



## Knowledge and Beliefs of Teachers Towards Brain Based Learning

### KEYWORDS

Teachers knowledge, Beliefs, Brain Based Learning

**Jayalakshmi Ramakrishnan**

**Dr.R.Annakodi**

PhD Research Scholar (UGC – Junior Research Fellow),  
Department of Education, Avinashilingam Institute  
for Home science and Higher Education for Women,  
Coimbatore.

Associate Professor, Faculty of Education,  
Avinashilingam Institute for Home Science and Higher  
Education for Women, Coimbatore-108

**ABSTRACT** *This study investigates the knowledge and beliefs of teachers towards the new discipline Brain based learning. 50 teachers participated in the study. Data were gathered using Brain-Based Learning Survey Questionnaire (BBLSQ). The instrument used in this study is an adopted version of the Brain-Based Learning Survey Questionnaire (BBLSQ), originally developed by Shelly Klinek (2009). The conclusions drawn from this study provide a positive view on teachers knowledge and beliefs towards brain-based learning. There is significant difference in teachers knowledge and beliefs towards brain-based learning based on gender and years of teaching experience. There is no significant difference in teachers knowledge and beliefs towards brain-based learning on the basis of type of school.*

### Introduction

Brain-based learning theory is based on the structure and function of the brain. As long as the brain is not prohibited from fulfilling its normal processes, learning will occur. Brain-based learning has hatched a new discipline now entitled by some as educational neuroscience, or by others as mind, brain, and education science (Sousa, 2011). It is a comprehensive approach to instruction using current research from neuroscience and 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 varying developmental stages.

Renate and Geoffrey Caines' 12 Brain/Mind Learning Principles are intended to provide educators with a framework for selecting different approaches to maximizing learning in students. These principles increase teaching options, and serve as a guide to educators already working to implement brain-compatible teaching practices (Denton, 2010).

### Core Principles Directing Brain-Based Education Are:

Caine and Caine (1991) developed twelve principles that apply what we know about the function of the brain to teaching and learning. The principles are:

- The brain is a parallel processor.
- Learning engages the entire physiology.
- The search for meaning is innate.
- Four: The search for meaning occurs through "patterning."
- Emotions are critical to patterning.
- Every brain simultaneously perceives and creates parts and wholes.
- Learning involves both focused attention and peripheral perception.
- Learning always involves conscious and unconscious processes.
- We have at least two types of memory -a spatial memory system and a set of systems for rote learning.
- The brain understand and remembers best when facts and skills are embedded in natural spatial memory.
- Learning is enhanced by challenge and inhibited by threat.
- Each brain is unique.

For complex learning to occur, Caine and Caine have identified three conditions:

### Relaxed alertness

An effort is made to eliminate fear, while maintaining a highly challenging environment. Children are stretched to maximize their cognitive potentials in teaching environments that are supportive, comfortable, and non-threatening.

### Orchestrated immersion

Orchestrated immersion in complex experiences means that, as a teacher, sits down ahead of time and works out the lesson. "Complex experiences" means that they are interacting, the learning is activity-oriented; they are globally searching for meaning and using the library for resources.

### Active processing

The learner consolidates and internalizes information by actively processing it. Information is intentionally connected to prior learning. This also requires time to reflect on materials that have been presented. (Jensen; Caine & Caine) Active processing is metacognition.

### Purpose of the Study

The purpose of this study was to determine the classroom knowledge and beliefs of teachers towards Brain-Based Learning, taking individual and demographic characteristics like gender, years of teaching experience and type of school.

### Significance of the Study

The importance of understanding how the brain retains knowledge can allow teachers to better engage students in learning (Jensen, 2008). Furthermore, academic achievement has been linked to teachers' beliefs about the learning process (Behar-Horenstein, Pajares, & George, 1996; Fenstermacher, 1979; Harris, 2008), and those beliefs impact how teachers address the learning process (Bolliger, & Martindale, 2004; Yair, 2000). One of the first steps to implementing these best-practice approaches is to get a better understanding of what teachers already know about brain-based learning strategies.

### Research Questions and Hypothesis

**Research questions addressed in this study were as follows:**

- What is the extent of knowledge and beliefs teachers have towards brain-based learning?
- Does the Knowledge and beliefs of the teachers toward Brain-Based Learning differ according to gender, years of

teaching experience and type of school?

**Hypothesis formulated in this study is as follows:**

The teachers’ knowledge and beliefs towards Brain-Based Learning did not differ based on gender, years of teaching experience and type of school.

**Participants**

The participants were 50 teachers of Coimbatore city in Tamil Nadu, India. The sample were selected by stratified random sampling method, giving due representation to factors like gender, years of teaching experience and type of school.

**2.3 Instrumentation**

The data were collected through a rating scale consisting of 20 items measuring Knowledge and beliefs towards Brain-Based Learning on a strongly agree to strongly disagree scale. The instrument, Brain-Based Learning Survey Questionnaire (BBSQ), originally developed by Shelly Klinek (2009). The internal consistency of each scale on the original BBSQ were as follows; Knowledge Scale,  $\alpha = .79$ , Belief Scale,  $\alpha = .86$  (Klinek, 2009).

**2.4 Procedure**

After the explanation of the purpose of the study, the rating scale was administered to the school teachers.

**Data Analysis**

**Preliminary Analysis of the Data**

The statistical constants, arithmetic mean, median, mode, standard deviation, skewness and kurtosis were worked out for the variable, ‘Knowledge and Beliefs towards Brain Based Learning’ for the total sample. This preliminary analysis was done to find out whether the total sample was normally distributed or not with regard to the variable ‘Knowledge and Beliefs towards Brain Based Learning’.

**TABLE 1  
BASIC STATISTICS OF KNOWLEDGE AND BELIEFS TOWARDS BRAIN BASED LEARNING FOR THE TOTAL SAMPLE**

Mean	Median	Mode	SD	Skewness	Kurtosis
80.28	82	87	6.972	-0.7997	0.963

Table 1 clearly indicates that the distribution of the variable ‘Knowledge and Beliefs towards Brain Based Learning’ for the total sample follows normal distribution with slight variations.

**STATISTICAL ANALYSIS**

The statistical analysis was conducted in two sections. At first, the percentage of Knowledge and Beliefs towards Brain Based learning of the whole sample and that of the sub samples were estimated separately. The estimation of the percentages of the sub samples were based on categories like gender (male & female), years of teaching experience (above 5 years & below 5 years) and type of school (Government & Private).

Secondly, each of the means thus obtained was compared between equivalent sub samples, by testing the significance of difference in means by finding out the ‘t’ value.

Estimation Of Level Of ‘Knowledge And Beliefs Of Teachers Towards Brain Based Learning’ For The Total And The Sub Samples.

**TABLE 2  
PERCENTAGE OF ‘KNOWLEDGE AND BELIEFS OF TEACHERS TOWARDS BRAIN BASED LEARNING FOR THE TOTAL SAMPLE AND THE SUB SAMPLES.**

Sample	N	% in sample	% in Population
Total sample	50	84.18	74.06 -94.29

Gender	Male	20	82.65	66.05 - 99.25
	Female	30	74.7	59.14- 90.26
Years of teaching experience	Above 5 years	25	82.8	68.01 - 97.59
	Below 5 years	25	77.76	61.46 - 94.06
Type of School	Govt.	23	81.78	66.01 - 97.56
	Private	27	79	63.64-94.36

From the analysis the investigator could reach at the conclusion that all the selected samples of teachers have a positive view on knowledge, beliefs towards brain-based learning as the percentages obtained for the samples are 70 and above.

**Comparison Of Sub Samples For Knowledge And Beliefs Towards Brain-Based Learning**

**TABLE 3**

**KNOWLEDGE AND BELIEFS OF TEACHERS BASED ON GENDER YEARS OF TEACHING EXPERIENCE AND TYPE OF SCHOOL**

Variable		N	Mean	SD	t value
Gender	Male	20	79.02	6.539	2.26*
	Female	30	74.7	6.758	
Years of teaching experience	Above 5 years	25	82.2	5.401	2.39*
	Below 5 years	25	77.76	7.540	
Type of School	Govt.	23	81.78	5.908	1.45 <sup>NS</sup>
	Private	27	79	7.641	

**SD- Standard deviation NS-Not significant**

**\*- Significant at 5% level**

From Table 3, it is clear that the ‘t’ value for Knowledge and Beliefs towards Brain Based Learning between male and female teachers is 2.26. It indicates that there is significant difference in Knowledge and Beliefs of teachers towards Brain Based Learning between male and female teachers at 0.05 level.

The ‘t’ value for Knowledge and Beliefs of teachers towards Brain Based Learning with respect to years of teaching experience is 2.39. It indicates that there is significant difference in Knowledge and Beliefs of teachers towards Brain Based Learning with regard to years of experience (above 5 years and below 5 years) at 0.05 level.

The ‘t’ value for Knowledge and Beliefs of teachers towards Brain Based Learning with respect to type of school is 1.45. It indicates that there is no significant difference in Knowledge and Beliefs of teachers towards Brain Based Learning with regard to type of school at 0.05 level.

**MAJOR FINDINGS**

- All teachers had a positive view on knowledge and beliefs towards brain-based learning (70 percentage and above).
- There is significant difference in knowledge and beliefs towards brain-based learning on the basis of gender.
- There is significant difference in knowledge and beliefs towards brain-based learning on the basis of years of teaching experience.
- There is no significant difference in teachers knowledge and beliefs towards brain-based learning based on type of school.

**Conclusion**

The conclusions drawn from this study provide a positive view on teachers knowledge and beliefs towards Brain-Based Learning. The results indicate that teachers are interested in how students learn best. Teachers should be experts on the brain (Jensen, 2005), and be trained as such. When effective teaching strategies are used, students are being taught to their preferred learning styles, teachers are confident in their methods and abilities, and the overall school climate is improved.

**REFERENCE**

- Behar-Horenstein, L., Pajares, F., & George, P. (1996). The effect of teachers' beliefs on students' academic performance during curriculum innovation. *The High School Journal*, 79(4), 324-332. | Bolliger, D. U., & Martindale, T. (2004). Key factors for determining student satisfaction | in online courses. *International Journal on E-Learning*, 3(1), 61-67. | Caine, R. N., & Caine, G. (1994). *Making connections: Teaching and the human brain*. Lebanon, IN: Dale Seymour. | Denton, V. (2010). A case study on the professional development of elementary teachers related to brain research and the strategies used to help struggling readers. (Doctoral dissertation). Available from ProQuest Dissertations and Thesis database. (UMI No. 3415926) | Jensen, E. (2000). *Brain-based learning: A reality check*. *Educational Leadership*, 57(7), 76-80. | Jensen, E. (2005). *Teaching with the brain in mind*. (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development. | Jensen, E. (2008a). A fresh look at brain based education. *Phi Delta Kappan* (89)6, 408- 417. | Jensen, E. (2008b). *Brain-based learning: The new paradigm of teaching*. Thousand Oaks, CA: Corwin Press. | Klinek, S. (2009). *Brain-based learning: Knowledge, beliefs, and practices of college of education faculty in the Pennsylvania state system of higher education*. (Doctoral dissertation). Available from ProQuest Dissertations and Thesis database. (UMI No. 3352427) | Sousa, D. A. (2006). *How the brain learns*. Thousand Oaks, CA: Corwin Press.