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Effect of Brain Based Instructional Strategies on Perception of Classroom Environment of Elementary School Students

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ABSTRACT

Brain based instructional strategies is an educational approach based on the assumption that brain naturally learns best (Slavkin, 2004). Brain based education offers a biologically driven classroom structure that corresponds to the functions of the human brain at different developmental levels. The present study was done to study the effect of brain based instructional strategies on the perception of classroom environment of elementary school students. The study was experimental in nature with one group pre-test post-test experimental design. The sample consisted of 36 students of class VII. Modules based on Brain Based Instructional Strategies were developed by investigator and Classroom Environment Scale by Kaur and Sharma (2013) was used for data collection. The scores obtained in pre-test and post-test on perception of classroom environment were analysed by using paired sample t-test. The findings of the study revealed that there was statistically significant improvement in the perception of the classroom environment of the students taught through brain based instructional strategies.

1. Introduction

Brain Based Learning is the learning in accordance with the way the brain is naturally designed to learn. Brain based learning works across the discipline of Psychology, Pedagogy and Neuroscience. It take discoveries in the brain sciences and apply them to educational policy and teaching approaches. The aim is not only to provide educators with a scientific basis for understanding some of the best practices in teaching but also to offer new ways of looking at problems teachers grapple with every day.

It is a multidisciplinary approach built on the fundamental question – what is good for the brain (Jensen, 2000)? It is an educational approach based on the assumption that brain naturally learns best (Slavkin, 2004).

Brain based learning is based on the knowledge of the structure and functions of the brain. Brain based learning transforms the learner from passive recipient of information to active participant in the learning process. It involves engagement of the emotions of learners, providing enriched environment, actively processing the information, making information relevant and maximum participation of the learners in an environment with low threat and high challenge. The understanding of brain based learning and incorporation of brain based instructional strategies in teaching makes the classroom environment highly conducive for learning.

Brain Based Instructional Strategies were designed by keeping in mind three fundamental elements of Brain based learning i.e., Relaxed alertness, Orchestrated immersion and Active processing of the experiences by creating optimal emotional climate for learning, optimal opportunities for learning and optimal ways to consolidate learning (Caine, Caine, McClintic, & Klimek, 2005).

Relaxed alertness means the brain is alert but relaxed. It means providing learner with the situation that is comfortable to learn and do not pose any threat or stress, thus keeping the learner alert and relaxed at the same time. This provides low threats but make learner ready to accept challenges. This pose challenge to the teacher not only to create the environment in the classroom which is threat free but also challenging to keep them motivated to learn. When a relaxed accepting environment prevails in the classroom, children use their maximum potential (Chavhan, 2012). Challenges motivate the learner to work towards the accomplishment while retaining the attention and interest of the learner thus making learning more impactful.

Orchestrated immersion deals with the reception of stimulus from all sense organs. It is an established fact that the brain learns maximum when various sense organs are involved in the learning. The more experience learners have through various sense organs leads to the change in the physiology of the brain known as neuroplasticity. Involving learner in various activities of classroom like in planning or performing allows new neural circuits to form and hence making the learning more effective.

Active processing of the experiences relates with how much the knowledge is meaningful and relevant. The search for meaning is innate and human mind learns the things best if that has relevancy in life. The learner should be provided with the experiences which has some purpose and meaning. These experiences may or may not come directly with the students to the classroom which makes their learning more meaningful and relevant to them and thus leaving a lasting memory. Involving experiences of learners help to establish some background and relevance of the knowledge they receive in the subject and expedite future learning (Jensen, 2008, p. 218).

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2. Significance of the Study

The unique quality of the environment largely depends upon scientific ways the learners are treated in the school and classroom (Bhatnagar, 1977). The nature of classroom environment and psycho-social interaction can make a difference in how the students learn and achieve their goals (McRobbie, Roth & Lucus, 1997). Research on the classroom environment has shown that the physical arrangement can affect the behaviour of both students and teachers (Savage, 1999; Stewart & Evans, 1997; Weinstein, 1992), and that a well-structured classroom tends to improve student academic and behavioural outcomes (MacAulay, 1990; Walker, Colvin & Ramsey, 1995; Walker & Walker, 1991). Research studies reveal that the campus where the environment is fascinating for students and they feel ease and enjoyment, there achievement of learners is good (Hijazi & Naqvi, 2006; Lizzio, Wilson & Simons, 2002; Baek& Choi, 2002; Howes, 2000). Hence, classroom environment can be defined as the interaction that takes place in classroom between teacher and learners and among learners. It includes the physical environment and the classroom rules and procedure. Having an environment where learners feel safe, nurtured and intellectually stimulated is must for learners to learn to their potential. This type of positive classroom climate allows students to meet their basic needs of physical and mental health (Falsario, Muyong & Nuevaespana, 2014). Researches also revealed that teaching though brain based instructional strategies have resulted in improved achievement of the learners at various levels (Bilal, 2006; Wilson, 2007; Tufekci & Demirel, 2009; Saleh,2011; Haghighi, 2012; Sharma, 2013; Gozuyesil & Dikicib, 2014). Brain based learning advocates to provide the environment to the learners by creating optimal emotional climate for learning, optimal opportunities for learning and optimal ways to consolidate learning in threat free and challenging environment. Therefore, the present study was done to find out how teaching through brain based instructional strategies effect the perception of the students towards their classroom environment.

3. Objectives

1. To find out the effect of brain based instructional strategies on the perception of classroom environment of elementary school students.
2. To find out the effect of brain based instructional strategies on dimensions of perception of classroom environment of elementary school students.

4. Method

In the present study experimental method of research was used. The design used in the study was one group pre-test post-test experimental design. Only one group was subjected to the experiment. The experimental group had 36 students studying in class VII in a CBSE affiliated school in Chandigarh. The school was randomly selected and permission to conduct the experiment was taken from the school authority. Before execution of the experiment the scale for perception of classroom environment was administered on the students and the scores were taken as the pre test scores.

The experiment group was then taught through the brain based instructional strategies. The experiment continued for three months where students were taught Science through various instructional strategies including cooperative learning, discussion, experiment, field visit, individualized learning, pictures, video, storytelling, memorization, problem based learning etc. Mediation, break for drinking water, choice for seating arrangement, questioning and humour were also a part of classroom interaction with regular feedback. Threat free classroom environment with zero tolerance policy for teasing, humiliation, put downs, etc. was also taken care.

After the execution of experiment the scale for perception of classroom environment was again administered on the students and obtained scores were taken as post test scores.

5. Result

The scores obtained were analysed by using paired sample t-test to find out the statistical difference between the pre-test and post-test scores on perception of classroom environment. The analysis was done at 0.05 level of significance.

Table 1 Showing Results of Paired Sample t-test on Perception of Classroom Environment

Variable	Group	Mean	N	SD	SEM	t-value	p-value	r	Cohen's d
Perception of Classroom Environment	Pre Test	182.83	36	12.415	2.069	4.502*	.000	.577	0.690
	Post Test	191.42	36	12.468	2.078				

The value of correlation (r) between pre-test and post-test was found to be .577 which was statistically significant at .05 level ($p<.05$), establishing the pre-test and post-test measure the same concept.

The paired sample t-test was calculated for pre-test and post-test scores of perception of classroom environment and the t-value was found to be 4.502 significant at the .05 ($p<.05$) level of significance. Hence, it can be concluded that the group taught through brain based instructional strategy had statistically significant increase in perception of classroom environment of elementary school students from less favourable to more favourable. The effect size for this analysis ($d= .69$) was found to exceed Cohen's (1988) convention for a medium effect. The results indicate that implementing the brain based instructional strategies improved the perception of classroom environment.

Further analysis was done to investigate dimensions that had the significant increase due to Brain Based Instructional Strategies. The scores of each dimension were analysed using the paired sample t-test.

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Table 2 Showing Results of Paired Sample t-test on Various Dimension of Perception of Classroom Environment

Dimensions	Group	Mean	N	SD	SEM	t-value	df	p-value	r	Cohen's d
Classroom Infrastructure	Pre Test	35.75	36	2.980	.497	.733	35	.468	.447	.134
	Post Test	36.28	36	4.731	.788					
Leadership vs. Uncertainty	Pre Test	24.47	36	4.130	.688	2.758*	35	.009	.042	.641
	Post Test	26.56	36	2.049	.341					
Helping, Friendly vs. Dissatisfied	Pre Test	12.92	36	1.991	.332	2.423*	35	.021	.454	.430
	Post Test	13.67	36	1.454	.242					
Understanding vs. Admonishing	Pre Test	19.53	36	3.393	.566	4.754*	35	.000	.071	1.09
	Post Test	22.39	36	1.498	.250					
Student Freedom vs. Fear	Pre Test	19.14	36	2.949	.491	4.754*	35	.000	.119	.961
	Post Test	21.72	36	2.386	.398					
Student Behaviour and Characteristics	Pre Test	23.78	36	2.987	.498	1.075	35	.290	.007	.250
	Post Test	24.47	36	2.490	.415					
Discipline and Evaluation	Pre Test	46.56	36	3.768	.628	.484	35	.631	.106	.107
	Post Test	47.03	36	4.896	.816					

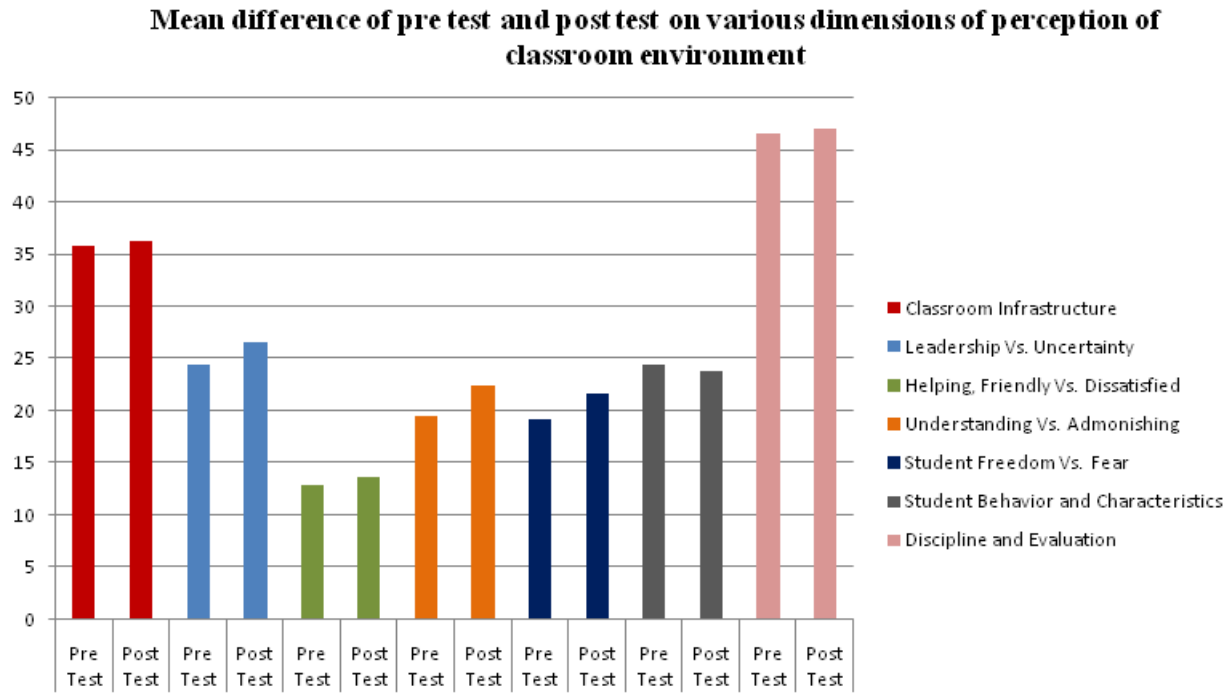

Figure 1 Showing Mean Difference of Pre-test and Post-test on Various Dimensions of Perception of Classroom Environment

The analysis of the scores showed that t-value for dimensions of perception of classroom environment related with classroom infrastructure, student behaviour and characteristics and discipline and evaluation was found to be .733, 1.075 and .848 respectively. An increase in the mean can be observed but the gain was not found to be statistically significant as the calculated t-value were found to be less than the table value at 0.05 level of significance.

The t-value calculated for the dimensions of perception of classroom environment related with teacher behaviour and characteristics including leadership vs. uncertainty; helping, friendly vs. dissatisfied; understanding vs. admonishing and student freedom vs. fear were found to be 2.758, 2.423, 4.754, and 4.754 respectively. The t-value calculated were found to be greater than the table value hence it can be concluded that elementary school students taught Through Brain Based Instructional Strategies had statistically significant improvement in perception of classroom environment from less favourable to more favourable.

The effect size for calculated for the various dimension showed varied effect size. The effect size for Classroom Infrastructure; Helping, Friendly vs. Dissatisfied; Student

Behaviour and Characteristics and Discipline and Evaluation were found to be .134, .430, .250 and .107 respectively which were found to be less than Cohen's (1988) convention for a medium effect. These dimensions had small effect size. The medium effect of the teaching strategy was found on Leadership vs. Uncertainty and the strategy had small effect on Helping, Friendly vs. Dissatisfied; followed by Student Behaviour and Characteristics; Classroom Infrastructure; and Discipline and Evaluation. The effect size for Leadership vs. Uncertainty (d = .64) was found to exceed Cohen's (1988) convention for a medium effect and the dimensions Understanding vs. Admonishing and Student Freedom vs. Fear had effect size 1.09 and .961 respectively, which were found to be greater than Cohen's (1988) convention for a large effect. It can be concluded from the results that teaching through Brain Based Instructional Strategies had major effect on Understanding vs. Admonishing dimension of perception of classroom environment followed by Student Freedom vs. Fear.

The favourable effect of Brain Based Instructional Strategies on students' perception of classroom environment can be attributed to the fact that the principle of brain based learning take into consideration the physical, social and emotional aspect of learning. Researcher provided threat free environment to the students which allowed them to interact freely in the classroom environment where each students abilities and potential were channelized during the execution of instructional strategies. Researches has shown that teachers can positively influence the learning, health and well-being of their students by having positive and optimistic views of their abilities and potential (Cozolino, 2013). The researcher Zull (2011) says that "freedom can be expressed in many ways, and those expressions are part of the freedom. The key is choice – not an infinite range of choices, but choices within an existing knowledge framework" (p.74).The students during the study were provided with positive environment where they can share their opinions and ideas. Lackney (n.d.) advocates that students should be able to take academic chances without the fear of repercussions. The integrated teaching approach and safe environment challenge the students academically in a fear free environment resulting in superior understanding of the educational material (Schnipper, n.d.). This kind of environment is preferable because it reduces fear and provided environment that develop insight among learners.

6. Conclusion

It can be concluded from the results of the present study that:

- There is significant increase in perception of classroom environment of elementary school students from less favourable to more favourable.
- There is significant increase on various dimensions of perception of classroom environment from less favourable to more favourable related with teacher behaviour and characteristics including leadership vs. uncertainty; helping, friendly vs. dissatisfied; understanding vs. admonishing and student freedom vs. fear
- There was no change in the perception of classroom environment on the dimensions related with classroom infrastructure, student behaviour and characteristics and discipline and evaluation.

7. Suggestions

The perceptions of classroom environment of students get effected when taught through Brain Based Instructional Strategies. Students find the classroom environment more conducive for learning when taught through Brain Based Instructional Strategies as in a class utilizing instructional strategies based on brain based learning learners are not just the passive recipient of knowledge but are actively involved in organizing and finding relationship in that knowledge. It not only increase learning and retention of learners but also improve thinking skills (Eggen and Kauchak, 1998). Brain based learning creates friendly and safe emotional and physical environment with simple exercises, freedom to move around, express thoughts in variety of ways along with appropriate feedback and opportunities for cognitive process. Hence, when students are provided with such an enriched environment, learning can be enhanced (Chavhan, 2012), therefore, the brain based instructional strategies should be implemented in classroom teaching learning process.

References

1. Baek, Sun-Guen & Choi, Hye-Jeong. (2002). The relationship between students' perceptions of classroom environment and their academic achievement in Korea. *Asia Pacific Education*, 3 (1), 125-135.
2. Bhatnagar.(1977). In Tripathi, Y. (2008). *Parental participation in children's learning process of Nepalese institutional secondary school of Katmandu district* (Master's thesis). Kathmandu University, Kathmandu, Nepal. Retrieved from http://cef.edu.np/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=4&cntnt01returnid=217
3. Bilal, D. (2006).*The effect of brain-based instruction to improve on students' academic achievement in social studies instruction*. Retrieved from http://www.ineer.org/events/ICCE2006/papers/3380.pdf.
4. Chavhan, R. K. (2012). *Development of an intervention programme on brain based learning strategies* (Doctoral dissertation, S.N.D.T Women's University, Mumbai, India). Available Shodhganga - INFILBNET Centre.
5. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* New York, NY: Routledge Academic.
6. Cozolino, L. J. (2013). *The social neuroscience of education: Optimizing attachment and learning in the classroom*. New York, USA: W.W. Norton & Company.
7. Eggen, P. & Kauchak, D. (1998).*Learning and teaching: Research-based methods (3rd ed).* Boston: Allyn and Bacon.
8. Falsario, H. N., Muyong, R. F., & Nuevaespana, J. S. (2014). *DLSU Research Congress 2014*.De La Salle University, Manila, Philippines. Retrieved from http://www.dlsu.edu.ph/conferences/dlsu_research_congress/2014/_pdf/proceedings/LLI-I-003-FT.pdf
9. Gozuyesil, E., & Dikicib, A. (2014).*The effect of brain based learning on academic achievement: A meta-analytical study*. Retrieved April 26, 2014, from

https://www.edam.com.tr/kuyeb/pdf/en/a6672f156e8f9cbea86b7f9472d23bacrsten.pdf

10. Haghighi, M. (2012). The effect of brain- based learning on Iranian EFL learners' achievement and retention. *Procedia - Social and Behavioral Sciences*, *70*, 508–516. doi:10.1016/j.sbspro.2013.01.088
11. Hijazi, S. T., & Naqvi, S. M. M. R. (2006). Factors affecting students' performance: A case of private colleges. *Bangladesh e-Journal of Sociology*, 3 (1).
12. Howes. (2000). In Rana, R. A., & Akbar, R. A. (2007).*Relationship between classroom learning environment and students' achievement in higher education*. Retrieved from http://www.ibrarian.net/navon/paper/Relationship_between_Classroom_Learning_Environme.pdf?paperid=8030917
13. Jensen, E. (2000). Rethinking the brain. In *Brain-based learning: The new science of teaching & training* (p. 6). San Diego, CA: The Brain Store.
14. Jensen, E. (2008). Curriculum in brain compatible classroom. In *Brain-based learning: The new paradigm of teaching* (2nd ed., p. 218). Thousand Oaks, CA: Corwin Press.
15. Kaur, S. & Sharma, L. (2013).*Achievement in science in relation to students perception of classroom environment and their emotional intelligence*. (Unpublished doctoral dissertation).Panjab University, Chandigarh, India.
16. Lackney, J. A., (n.d.). *12 Design principles based on brain-based learning research*. Retrieved from http://www.designshare.com/Research/BrainBasedLearning98.htm
17. Lizzio, A., Wilson, K., & Simon, R. (2002). University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education*, 27 (1), 27-52.
18. MacAulay, D. J. (1990). Classroom environment: A literature review. *Educational Psychology*, 10(3), 239-253.
19. McRobbie, C. J., Roth, W. M., & Lucus, K. B. (1997). Multiple learning environments in a physics classroom. *International Journal of Educational Research,* 27, 333-342.
20. Saleh, S. (2011). *The effectiveness of the brain based teaching approach in enhancing scientific understanding of Newtonian physics among form four students.* Retrieved from http://files.eric.ed.gov/fulltext/EJ972447.pdf
21. Savage, T. V. (1999). *Teaching self-control through management and discipline*. Boston: Allyn and Bacon.
22. Schnipper, P. (n.d.). Brain Based Learning is Active Learning. Retrieved from http://www.bbbforlearning.com/uploads/1/0/4/4/10446722/brain_based_learning_is_active_learning.pdf
23. Sharma, P. (2014). *Perception of students about the benefits of co-curricular activities for development of personality*.(Unpublished master's dissertation).Panjab University, Chandigarh, India.
24. Slavkin. (2004). In Chavhan, R. K. (2012). *Development of an intervention programme on brain based learning strategies* (Doctoral dissertation, S.N.D.T Women's University, Mumbai, India). Available Shodhganga - INFILBNET Centre.
25. Stewart, S. C. & Evans, W H. (1997). Setting the stage for success: Assessing the instrumental environment. *Preventing School Failure,* 41(2), 53-56
26. Tüfekçi, S., & Demirel, M. (2009). The effect of brain based learning on achievement, retention, attitude and learning process. *Procedia - Social and Behavioral Sciences*, *1*(1), 1782–1791. doi:10.1016/j.sbspro.2009.01.316
27. Walker, H. M., & Walker, J. E. (1991). *Coping with noncompliance in the classroom: A positive approach for teachers.* Austin, TX: Pro-Ed. Retrieved from http://education.odu.edu/esse/research/series/expectations.shtml
28. Walker, H. M., Colvin, G., & Ramsey, E. (1995). *Antisocial behavior in school: Strategies and best practices*. Pacific Grove, CA: Brooks/Cole. Retrieved from http://education.odu.edu/esse/research/series/expectations.shtml
29. Weinstein, C. S. (1992). *Designing the instructional environment: Focus on seating*. Bloomington, IN: Proceedings of Selected Research and Development Presentations at the Convention of the Association for Educational Communications and Technology. (ERIC Document Reproduction Service No. ED348039).
30. Wilson, K. T. (2007). *Music and arts education: It's effect on brain development and academic achievement.* Retrieved from http://classroom.jc-schools.net/wilsont/Litreviewfinaldraft.pdf
31. Zull, J. E. (2011). *From brain to mind: Using neuroscience to guide change in education*. Sterling, VA: Stylus Pub.

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