



Human learning and Brain dominance

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ABSTRACT

This paper presents the preliminary results of a study conducted to investigate the relationship between brain dominance and learning styles. Data were collected from a sample of 300 high school students of Coimbatore district. Tools used were Brain-Dominance Questionnaire and Perceptual Learning Style Scale. Pearson's correlation coefficient was used to find out if there is any significant relationship between Brain-Dominance Questionnaire and Perceptual Learning Style. Statistical analysis revealed that there is significant relationship between hemispheric preference and learning style.

KEYWORDS

Brain dominance, Perceptual Learning Styles

Introduction

Human learning has been the most debated field in education scenario. How people think and learn is an area of interest not only for academicians and neuroscientists but even for the common man. We all know that each individual is unique and each one differs in the way of accommodating and assimilating information. This may be due to different factors. Of the factors learning style and brain hemispheric dominance contributes a major role. When thinking of brain based learning, which refers to teaching methods, lesson designs, and school programs that are based on the latest scientific research about how the brain learns, including such factors as cognitive development—how students learn differently as they age, grow, and mature socially, emotionally, and cognitively it is important that an investigation can be done on the brain dominance and learning style.

Based on these assumptions, an attempt was made to study the relationship between the learning style and brain dominance. The investigator studied the perceptual learning styles and brain dominance of 300 high school students of Coimbatore district.

Questions Guiding the Study

1. Do students enrolled in the high school have different preferences for hemispheric mode process (e.g. right, left or both)?
2. Do students enrolled in the high school have different learning styles?

Major objective

The study was conducted to examine the differences in brain hemispheric processing modes and learning styles among 300 high school students. Specifically, the study aims to investigate the relationship of brain dominance and learning styles of the students.

Literature review

Four centuries ago, Rene Descartes made a prophetic discovery. He discovered that the brain had a dual organizational structure. After 400 years of investigation, there is still disagreement as to the nature of human consciousness. However, owing to biological observations of scientists from Rene Descartes to Roger Sperry, and to recent advances in technology, the once mysterious relationship between the biological organization of the brain and human learning is, for the first time in history, "researchable." Today, clinical studies with "split-brain" patients (patients whose two hemispheres have been disconnected for medical reasons), and brain research on

normal adults and children using specially developed technologies like Magnetic Resonance Imaging (MRI), Electroencephalogram Scans (EEG), Dichotic Listening Tests and Blood Flow Maps confirm the following: (1) that the hemispheres of the human brain process information and experience in identifiably different ways; (2) that the neural organization in each hemisphere is complementary yet different; (3) that the corpus callosum, the bundle of nerve fibers connecting the two hemispheres of the brain, serves to integrate the actions of the hemispheres; (4) that hemispheric specificity and hemispheric disposition are quantifiable; and (5) that individual preferences for hemispheric integration have clear relationships to cognitive style, especially with regard to learning. (McCarthy, 1987).

Cognitive neuroscientists generally held that brain hemisphericity or brain dominance is the tendency of an individual to process information through the left hemisphere or the right hemisphere or in combination. It was brought out further that left hemispheric dominant learners are analytical, verbal, linear and logical, whereas those right-hemispheric dominants are highly global, visual, relational, and intuitive. Closely related to brain hemisphericity is the learning style or the preferred way in which individuals learn. (Ali, 2007.)

Methodology

The method used for the study was normative survey. Data were collected using 30-item Brain-Dominance Questionnaire (Indu and Haidy, 2008) and 30-item Perceptual Learning Style Preference Scale (Reid, 1987). Brain-Dominance Questionnaire and Perceptual Learning Style preference Scale were administered to the respondents. All items in Perceptual Learning Style preference Scale are of 5-point Likert scale, and each item receives a score in the range of 5 to 1. Thus a positive mean score indicates a preferred learning style. To carry out the analyses, product moment correlation was done.

Results of the study

From a total of 320 questionnaires administered, eighteen were incomplete and were subsequently discarded. Analysis revealed that 80 per cent of the sample were left-brain dominant whereas 20 per cent were right-brain dominant and the remaining students (n=2 i.e. 0.67 %) were whole-brain learners. As the whole-brain learners were very small in number, statistical tests were not conducted on this group. As a result all statistical analysis was carried out with the remaining 300 sample. The percentage analysis of students based on their hemispheric dominance and learning style preference is presented in Table 1.

Table 1. Classification of students based on Hemispheric dominance and Learning style preference

Brain Hemisphericity	Number of students	Percentage
Left Brain Dominant	240	79.4
Right Brain Dominant	60	19.9
Whole brain	2	0.7
Total	302	100

The 300 students who belong to the right or left brain dominant category were chosen for further analysis and their learning style preference were found and the results obtained are given in Table.2.

Table 2. Classification of students based on learning style preference

Learning style preference	Number of students	Percentage
Visual	129	43.0
Auditory	97	32.3
Kinesthetic	44	14.7
Tactile	30	10.0
Total	300	100.0

The data in Table 2 shows that most of the samples 43 per cent belong to visual learning styles (n=129), 32 per cent preferred auditory learning style and 14.7 per cent were of kinesthetic type and 10 per cent of the sample were found to prefer tactile type of learning.

Correlation analysis

Pearson's Product moment method was used to find out if there is any significant relationship between brain dominance and learning style preference. The analysis found that brain dominance had significant correlation with the four types of learning styles (Table 3).

Table 3. Correlation between Brain Dominance and Perceptual learning styles

Brain Dominance \ Learning Style	Visual	Auditory	Tactile	Kinesthetic
Left brain dominance	0.78**	0.73**	-0.69*	-0.71**
Right brain dominance	-0.76**	-0.71**	0.68*	0.70**

** Significant at 0.01 level * Significant at 0.05 level.

It is seen from Table 2 that visual and auditory learning styles are positively correlated to Left brain dominance and tactile and kinesthetic learning styles are positively correlated to right brain dominance.

Conclusion

Recent studies in cognitive science have revealed that when we learn our brain physically changes, and that after practicing certain skills it becomes increasingly easier to continue learning and improving those skills. This finding, that learning effectively improves brain functioning has potentially far-reaching implications for how schools can design their academic programs and how teachers could structure educational experiences in the classroom. Even though many activity oriented methods are used today for teaching, many institutions tend to favor the left-brained modes of learning, focusing on logical thinking, analysis, and memorization rather than right-brained modes such as feeling, intuition, and creativity, which needs immediate attention.

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