



BRAIN DOMINANCE OF HIGH SCHOOL TEACHERS

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Abstract

The present study aims to examine whether there was any significant difference in Brain Dominance of high school teachers in terms of certain demographic variables. In this study 'Survey Method' was employed. Data were collected with the help of adopted Alert Scale of Cognitive Style which was developed and standardized by Loren D. Crane (1989). The investigator has selected 207 teachers who were taking classes for IX and X standard from different high schools in Tenkasi Educational District as sample with the help of stratified random sampling technique. For analyzing the data, Mean, Standard Deviation, 't'-test and ANOVA were used. The findings show that (i) there is no significant difference in Brain Dominance of high school teachers in terms of professional qualification, religion, and community, and (ii) there is significant difference in Brain Dominance of high school teachers in terms of subjects taught and teaching experience.

Keywords: Brain dominance, Hemispheric dominance, Cerebral dominance.

INTRODUCTION

The human brain is the most complex integration centre of the body, weighs 1,300 grams (3 pounds) in a person of average and more than half of that mass consists of neurological cells. The normal human brain has 100 billions of interneuron, which contribute to humanness. The brain or cerebrum housed in a chamber of hard skull bones resembles the much-folded nut in the walnut shell. The cerebral cortex is the thin outer covering of the brain which seems to be the part of the brain responsible for the ability to reason, problem solve, perceive, think, plan, observe, concentrate, remember and imagine. In short, this accounts for the impressive capacity to process and transform information.

The cerebral cortex is only about one-eighth of an inch thick, but it contains billions of neurons, each connected to thousands of others. The predominance of the cell bodies gives the cortex a brownish-gray appearance. Because of this the cortex is often referred to as *gray matter*. Beneath the cortex are myelin-sheathed axons connecting the neurons of the cortex with those of other parts of the brain. The large concentration of myelin gives this tissue an opaque appearance, and hence it is often referred to as *white matter*. A longitudinal fissure divides the symmetrical halves of cerebrum into left and right cerebral hemispheres. Thus, many of the structures described below appear in both the left and right cerebral hemispheres. The similarity in structure is not entirely matched by similarity in function. The two hemispheres appear to be somewhat specialized in functions they perform (Lawrence, 2012). The following table shows the different functions of left and right brain.

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Table 1. Functions of Left and Right Brain

Si. No.	Left Brain	Right Brain
1.	Uses logic	Uses feelings
2.	Detail oriented	Big Picture oriented
3.	Facts rule	Imaginations rule
4.	Words and language	Symbols and image
5.	Present and past	Present and future
6.	Math and Science	Philosophy and religion
7.	Order/pattern perception	Spatial perception
8.	Knows objects' name	Knows object function
9.	Reality based	Fantasy based
10.	Forms strategies	Presents possibilities
11.	Practical	Impetuous
12.	Safe	Risk taking

SPLIT- BRAIN RESEARCH

This type of research had begun in 1961, by Joseph Bogen, a neurosurgeon. He studied the corpus callosum of a patient with severe epilepsy. The corpus callosum is a band of nerve fibers connecting the two cerebral hemispheres of the brain. After this type of surgery the two brains are unable to connect with each other, and each tends to operate independently. Although fewer than 100 split-brain operations have been done by him since 1961, he concluded the result as the split-brain patients cannot transfer the information from one half of the brain to other (Hellige, 1993).

As a result of research on split-brain a clear pattern of the difference between the two brain hemispheres has been emerged. The brain delegates its resources not only between its two hemispheres but also within each hemisphere. One particularly important factor appears to be the difficulty of the task; performance on cognitively difficult task is enhanced through cooperation between the hemispheres, whereas simple tasks are carried out more efficiently within a single hemisphere (Lawrence, 2012). The two hemispheres play different role themselves. The following table shows the various skills associated with left and right brain.

Table 2. Skills associated with Left and Right Brain

Si. No.	Left Brain	Right Brain
1.	Hand writing	Haptic awareness



2.	Symbols	Spatial relationship
3.	Language	Shapes and patterns
4.	Reading	Mathematical computation
5.	Phonics	Colour sensitivity
6.	Locating details and fact	Singing and music
7.	Talking and reciting	Art expression
8.	Following directions	Creativity
9.	Listening	Visualization
10.	Auditory association	Feelings and emotions

SIGNIFICANCE OF THE STUDY

Brain is the organ of learning, every part of the brain controls different functions of learning. Especially the two hemispheres play different role themselves. The left hemisphere appears to be specialized for language functions of speaking, reading, writing and understanding language and for analytical functions. The right hemisphere appears to be specialized for nonverbal abilities, musical abilities and perceptual and spatio-manipulative skills. The enhanced cooperation between both the hemispheres in the learning process is called *Brain Dominance*. It is also called Brain-Based Learning or Hemispheric Dominance or Cerebral Dominance (Lawrence, 2015). The different hemispheres of the brain i.e. brain dominance is responsible for the difference in teaching-learning activities in a classroom. In general the right brain dominated students enjoy the social aspects in class and might get bored easily. Left brain dominated students are in general good with numbers and enjoys science class. It is easy for them to remember dates and processes and have a good understanding of grammar and sentence structure (Vargas, 2013). But what happens when a teacher encounters a class of both left and right brained pupils? What kind of teaching style should he adopt, and how can he match it to the learning styles of entire audience? The same question arises in relation to the evaluation methods. In general, the methods of teaching, either graphic or verbal ways of representing information, personality characteristics of teachers distinctively affect learning and learners. What it is considered an appropriate method for most students, could be ineffective for others that could learn more easily with a different approach. However, the teaching style and the preferred methods for student evaluation depend every time on the personal characteristics of the teacher (Ghinea, et al, 2012). It is not only important for students to understand what learning styles work best for them, it is also important for teachers to understand their own neurological strengths and weaknesses so they too can successfully reach every student (Holbrook, 2011). For this reason, the investigator decided to examine the Teachers' Brain Dominance.



OPERATIONAL DEFINITIONS OF THE KEYTERMS

1. **Brain Dominance:** Brain dominance refers to a preference for using one hemisphere of the brain over the other hemisphere. Brain dominance refers to the extreme use of left or right or whole brain.
2. **High School Teachers:** High school teachers are the teachers who are handling classes for IX and X standards.

OBJECTIVE OF THE STUDY

- To find out whether there is any significant difference in Brain Dominance of high school teachers in terms of certain demographic variables - (1) professional qualification, (2) religion, (3) community, (4) subjects taught, and (5) teaching experience.

HYPOTHESES OF THE STUDY

1. There is no significant difference between B.Ed. and M.Ed. professional qualification of high school teachers in their Brain Dominance.
2. There is no significant difference among Hindu, Christian and Islam high school teachers in their Brain Dominance.
3. There is no significant difference among OC, BC/MBC and SC/ST community high school teachers in their Brain Dominance.
4. There is no significant difference between arts and science teaching high school teachers in their Brain Dominance.
5. There is no significant difference among the high school teachers with below 10 years, 11 to 20 years, and 21 and above years of teaching experience in their Brain Dominance.

METHODOLOGY

In this study 'Survey Method' was employed. Data were collected with the help of adopted Alert Scale of Cognitive Style which was developed and standardized by Loren D. Crane (1989). The investigator has selected 207 teachers who were taking classes for IX and X standard from different high schools in Tenkasi Educational District as sample with the help of stratified random sampling technique. For analyzing the data, Mean, Standard Deviation, 't'-test and ANOVA were used.

DATA ANALYSIS

H₀₁: There is no significant difference between B.Ed. and M.Ed. professional qualification of high school teachers in their Brain Dominance.

Table 3. Difference between B.Ed. and M.Ed. Professional Qualification of High School Teachers in their Brain Dominance

Professional Qualification	N	Mean	S.D.	Calculated 't' value	Table 't' value	Remarks at 5% level
B.Ed.	151	9.17	4.82	0.09	1.96	NS



M.Ed.	56	9.18	3.76
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From the above table, it is inferred that the calculated 't' value 0.09 is lesser than the table value 1.96 at 5% level of significance. Hence the Null Hypothesis is accepted.

H₀2: There is no significant difference among Hindu, Christian and Islam high school teachers in their Brain Dominance.

Table 4. Difference among Hindu, Christian and Islam High School Teachers in their Brain Dominance

Religion	Sum of Variation	Sum of Squares	MSV	df	Calculated 'F' value	Table 'F' value	Remarks at 5% level
Between		32.41	16.21	2	0.78	3.04	NS
Within		4233.32	20.75	204			

From the above table, it is inferred that the calculated 'F' value 0.78 is lesser than the table value 3.04 at 5% level of significance. Hence the Null Hypothesis is accepted.

H₀3: There is no significant difference among OC, BC/MBC and SC/ST category high school teachers in their Brain Dominance.

Table 5. Difference among OC, BC/MBC and SC/ST Category High School Teachers in their Brain Dominance

Category	Sum of Variation	Sum of Squares	MSV	df	Calculated 'F' value	Table 'F' value	Remarks at 5% level
Between		22.44	11.22	2	0.54	3.04	NS
Within		4243.29	20.80	204			

From the above table, it is inferred that the calculated 'F' value 0.54 is lesser than the table value 3.04 at 5% level of significance. Hence the Null Hypothesis is accepted.

H₀4: There is no significant difference between arts and science teaching high school teachers in their Brain Dominance.

Table 6. Difference between Arts and Science Teaching High School Teachers in their Brain Dominance

Subjects Taught	N	Mean	S.D.	Calculated 't' value	Table 't' value	Remarks at 5% level
Arts	97	9.98	4.80	2.42	1.96	S



Science	110	8.46	4.20
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From the above table, it is inferred that the calculated 't' value 2.42 is greater than the table value 1.96 at 5% level of significance. Hence the Null Hypothesis is rejected.

H₀₅: There is no significant difference among the high school teachers with below 10 years, 11 to 20 years, and 21 and above years teaching experience in their Brain Dominance.

Table 7. Difference among the High School Teachers with Below 10 Years, 11 To 20 Years, and 21 And Above Years Teaching Experience in their Brain Dominance

Teaching Experience	Sum of Variation	Sum of Squares	MSV	df	Calculated 'F' value	Table 'F' value	Remarks at 5% level
Between		207.58	103.79	2	5.22	3.04	S
Within		4058.15	19.89	204			

From the above table, it is inferred that the calculated 'F' value 5.22 is greater than the table value 3.04 at 5% level of significance. Hence the Null Hypothesis is rejected.

FINDINGS AND INTERPRETATIONS

1. There is no significant difference between B.Ed. and M.Ed. professional qualification of high school teachers in their Brain Dominance.
2. There is no significant difference among Hindu, Christian and Islam high school teachers in their Brain Dominance
3. There is no significant difference among OC, BC/MBC and SC/ST category high school teachers in their Brain Dominance.
4. There is significant difference between arts and science teaching high school teachers in their Brain Dominance. That is, the arts teaching high school teachers (M=9.98) are better than the science teaching (M=8.46) high school teachers.

't' test result reveals that there is significant difference between Arts and Science teaching high school teachers in their level of Brain Dominance. The teachers teaching science subject are better than the arts subject in their brain dominance. It may be due to the fact that science teachers would be more rational and less emotional in their approach due to the influence of the nature of their teaching subjects.

5. There is significant difference among the high school teachers with below 10 years, 11 to 20 years, and 21 and above years teaching experience in their Brain Dominance. That is, 11 to 20 years teaching experience having teachers (M=10.24) are better than the below 10 years (M=8.16) and 21 and above years (M=8.39) experience having teachers.

ANOVA test result reveals that there is significant difference among high school teachers who have the teaching experience with below 10 years, 11 to 20 years and 21 and above years in their Brain Dominance. The teachers with 11 to 20 years teaching experience are better than



the below 10 years and 21 and above years experience in their brain dominance. It may be due to the fact that the teachers with below 10 years experience are less experienced while the teachers with 21 and above years experience is almost at the stage of burn out and eventually the teachers with 11 to 20 years are more strategic with the aspiration for further excellence monetarily and professional benefits.

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