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## BRAIN BASED LEARNING: COMPREHENSIVE REVIEW

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### **Abstract:**

*The review of related literature is an essential backbone and an important prerequisite of any research studies. It provides a comprehensive view of the topic, its relevance, significance and practicability. In this paper, the researcher has presented a review of studies carried out in abroad as well as India, in the field of brain based learning. From this it is understood that brain based learning focuses on concepts that create an opportunity to maximize attainment and retention of information. Also it can be applied to the learning process to understand the structure of the brain by considering the needs and styles of learners, to evaluate and improve the course format, and content delivery. Furthermore, the outcome of these studies reveal that brain based learning has significant impact on the achievement, performance, and overall development of the students.*

### **Introduction:**

The **Review of Related Literature** is an essential backbone and an important prerequisite of any research studies. It provides a comprehensive view of the topic, along with its relevance, significance and practicability. For any researcher, it is highly desirable that he/she should acquire up-to-date information about what has been done in the area of interest from which he/she intends to take up a problem for research. The review of related literature serves as a background for the present investigation and helps in understanding it in proper perspective. Herein, the investigator presents and discusses the related literature on brain based instructional practices. Brain based learning offers a framework to enhance student learning and application of brain research finds a wide coverage in the instructional design.

**Saleh (2012)** has conducted a study to find out the effectiveness of the brain based teaching approach in enhancing scientific understanding of Newtonian Physics among standard four students. The technique was implemented based on the brain based learning principles developed by Caine and Caine (1991, 2003). The author has addressed the research question, is the brain based teaching approach effective in enhancing students' scientific

understanding of Newtonian Physics in the context of standard fourth Physics subject? The experimental research performed on 100 students selected from two secondary schools in Malaysia. Data collected from the questionnaire of subjective items of Newtonian Physics was analyzed qualitatively to investigate the patterns formed. The findings of the research revealed that the teaching approach was effective in enhancing students' scientific understanding of Newtonian Physics. It was found that a majority of students from the group that followed the brain based teaching approach possessed a better scientific understanding of the selected topic as compared to the group that received conventional teaching method

**Wachob (2012)** has carried out a survey on the knowledge, perception and implementation of brain based learning practices among public school teachers. The survey was mainly addressed to explore (i) What is the extent of knowledge based learning and brain gym? (ii) To what extent do the public school teachers report implementing brain based learning indicators in the classrooms? (iii) What is the relationship between the public school teachers' level of knowledge of brain based learning and indicators of brain gym and their beliefs about brain based learning? (iv) What is the relationship between gender, years of teaching experience and teachers' knowledge, perceptions and implementation related to brain based learning?

**Kiedinger (2011)** has examined the influence of brain based learning on reading outcome in elementary aged students. The research objective deals with understanding the effects of brain based learning practices on students as measured by the Reading Assessment from the Wisconsin Knowledge and Concepts Examination (WKCE). For this study, a survey method was designed by the researcher and distributed to the faculty of the students in grades three, four and five. The study found an increase in reading scores as measured by the WKCE. The most significant change originated in students on the lower end of the continuum. This was attributed to the current understanding that students scoring proficient or advanced had brains that were more efficient at the task of evaluating and analyzing text; therefore, the brains of these students did not require the extra enrichment provided by brain-based learning. However, for students at the lower end of the continuum, brain-based learning necessitated an increase in scores. There was positive correlation between brain-based learning strategies and expected student achievement for these students

**McNamee (2011)** has studied the impact of brain based instruction on reading achievement in a second grade classroom. The research was aimed at "to determine whether the students who participated in a literature unit based on brain research have improved reading achievement or not? An experimental group of 25 second grade students participated

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in the brain based literature unit, where as the control group of 19 second grade students participated in traditional teaching practices. The performance was measured by the Sunshine State standards Reading Diagnostic Assessment (SSSRDA). After the SSSRDA was administered as the pre test, the experimental group participated in the 12 week intervention while the control group received traditional reading instruction. There was positive correlation between brain-based learning strategies and expected student achievement for these students.

**Duman (2010)** has investigated the effects of brain based learning on the academic achievement of students with different learning styles. The research questions undertaken were, (i) How is the learning style distribution of the students in the group? (ii) Are there any significant differences between the effects of brain based learning approach on the academic achievement of the experimental group students? (iii) Are there any significant differences among the academic achievement levels of the students in the experimental group depending on the learning styles? (iv) Are there any significant differences between the academic achievement of the experimental and control groups according to different learning styles? The researcher has adopted following methodology. A pre test- post test experimental group design was used for the study. The sample for the study consists of 68 teacher education students. Data were collected by using academic achievement tests and the Kolb Experiential Learning Style questionnaire. The findings of the study revealed that the Brain Based Learning approach used in the experimental group was more effective in increasing student achievement than the traditional approach used in the control group. However no significant difference was observed among the achievement levels of the experimental group students with different learning styles.

**Morris (2010)** examined the implementation of brain based instructional strategies by teachers serving at elementary, middle and high schools. The study was designed to determine (i) The extent to which teacher applied brain based strategies. (ii) The differences in application of brain based strategies among teachers. (iii) The differences among the use of brain based strategies and years of teaching experience (iv) the difference in the use of brain based strategies among teachers with and without National Board Certification. In the present work, the data for the study were collected using a teacher survey by stating 460 teachers serving at schools. The data provided a broad perspective regarding teachers' implementation of brain based instructional practices in the classroom environment. Quantitative research Methods were applied for the study. From the results it was found that elementary teachers applied more of the surveyed brain based practices than middle or high school teachers. Also

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teachers with 0-10 years of experience used significantly fewer of the surveyed brain based practices than teachers with more experience.

**Hutchins (2009)** conducted a qualitative multi-site case study on three elementary schools in the State of Georgia that utilize brain based instructional strategies in the educational process. The research objectives were (i) To increase the understanding of the philosophical foundations of brain based learning and how it is being used in conjunction with or opposed to other instructional strategies. (ii) To gain in-depth knowledge of the teaching strategies and construct meaning by investigating brain based learning in real life contexts- the classrooms and (iii) To develop theoretical explanation of brain based learning. The researcher has gathered perceptual data by observation, interview, video recordings and questionnaires and analyzed through identification of themes and patterns. The results indicated that some teachers and administrators believed brain based learning will not survive the No Child Left Behind initiatives, which forces teachers to focus on standardized testing. The data indicated that brain based learning is still a questionable practice and further empirical research is warranted. The case study often a holistic account of teacher and administrator perception of brain based learning and constructs meaning that assist future researchers to plan studies of these teaching methods. Conclusion

The investigator reviewed last five years of studies related to the topic brain based learning. From this it is understood that brain based learning focuses on concepts that create an opportunity to maximize attainment and retention of information. Also it can be applied to the learning process to understand the structure of the brain by considering the needs and styles of learners to evaluate and improve the course format and content deliver.

**Wiils J (2007)** has studied the effect of brain based teaching strategies on student memory, learning and test taking success. The study showed that brain based teaching strategies improves student memory, learning and test taking success.

**Dilek E and Rahmi Y(2005)** have studied impact of brain based learning approach on student's achievement and retention of knowledge. The authors have investigated the effect of brain-based learning approach on 7th grade student's achievement and retention of knowledge about "work-energy". The study revealed that brain based learning approach has a significant impact on the achievement and retention of knowledge.

**Davis L (2004)** has studied the use of brain based learning to increase fourth grade students academic achievement in science. It is observed that, with the implementation of brain based learning, the students displayed appropriate behavior and positive attitude

towards learning leading to significant improvement in student's achievement, behavior and self esteem.

**Jensen E (2000)** in "Brain-based Learning: A Reality Check" comments that although neuroscience has much to offer teaching and learning conceptualizations, educators must be cautious about applying lab research to classrooms. Brain research seems hazy, confusing, and contradictory because it is new and myths about synapses, low-stress learning, memorization, enrichment, and learning styles should be expose.

**Ernald J (2000)**, has carried out a study on effectiveness of brain based learning on low achievers of fourth grade students has been reported. The results of the study showed that brain based learning has a favorable effect in terms of student achievement.

**Ms. Rekha Chavhan (2012)** has developed an intervention programme based on brain based learning strategies to enhance self esteem, attitude towards learning, and reduce academic stress. It is observed that the intervention programme has helped in increasing the achievement of the students, enhancing the self esteem of the students. Furthermore, the programme facilitated reducing the stress level of the study and developing positive attitude towards learning.

**Panase Shruti (2012)**, has performed research work involving development of brain based program for enrichment of oral communication of standard deprived students has been carried out . The findings of the study showed that the brain based prsogram prepared and implemented is very much effective in enriching oral communication of the deprived students. Students communicate more effectively when brain based principles such as ,joyful atmosphere, cognition, emotions, sensory inputs, whole brain learning, music environment , imagination, creativity are used

**Ms Anita Sharma, (2013)** has carried out research study entitled 'Effect of BBL instructional strategies on Achievement and Self-esteem of Science students in relation to their Learning Styles'. The finding of study showed that the Brain based instructional strategy has been found to be a useful tool for enhancing the performance of the students in science subject. The researcher found the students motivated and persistent in their learning process, the threat free environment of BBL plays a vital role. It is an effective teaching strategy that is found to be helpful in enhancing the level of self esteem of learners with different learning styles.

**Burkett, (2014)** Brain-based learning: A study on how teachers implement strategies in the traditional classroom. This study was conducted to ascertain how first through fifth grade teachers implement brain-based learning strategies in the traditional classroom. The

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participants in this study consisted of 10 teachers in first through fifth grades who teach in a school district in western Georgia. Each teacher was trained in brain-based learning through system provided professional development. The findings of this basic qualitative study revealed a variety of brain-based learning strategies utilized by educators to include a positive learning environment and instructional strategies.

**Francis, (2014)** carried out a research study entitled Effectiveness of BBL strategy on Emotional regulation and Critical thinking of Higher Secondary School students. The study revealed that Brain Based Learning Strategy is superior to existing method in teaching in the Emotional Regulation and Critical Thinking of Higher Secondary school students.

### **Conclusion**

The review emphasizes that the brain based learning focuses on concepts that create an opportunity to maximize attainment and retention of information. The review presented herein reveals following conclusions, (i) brain based learning is one of the most effective learning strategies that facilitates significant improvement in students performance and overall development, (ii) most of the research activities in this field have been carried out in foreign countries and the studies carried out in this field in Indian context are sparse. Thus, it signifies the need of more and rigorous research studies to be carried out in India.

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