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## Effect of Brain Based Learning on the Academic Achievement and Metacognition of Elementary Level Students

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### Abstract

*Teaching-learning is a process of interpersonal interaction. More the interaction potential better are the outcomes. Thus, the effectiveness of any teaching activity depends on the extent to which it stimulates students. Brain-Based Learning is a set of principles in which the learning process is based on knowledge about brain structure and functions and on scientific results in cognitive of neuroscience about the most effective and appropriate ways of learning for the brain. The present study focussed on how brain-based learning effects the academic achievement and metacognition in elementary students. For this study quasi-experimental research method is used, sample of this research is divided into two groups one is controlled group (n-30) and another is experimental group (n-30). The findings of the study show a significant effect of brain-based learning on academic achievement and metacognition of elementary level students.*

**Key words** – Brain-Based Learning, academic achievement, metacognition, elementary students etc.

### Introduction

Brain-based learning is a comprehensive approach to instruction based on how current research in neuroscience suggests the brain learns naturally. This theory is based on what we currently know about the actual structure and function of the human brain at varying developmental stages. Using the latest neural research education that is brain-based provides a biologically driven framework for creating effective instruction. This theory also helps explain recurring learning behaviours and is a meta-concept that includes an eclectic mix of techniques. Currently, related techniques stress allowing teachers to connect learning to students' real life and emotional experiences. An innovative practice can set up a knowledge centre in the educational institutions. New methods of teachings are of vital importance to the future developments of the students. The innovative methods of teaching take hold of the traditional system more powerful and dominating, moreover it prepares the learners according to the demands of the global world.

Teaching and learning are inextricably and elaborately linked. To reach well implies learning about students learning and so for a teacher, learning and teaching are constantly interchanging activities. One learns by

teaching; thus, one cannot teach except by constantly learning. Good teaching involves striving continually to learn about student's understanding and the effects of teaching on it. Moreover, it lies in the connection between the student's understanding and the effects of teaching on it. Good teaching and good learning are linked through the student's experiences of what we do. It follows that we cannot teach better unless we are able to see what we are doing from student's point of view.

The challenges in education are to determine what makes an enriched classroom environment. Brain research validates that learning should be individually specific and is a natural function of the brain. An analysis of the body of empirical work on this topic shows that this area is one of the most remarkable and fertile areas of theory, research, and practice. A careful review of the earlier works carried out in the field indicates that there is not much work that has been done in this area of study. A further analysis revealed that tiny work has been done in India. Hence the investigator realized that any meaningful attempt in this regard will help teachers as well as students to keep them abreast with the research outcomes.

### Statement of the Problem

The problem is entitled as Effect of Brain Based Learning on the Academic Achievement and Metacognition of Elementary level students.

### Objectives of the Study

1. To study the effect of Brain-Based Learning on Academic Achievement of students.
2. To study the effect of Brain-Based Learning on Metacognition of students.

### Hypotheses of the Study

1. There is no significant effect of Brain Based Learning on the Academic Achievement of the elementary level students.
2. There is no significant effect of Brain-Based Learning on the Metacognition of elementary level students.

### Variables of the Study

The variables of the following study are: Independent variable: Brain-Based Learning.

Dependent variables: Academic Achievement and Metacognition.

Control variables: Age, Class, School, Environment, Duration of study, Teacher, and Previous Academic Achievement.

### Delimitations of the Study

The study was delimited in the following aspects:

1. The study is limited to Agra city only.
2. The study is limited to English medium schools only.
3. The study is conducted on 8th class students only.

### Research Method

A research method is a systematic plan for conducting research, in this research quasi-experimental research method is used. The sample is divided into two groups i.e. controlled and experimental.

### Sampling Technique

In this research the purposive sampling technique is used for selection of school and in selection of students for controlled and experimental groups the random sampling technique is used. For sample 30-30 students for both groups was selected from class 8<sup>th</sup> by using lottery method.

### Tools of Study

Following tools are used for this research-

1. Achievement Test- constructed by researcher
2. Metacognitive Awareness Inventory- constructed by Sindhu P.G. (2011)

### Statistical Techniques

Following statistics is used in this research

Descriptive- mean and standard deviation

Inferential- t- test

### Research Design of the Study

The Research design is the detailed plan of the investigation. In fact, it is the blueprint of the detailed procedure of testing the hypothesis the obtained data.

Groups	Pre-treatment phase	Intervention (Treatment phase)	Post-treatment phase
Control Group (N=30)	Self-constructed pre-test (Science Achievement Test) □ Meta-cognitive Awareness Inventory (MAI)	10 lesson plans were taught by using traditional method.	Self-constructed post-test (Science Achievement Test) □ Meta-cognitive Awareness Inventory (MAI)
Experimental Group (N=30)	□ Self-constructed pre-test (Science Achievement Test) □ Meta-cognitive Awareness Inventory (MAI)	10 lesson plans were taught using Brain-Based learning strategies. • Brain-Based learning activities was conducted according to lesson plan daily.	Self-constructed post-test (Science Achievement Test) Meta-cognitive Awareness Inventory (MAI)

### Findings of the Study

The findings of the study is based on testing of hypothesis, which are as follows-

Ho-1-There was no significant effect of Brain Based Learning lesson planning on academic achievement of Elementary level student in the subject of science.

The t-value of post test scores of the total group was found 3.28 with degree of freedom 58 and on 0.01 and 0.05 level of significance. The table value was found to be 2.00 and 2.66 which is less than the calculated value, hence we can say that there is a significant effect of Brain Based Learning on academic achievement of students.

Ho-2- There was no significant effect of Brain Based Learning lesson planning on Metacognition of Elementary level student in the subject of science.

The t-test value of post test scores of the total group was found 8.71 with degree of freedom 58 and on 0.01 and 0.05 level of significance. The table value was found to be 2.00 and 2.66 which is less than the calculated value, hence we can say that there is a significant effect of Brain Based Learning on metacognition of students.

### Educational Implication of the Study

In our traditional views of learning, the learner is seen as a passive individual whose major role is to assimilate information 'dashed' or 'poured' out by the 'all knowing' classroom teacher. He is expected to exhibit behaviours that align with the intended outcomes. The influences of various teaching methods on the academic achievement of the students have been documented in the literature for more than two decades. It is important to recognize and implement most effective child centered methods to ensure learning.

The paradigm shifts from teacher centered methods to child centered methods has made way too many innovations in the methodology of teaching. One such learner centered approach is Brain Based Learning.

The educational implications of the Brain Based Learning are:

- Facilitating learning through interaction an exchange of views among students
- themselves and with the teacher.
- Applicability of Brain Based Learning to the teaching-learning process.
- Enabling the students to engage in Brain Based Learning.
- Enabling the application of theoretical knowledge to real-life problems, thus
- Enhancing students' learning.
- Making the classroom more democratic.
- The student plays a central role in mediating and controlling learning.
- Activities, opportunities, tools, and environments are provided to encourage
- metacognition, self-analysis-regulation, reflection, and awareness.
- Teachers serve in the role of guides, monitors, coaches, tutors, and facilitators and thus create a friendly teaching-learning environment.

### Conclusion

In drawing conclusion, the attention shifts to the emerging teaching-learning methodologies in the learner-centered education. Though the limitations of the traditional teaching are apparent, nowadays some skills such as updating, practicing, criticizing, and analysing the knowledge are gaining importance. The Brain-Based Learning principles which plays an important role in the field of education recently arouses the interests of the experts in the field of science teaching in terms of designing a curriculum which enables the students to learn through practicing,

problem solving and decision-making. In a Brain-Based Learning classroom, the teacher assumes the role of a facilitator and guide. Teacher becomes the manager and not the controller of the class. Students take the responsibility of their own learning. They question, state problems, design experiments and discuss their results with others. Students construct knowledge and do not receive knowledge as passive learners. Education today is changing from one of factual based to one of inquiry based. This new approach to learning is bringing about new ways in which students are involved in the learning process.

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