus it will be recommended that while designing the activities for undergraduate students one should design it so that left brain or more preferably the integrated brain hemisphericity should be improved. It was also observed in similar such surveys that improvement in left and integrated brain hemisphericity also affects the cognitive beliefs 5,6 of students.

REFERENCES:

1.) Hemisphericity dominance test developed by D Venkataraman (1994).
2.) Bogen, J. E. (1975). Some educational aspects of hemispheric specialization. UCLA Educator, 17, 24-323.
3.) Sperry, Roger W. (1975). Left Brain - Right Brain Saturday Review. August 9th, (p. 30-33).
4.) McCarthy, B. (1981, 1987) The 4MATsystem: Teaching to learning styles with right/left mode techniques. Barrington, 111.: Excel, Inc.
5.) J. K. Pendharkar; M. N. Nyayate (2011). Comparison of conceptual understanding of electromagnetism and physics expectancies between the students of Mumbai and Thane districts. Indian Streams Research Journal, Vol.I, Issue XI, 72-75.
6.) J. K. Pendharkar; M. N. Nyayate, Hema Peese Anushree Tambe (2012) Co relations between cognitive beliefs and dominance in brain hemisphericity of first year engineering students. Review of Research Vol.1 Issue IX.