

# **A CONCEPTUAL RESEARCH STUDY ON IMPACT OF TRADITIONAL V/S BRAIN BASED LEARNING APPROACH ON KNOWLEDGE, CLINICAL PERFORMANCE, MOTIVATION AND SELF-ESTEEM**

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## ***ABSTRACT***

*Brain Based learning is an emerging field in the teaching learning process. It has been studied by many people at large. It has various aspects which are covered taking into mind the learner's brain into consideration rather than just thinking them as the students sitting physically in the class. This aspect of teaching learning tackles with creating the positive attitude towards learning among the students. As a teacher we understand the mentality of the students in bringing this change of creating affinity towards learning process. We as teachers play a major role in attracting the students towards this process.*

***Key Words: Brain Based Learning, Clinical Performance, Motivation***

## **INTRODUCTION:**

Being in teaching profession, we can't be stagnant in our knowledge and the skills. It's mandatory that we keep on updating ourselves continuously so that we are smart enough to deal with smart students. The generation of students is changing day by day where we will have to deal with generation Z students.

We follow Traditional teaching methods since ages. It has been the backbone of the teaching field. With the advancement in the teaching field and various methods used for teaching learning we can be the change agents in the teaching.

When we think of student's mind into consideration, we have to understand their basic needs which are supposed to be met during the teaching learning process. We need to examine the effect of Brain Based learning towards the changes which are desirable in the students. Their attention span, their motivation level, changes in the self-esteem may be affected.

Studying the various studies done by the researchers will help to focus on the effect of Brain Based Learning on the students overall development.

## **REVIEW OF LITERATURE**

### **STUDIES RELATED TO CHANGE IN ACADEMIC ACHEIVEMNT USING BRAIN BASED LEARNING AND TRADITIONAL TEACHING:**

(Tüfekçi & Demirel, 2009) conducted a study titled the effect of Brain Based Learning on Achievement, Retention, Attitude and Learning Process. Two group pretest posttest Mixed method design was used in this study. The learning process was analyzed using qualitative data analysis by conducting an interview. The study samples consisted of third year students at Gazi University, from the department of Educational Science. The students were selected as samples based on their equivalence score acquired in the "Student Selection Examination". The achievement score was collected using an open ended test and attitude was checked using a developed achievement scale (35 statements = 17 negative and 18 positive), also Semi structured interview forms were used for qualitative data collection. The data collection continued for 14 weeks. The control group was taught the topics using Traditional Teaching method whereas the study group was taught using Brain Based Learning method. Results showed that as per the Analysis of Variance of the Post Test Basic Level Learning, there was no significant difference in the post test scores of the study and the control group at 0.05 level of significance for  $F(1,77) = 0.35$ . With regard to the Basic level Total Retention Score Averages, there was a significant difference between retention scores for  $(t = 1.96, p > 0.05)$ . In order to determine the change in the post test attitude scores of the study and control group, the data was analyzed using Result of Covariance ( $F(1,77) = 7.08, p < 0.01$ ). This showed that there was change in the attitude of the students of the study group in which Brain Based Learning was used.

A quasi experimental study was conducted by (Saleh & Subramaniam, 2019) Effects of Brain Based Teaching Method on Physics Achievement among ordinary School students. Purposive Cluster Sampling was used to select 90 students from two schools from Malaysia. A pretest using Physics Achievement test was given to study and control group. Study group was taught using Brain based teaching method and control group was taught using conventional method the topic of Forces and Motion for 6 weeks following Pretest. Post PAT with 20 multiple choice questions was administered. The  $F(1,88) = 9.98$   $p < 0.05$  showed that significant difference was noted in the Post PAT scores within the study and control group, indicating that the Brain Based Teaching method significantly better than the conventional method. The study also analyzed among the results of the male and female students which showed that there was no significant difference in the Standard deviation at 0.05 level of significance and both male and female students achieving similar scores in the PAT scores in the post test.

In order to study the effect of Brain Based learning methods on students Maths achievement at elementary school (Noureen et al., 2017) conducted, a study using pretest posttest control group design was done. All 175 students in 3 divisions of VII the standard students were given the pretest. Students were graded as above average, average and below average as per the pretest scores. Randomly 20 students from each group were selected as the samples. Total 60 students were then randomly divided into 2 groups of 30 each comprising of study and control group. The tool was prepared using “California Standardized Test for Mathematics”. Data was collected through pretest and posttest and also through weekly assessment scores. Students in the study group were taught using 6 principles of BBL and students in the control group were taught using conventional method. The findings of the study showed that there was no significant difference in the pretest scores of both the groups ( $t = 0.198$ ,  $p = 0.843$ ), there was significant difference in the post test scores of the groups ( $t = 7.701$ ,  $p = 0.000$ ). The study results also focused that the students who were in the group of above average achievers in the pretest had a better benefit of the intervention of Brain Based Learning strategy over the conventional method.

(Erol & Batdal Karaduman, 2018) investigated the Effect of Activities Congruent with Brain Based Learning Model on students Mathematical Achievement on 91 fourth grade primary school students using two group pretest posttest and permanence test quasi experimental design. BTOYHMEA and BBLMMEA were used for preparing the activities. Data was collected using

Personal Information Form and Mathematics Achievement Test for Fourth Grade Natural Numbers with 22 items was developed by the researcher. After the pretest and teaching of the content, six weeks later posttest was conducted. The findings showed that there was no significant difference in the pretest scores of both the groups ( $t = -1.549$ ,  $p > 0.05$ ). The Retention Test measures of Mathematics Achievement scores showed statistically significant difference in the study and control group, ( $t = 5.674$ , at  $p < 0.05$ ). This proves that the students who were taught with Brain based learning strategies showed higher mathematical achievement.

(Duman, 2006) investigated the effect of Brain Based Instruction to improve students' academic achievement in social studies instructions. Two group pretest posttest design was used on 6<sup>th</sup> grade 120 primary school students who were randomly assigned into study and control group having 40 in each. 40 students were in control group and 40 in study group 1 and rest 40 in study group 2. Mixed method approach was used as data was collected using Academic Achievement test for Social Studies and Interview Method of Qualitative Research. The study group was taught using Brain Based instructions and control group using traditional teaching methodology. The Study and the control group Pretest results showed no significant difference in academic achievement ( $F = 732$ ,  $p > 0.01$ ). The results of the posttest were calculated using F test, which showed that, there was significant difference in the Class A (control group) and class B and C (study group) which were taught using Brain Based Instructions. ( $F_{2, 110} = 18.57$ ,  $p = 0.000$ ). Scheffe test results showed that there was significant difference in the academic achievement scores of the study and control group, wherein study group showing better achievement.

(Ozden & Gultekin, 2008), conducted a study titled the effects of Brain Based Learning on Academic Achievement and Retention of Knowledge in Science Course of 5<sup>th</sup> grade students. 22 students from 5A and 5B each comprised of the study and control group sample which lasted for 11 days completing 18 hours class. The study groups were taught using Brain based learning strategy and control using Traditional teaching method. Two group pretest posttest experimental design was used. Random sampling was done by drawing lots. A pre study personal Information survey and pretest was administered to the students for equalization of achievement the samples. The result of the pretest having 40 MCQ's showed no significant difference in the achievement level in the Movement and Power Unit. The post test was administered using achievement posttest on the subject of Movement and Power, three weeks later again the posttest was

administered to test the retention capacity of the students in both the groups. The findings showed that there was no significant difference in the achievement level of the Pretest in both the groups with  $t = 2.021$ , at 0.05 level of significance. The posttest results of the  $t$  value showed that  $t = 2.65$  at 0.05 level of significance which was greater than the table value and therefore the findings suggest that the Brain based learning model is more effective than the traditional teaching in science course. The retention test which was taken after a period of 3 weeks also showed a significant difference at  $t = 3.25$  at 0.05 level of significance.

A study was conducted by (Duman, 2010) in 2010 titled, Effects of Brain Based Learning on the Academic Achievements of students with different Learning styles. The academic achievement of the students with different learning styles was assessed on 68 students using two group pretest posttest design. Data collection was done with the help of Academic Achievement test and Kolb's Experiential learning style questionnaire (12 items). The study was conducted in the 2006 – 2007 on third year students of Education Faculty of the Mugla University. Personal information form along with the Academic achievement test of 40 items was administered to determine the study and the control group. The findings were analyzed using Mann Whitney U test which showed that the study group which was taught using Brain Based learning strategies had significant difference than the control group which was taught using traditional method. ( $U = 144.500$ ,  $p < 0.001$ ). The Kruksal – Wallis H test was used to find out the posttest score differences of learning styles within the group. This showed that there was no significant difference in the student's achievement with different learning styles.

(Klinek & Indiana, 2009), in the study, Brain Based Learning: Knowledge, Beliefs, and Practices of college of Education Faculty in the Pennsylvania state system of Higher Education. The survey was collected from the college of Education faculty via E mail. The 700 samples from 13 universities were selected using Nonprobability Convenience sampling. The samples were asked to fill in the Brain Based Learning Survey Questionnaire. The survey findings revealed that the participants knew how the brain learns, but they were also interested if they were trained in knowing the same. Some of the faculty was already using Brain based learning while teaching, while others showed willingness to use if they were taught it properly. The results found strong relationship between knowledge and practice and also knowledge and beliefs. Demographics

showed no relationship with the knowledge, practice or belief of using Brain based learning while teaching.

(Miller, 2004) studied the effects of Brain Based Learning with Technological Support, The data collection was done from 6 teachers, administrator and technology coordinators who were using the Brain Based learning strategies in their teaching and learning. The data was collected using interviews, observations, checklists and questionnaires. The various questions were answered mainly through this data collection i.e. what is the nature of the classroom environment which uses technology in brain based learning classrooms? The answer to this question was the environment is active and learner centered. It is computer based. The next question was what is the role of instructor in the classroom? The answer to this was guide and facilitator to the students who are involved in learning process. 3<sup>rd</sup> question was what is the role of the students in the classroom? The students are active learners engaged in the classroom. 4<sup>th</sup> What are the roles of administration related to Brain Based Learning? The answer was to create a climate where teacher is not scared to try something new in helping the students to learn. 5<sup>th</sup> what problems were faced by the teachers: the answer was mainly the technical problems along with that the noisy situation to handle many students and to solve their doubts.

(Adiansha et al., 2017) investigated the effect of Brain Based Learning Model and creative thinking about the ability of Mathematics concept of Elementary students. The study was conducted on 32 students of class 6<sup>th</sup> of Bima district NTB. The samples were divided into students being taught using Brain based learning model and Discussion Learning model used on students with High Creative thinking and Students with Low creative thinking. The sampling technique used was simple random sampling. The test of creative thinking ability was conducted which decided the highest 27% as high creative thinking students and the ones below that were low creative thinking students, therefore it gave  $27\% \times 32 = 8$  samples in each group. As per the analysis of the findings using ANOVA,  $F_{hitung} = 4,93 > F_{tabel} = 4,15$ . Thus  $F_o > F_t$ , this showed a significant difference in the understanding of Mathematics concepts of the students taught with Brain Based Learning Model over Discussion Learning Model. The calculation of significant difference between those having High creative thinking ability and using Brain Based learning model ( $\bar{X} = 87$  and  $s = 5,952$ ) are significantly higher than those given Discussion Learning

Model ( $X = 74,5$  and  $s = 7,690$ ). But in the students who had low creative thinking ability there was no significant difference.

(Maynard, 2016) in his study investigated the Effects of Brain Based Learning Program on Students use and Recognition of Self Advocacy skills conducted by. The data was collected using self-developed instructional program in a private school for 34 children with language based learning differences in the year 2013 – 2014. The samples included of students, teachers and program facilitators from whom pre and post program questionnaire responses were collected. The questionnaire included questions of self-advocacy and self-advocacy strategies and also students' perceptions about themselves as learners. The students who participated in the study were those having language based learning disability. The self-advocacy program was of 6 weeks duration of 6 sessions including each session of 45 min each. Pre and post self-advocacy program questionnaire was given to the student. Each student had a reading teacher who also completed questionnaire about their perception regarding student's ability related to self-advocacy program. It was having 11 items in the questionnaire. The findings of the study were as follows: 100 % students could not give the right definition of self-advocacy prior to the program, this score changed to 61 % giving right information after the program. The degree of consistency for students and teachers perception of the academic strength changed only for 8 students which was not statistically significant using Wilcoxon Match Paired Signed test. Student's data about handling challenges, identification of helpful strategies had no significant changes from pretest score to posttest.

A study conducted by (Kaur, 2013), titled Effectiveness of Brain Based Learning Strategies on Enhancement of Life skills among Primary school students with Internal and External Locus of Control using Experimental two group design was performed. 2X2X2 factorial design was implemented. The findings showed that the group who was taught Life skills using Brain Based learning performed better than the control group who was taught using traditional method. The male and the female students who had internal locus of control performed better in their Life skills as compared to the males and females having external Locus of Control.

The effect of Brain Based Learning on Academic Achievement: A Meta Analytical study was conducted by (Gözüyeşil & Dikci, 2014). The study included the quantitative studies included between 1999 – 2012. A detailed coding form including study identity, study content, and study

data was prepared. Total 345 theses and dissertations and 108 articles were reviewed. Only 31 studies which were experimental with the control group were included. The total number of students in the study group of the study included were 1473 and control group of 1721. Most students were from K 12. The studies were conducted in Turkey – 19, USA – 9, Taiwan, Pakistan and Malaysia one each. The study findings showed that on the basis of effectiveness of Brain based learning by subject matters: the calculated Q statistic value was 2.757 which was smaller than the critical value of 9.488 which showed that the distribution was homogeneous and had no significant difference among various subject matters. Similarly the effectiveness of BBL by Education level, by sampling size had no significant difference, whereas the effectiveness of BBL by the country showed a significant difference where the studies were carried out. Overall majority of the studies showed a positive effect of Brain based learning strategies over the traditional method.

## **STUDIES RELATED TO BRAIN BASED LEARNING AND ACHIEVEMENT**

### **MOTIVATION:**

(Mekarina & Ningsih, 2017), studied the effects of Brain Based Learning Approach on Motivation and students achievement in Mathematics Learning. The study was carried on 25 students of Grade XI of senior high school. Data was collected using student achievement test and questionnaire which was used to assess the motivation. The students were taught multiplication, permutations and combinations in problem solving. As per the analysis the first cycle learning was in (enough category) and in second cycle it increased to (good category). The increase in learning was 15.74% from first cycle to second cycle. With response to motivation of the students with regard to Brain Based Learning strategy it showed that the students had positive motivation towards using Brain Based Learning while learning the mathematics subject.

(AKYÜREK & AFACAN, 2013), investigated the Effects of Brain-Based Learning Approach on Students' Motivation and Attitudes Levels in Science Class (2013). The study was conducted on 8<sup>th</sup> grade science students using the pre post control group design. The study has one experimental and two control groups. 57 students were equally divided into 3 groups of 19 each. The topic taught in this study was “Cell Division and Heredity”. The data was collected using attitude and motivation questionnaire. Attitude scale was of 20 items and Motivation toward Science Learning had 33 items. The findings of the study showed that the student's attitude

towards learning science using Current Curriculum Methods was very low compared to those taught using Brain Based learning strategy. Similarly the motivation score of the study group in the post test showed a significant difference than the control group stating that the Brain Based Learning strategy is helpful in improving the motivation of the students.

An Article by Heilman S. states that, our Brain depends on the biological and chemical force which has control over our brain. According to (Jensen 2005) teen agers secrete less melatonin during this age and therefore are sleepy. In order to keep them active teachers play a very important role. Brain and jungle are considered to be having similar functions as jungle is involved with low-lying plants, shrubs, forest, similarly brain organizes various functions like thinking, sexuality, memory, emotions, breathing and creativity. Brain Based Learning Strategies help us to learn how our brain is impacted by circumstances and experiences. How should teacher organize the classroom in order to enhance learning? How teachers can use Brain Based learning strategies to improve learning.

#### **STUDIES RELATED TO BRAIN BASED LEARNING AND SELF ESTEEM:**

Sharma L (2018) researched on the Effect of brain based instructional strategies on achievement and self-esteem in relation to perception of classroom environment among elementary school science students. Nonequivalent pretest new line and posttest control group design was implemented. The sample size was 76 students of class VII. The study was carried out for 3 months where the students in control group were taught using conventional method and the students in study group were taught using Brain Based Instructional Strategies. The data collection was done using Rosenberg Self Esteem scale and Achievement Test in Science. The findings of the study show that, the results related to Achievement in Science showed a significant difference in the achievement of experimental and control group, thus proving that the Brain Based Learning was effective in increasing the achievement scores. According the self Esteem scale score, the mean of the experimental group was found to be more by 5.7% than control group thus indicating that the Brain Based Learning strategy helped the students from the experimental group in improving their self-esteem.

Chavan R., (2012) studied the Development of an intervention Programme on brain based learning strategies. Mixed method design, explanatory sequential design, pretest posttest equivalent group design was used. The sampling technique for school selection was incidental sampling technique, Class selection was done randomly. 72 Students from standard VI were selected using Cluster Sampling Technique for 1<sup>st</sup> stage of the study. Second stage 13 students were selected by purposive sampling technique depending upon their achievement level. The tools used were Achievement test, Self Esteem scale, Stress scale, attitude scale, Evaluation Rubric, Interview schedule, worksheets, and Reflection sheets. The findings of the study showed that there was a significant difference in the achievement of the experimental and the control group for pretest and posttest scores, indicating that the Brain Based learning strategy has helped the experimental group to achieve better than the control group. With regard to the self-esteem the  $t = 3.99$ , which is greater than the table value 2.35 at 0.01 level of significance, indicating that the brain based learning intervention has helped the students to improve their self-esteem than the control group students.

### **OBJECTIVES OF STUDY**

This study aims to highlights the benefits of using brain based learning in teaching learning process. And benefits of this study are, BBL and Improvement in knowledge, BBL and Change in self-esteem and BBL and improvement in achievement and motivation.

### **FURTHER AREA OF STUDY IDENTIFIED**

Thus the investigator made the following sub headings in order to divide the literature review.

1. Studies related to change in Academic Achievement using Brain Based Learning and Traditional teaching.
2. Studies related to Brain Based Learning and change in Achievement and Motivation
3. Studies related to Brain Based Learning and change in Self Esteem.

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