

EFFECT OF BRAIN TRAIN GAMES: ACQUISITION OF THE ATTENTION AND VISUOSPATIALSKILLS OF SLOW LEARNERS

LOURDU MARY.A¹, Dr. G. REXLIN JOSE²

¹Research Scholar, Department of Education, ManonmaniamSundaranar University, Tirunelveli, Tamilnadu, India

²Assistant Professor, Department of Education (DD&CE), ManonmaniamSundaranar University, Tirunelveli, Tamilnadu, India

ABSTRACT

The Investigator projected the main Objective of this experimental research as the effect of Brain Train Games on acquisition of the Attention and Visuospatial Skills of Slow Learners. This study was carried out with regard to the level of Intelligence, the intelligence test developed by JC Raven and medical examination were administered among 24 Slow Learners studying standard 9th. The Research design consists of three phases namely selection of sample, Brain Train Gamesvalidation and construction of achievement test, Experimentation. The investigator has employed pre-test – post-test Single Group design. The experimenter introduced the treatment with the Brain Train Games.Data were analysed using descriptive statistics and t-test. The results revealed that the average achievement scores after receiving the treatment on Brain Train Gameswere statistically and significantly high.The mean score of post-test (72.21) is greater than the mean score of the pre-test (42.92) of the Attention Skill. The mean score of post-test (65.46) is greater than the mean score of the pre-test (48.58) of the Visuospatial Skill of the Upper Primary Slow Learners. The Retention test also revealed that this experiment has brought desirable changes among Slow Learners. The School Administrators and teachers can use this treatment as guidance to develop cognitive skills of the slow learners.

Keywords:Slow learners, Individual Differences, Brain Train Games, Cognitive skills,Attention Skill and Visuospatial Skill

INTRODUCTION

Educational system puts a lot of efforts to keep traditions and conservative elements of the educational process. Progress makes it a necessity to implement new technological advancements available on the market to enhance learning process and take the most out of innovative educational solutions. This contrast and cooperation of modern technologies and traditional education can be evidenced even in the architecture of

universities. Innovations are to be implemented in the system to enhance the learning outcome of the Slow learners.

A best quality education is one that provides all learners with capabilities they require to become economically productive, develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual well-being. Teachers are key to improving learning. They have a powerful impact on the

quality of student learning. Quality learning is not only essential for meeting people's basic needs, but is also fundamental in fostering the conditions for global peace and sustainable development. The mental process by which the external environmental stimuli that arouse the senses of the individual and attract the attention, and enable to adapt psychologically and socially.

INDIVIDUAL DIFFERENCES

Heredity and environment have their own important place in an individual's development. In a way, both heredity and environment are interdependent so far as an individual's development is concerned and neglecting any of the two will be fatal to his development. Due to these two operating factors individual differences are found in physical as well as mental aspects of the students. In addition to general intelligence, we discuss three other major aspects of behavior in which individuals differ: speed of processing, working memory, and the learning of three-term contingencies Williams,(2008).The main focus is on the individual differences encountered in the intellectual development of students and also how to accommodate instruction to these individual differences. Even if all students begin class at the same level, some are likely to learn more easily and rapidly than others. Some students will learn more rapidly than their class mates. The problem that plagues every teacher in every subject at every grade level is how to teach one lesson to a class that contains students with different skills and learning rates. But they also differ in cognitive abilities and learning rates, which are of great concern to educators.

SLOW LEARNERS

Due to their unique characteristics of slow learners (Chauhan, 2011), their education must be altered and geared to their slower pace of learning (Borah, 2013; Lohman, 2011; Placement, 2010; Krishnakumar et al., 2006). Denying their disabilities and pretending that they are able to learn as normal students will be detrimental to their development (Idol, 2006). It is suggested that, slow learners need help but the "type of school" is not the answer as neither group of slow learners is "successful" in school (Kaznowski, 2003). Special Education does not positively affect the academic performance of the slow learners, whilst mainstream education is not a realistic option for slow learner either (Kaznowski, 2003), where leaving them failing in the mainstream school is not an acceptable alternative (Kaznowski, 2004).

These issues posed a challenge to provide the best learning environment for slow learners, and it is suggested that the way we cater to their individual needs, despite the type of school, will make the ultimate difference (Holloway, 2001). Mary & Jose(2020) conducted a study on impact of e - blended learning resources on achievement of science of slow learners The Objective of this experimentalresearch was to examine the impact of e- blended Learning Resources on Achievement of slow learners. In every School slow learners are considered as students whose ability to deal with abstract and symbolic materials i.e Language, number and concepts is very limited. AVasudevan (2017) conducted a study on Slow learners – causes, problems and educational programmes. The child we call a slow learner is not in need of special education. He is likely to need some extra time and help in regular class room. He is capable by learning like an average child.

A slow learner is one who learner at a slower than average rate. The causes of slow learning are low intellectual learning and personal factors such as illness and absence from school. The environmental factors also contribute to this slow learning. Lama Bendak (2018) conducted a study on Effects of Applying Repeated Readings Method on Reading Fluency and Passage Comprehension of Slow Learners. In this study twenty slow learners. Whose ages ranged from 5.5 to 8.5 years and who are studying in grades 1,2 and 3, were recruited from two private schools in Lebanon. Those students were divided equally into two groups, a control and an experimental group. The measuring instrument used in this study was the Woodcock-Johnson III Test of Achievement reading fluency and passage comprehension sections.

COGNITIVE SKILLS

Cognitive skills, also called cognitive functions, cognitive abilities or cognitive capacities, are brain-based skills which are needed in acquisition of knowledge, manipulation of information, and reasoning. They have more to do with the mechanisms of how people learn, remember, problem-solve, and pay attention, rather than with actual knowledge. Cognitive skills or functions encompass the domains of perception, attention, memory, learning, decision making, and language abilities (Kim, 2014). Cognitive development is how a person perceives, thinks, and gains understanding of their world through the relations of genetic and learning factors. Cognitive psychology is the scientific study of mental processes such as attention, language use, memory, perception, problem solving, creativity, and reasoning. Cognitive abilities are associated with

academic performance. Executive function measured in preschool predicts performance on math and literacy in kindergarten (Blair & Razza, 2007)

ATTENTION SKILL

Attention is a highly flexible mechanism that can operate on regions of space, particular features of an object, or entire objects. It also be directed either overtly or covertly. The selection is assumed to occur while the eyes are stationary (covert attention) and is separate from the visual selection that is performed by directing gaze to a particular location. Attention can be divided into two major attentional systems: exogenous control and endogenous control. Exogenous control works in a bottom-up manner and is responsible for orienting reflex, and pop-out effects. Endogenous control works top-down and is the more deliberate attentional system, responsible for divided attention and conscious processing. (Chica, 2013)

It's also the ability to sustain or focus on visual information for periods of time and shift focus when necessary. Visual processing is the ability to take in and understand information. A key function of attention is to identify irrelevant data and filter it out, enabling significant data to be distributed to the other mental processes. The human brain may simultaneously receive auditory, visual, olfactory, taste, and tactile information. The brain is able to consciously handle only a small subset of this information and this is accomplished through the attentional processes. Anderson, J.R. (2010).

VISUOSPATIAL SKILL

Visuospatial ability is a component of visual perception that enables processing of the visual orientation or location of objects in space. The

visuospatial is functionally and neuro anatomically distinct from the visuo perceptual system. The visuoperceptual system gets input from retinal ganglion cells which project to the ventral layers of the lateral geniculate nucleus followed by superior occipital and parietal projections. Impairments in visuospatial abilities can result in deficits in visuospatial judgment, visual neglect, topographic disorientation, and Balint's syndrome (Capruso, Hamsher, & Benton, 2006). Visuospatial ability refers to the capacity to identify visual and spatial relationships among objects.

Visuospatial ability is measured in terms of the ability to imagine objects, to make global shapes by locating small components, or to understand the differences and similarities between objects. Visuospatial function refers to cognitive processes necessary to identify, integrate, and analyze space and visual form, details, structure and spatial relations in more than one dimension. Visuospatial skills are needed for movement, depth and distance perception, and spatial navigation. Visuospatial processing refers to the ability to perceive, analyze, synthesize, manipulate and transform visual patterns and images. Visuospatial working memory is involved in recalling and manipulating images to remain oriented in space and keep track of the location of moving objects.

BRAIN TRAIN GAMES

Brain-training games are digital games intended to exercise and improve specific aspects of cognitive function and behaviour. The prospect of cognitive enhancement has a long history with the young seeking to boost performance and the old to stave off mental decline through pharmacological products. Train with games for

specific cognitive skills. Brain games help evaluate and train the mind, the brain, and the cognitive abilities. Taking advantage of the latest research on neuroplasticity, CogniFit has developed specific brain workouts for the various cognitive skills.

To Improve the cognitive abilities every day play every day and challenge the mind with just 10 minutes a day, To keep the brain in shape in areas such as Memory, Attention, Co-ordination, Cognitive flexibility and to train as needed in addition, the training adapts automatically according to the level in a personalized way. Cognition and Cognitive Science will stimulate the brain. Brain training activities are good for *everyone* because they build neuron connections. Visual (Al-Meligy, 2004). That is, the child's ability to pay attention to the shape, and at the same time exclude all stimuli present in his background that do not belong to it (Lee, 2003) All young people need to learn in active, collaborative and self-directed ways in order to flourish and contribute to their communities.

REVIEW OF RELATED LITERATURE

Adamson (2019) This study provides an expanded view of joint attention and its relation to expressive language development. A total of 144 toddlers (40 typically developing; 58 with autism spectrum disorder, ASD; 46 with developmental delay, DD) participated at 24 and 31 months. Toddlers who screened positive for ASD risk, especially those subsequently diagnosed with ASD, had poorer joint attention skills, joint engagement during parent-toddler interaction, and expressive language. Findings highlight the dynamic relation between joint attention and language development. In the ASD and DD groups, joint engagement

predicted later expressive vocabulary, significantly more than predictions based on joint attention skills. Joint engagement was most severely impacted when toddlers did not talk initially and improved markedly if they subsequently began to speak.

Gabriele (2013) Over the past 15 years, research on focus of attention has consistently demonstrated that an external focus (i.e., on the movement effect) enhances motor performance and learning relative to an internal focus (i.e., on body movements). This article provides a comprehensive review of the extant literature. Findings show that the performance and learning advantages through instructions or feedback inducing an external focus extend across different types of tasks, skill levels, and age groups. Benefits are seen in movement effectiveness (e.g., accuracy, consistency, balance) as well as efficiency (e.g., muscular activity, force production, cardiovascular responses). Methodological issues that have arisen in the literature are discussed. Finally, our current understanding of the underlying mechanisms of the attentional focus effect is outlined, and directions for future research are suggested.

Marjorie et al., (2011) This study explored the attentional focus of expert golfers using a naturalistic approach. Eight male professional golfers were filmed in two contexts (training and competition). Self-confrontation interviews based on the video were conducted immediately afterwards. Qualitative data analyses showed that golfers used various attentional foci. Foci were classified according to their content and their characteristics. Golfers adapted their attentional foci to the context. They used sequences of attentional foci and moved from one attentional focus to another when they

prepared, executed, or evaluated their shot. Future research on attentional focus of expert athletes should study the phenomenon over time.

Zwierko et al., (2010) Volleyball is a dynamic game which requires a high level of visual skills. The first aim of this study was to investigate the several aspects of reaction times (RT) to visual stimuli in volleyball players (12) compared to non-athletic subjects (12). By using the tests included in the Vienna Test System (Schuhfried, Austria), simple reaction time (SRT), choice reaction time (CRT) and peripheral reaction time (PRT) were examined. The second aim of this study was to assess the neurophysiological basis of early visual sensory processing in both examined groups. We measured two sets of pattern-reversal visual evoked potentials (VEPs) during monocular central field stimulation (Reti Scan, Roland Consult, Germany). The latencies of waves N75, P100 and N135 were determined. We observed significantly shorter.

OBJECTIVES OF THE STUDY

Pre Test – Post Test Analysis

1. To find out the significant difference between the pre-test and post-test scores of the Attention Skill of the Upper Primary Slow Learners.
2. To find out the significant difference between the pre-test and post-test scores of the Visuospatial Skill of the Upper Primary Slow Learners.

Retention test analysis

1. To find out the significant difference between the post test and retention test scores of the Attention Skill of the Upper Primary Slow Learners who

- underwent treatment through computer assisted Brain Train Games.
2. To find out the significant difference between the post test and retentiontest
 - 3.

scores of the Visuospatial Skill of the Upper Primary Slow Learnerswho underwent treatment through computer assisted Brain Train Games.

METHODOLOGY

Research design

TYPE	SOURCE	
Variables	Dependent Variable Attention&Visuospatial Skills	In Dependent Variable Brain Train Games
Tools used	a) JC Raven Achievement Test b) Self-made Tool	
Sample	24 Slow Learners of standard IX of St.Anne's Matric. Hr.Sec.School, Kumbakonam.	
Validity	The Brain Train Gameswere verified by experts. The correction was done as suggested by them.	
Treatment	Brain Train Games	
Durations of the experiment	30 days (2 hours a day)	
Descriptive Analysis	t-test	

Tool Description

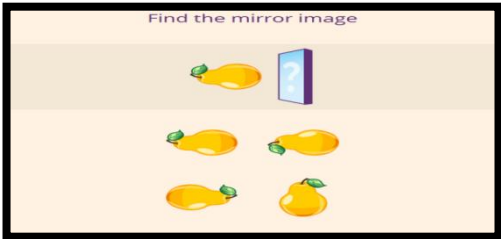
The investigator administered the Self –Made Tool which consist of 4 Phases.

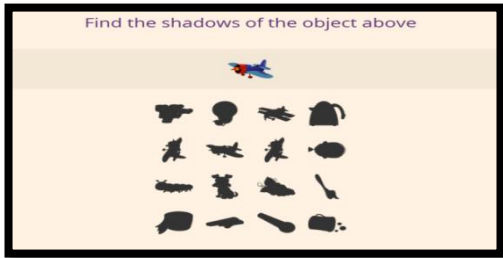
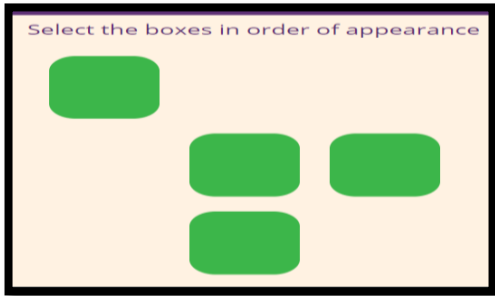
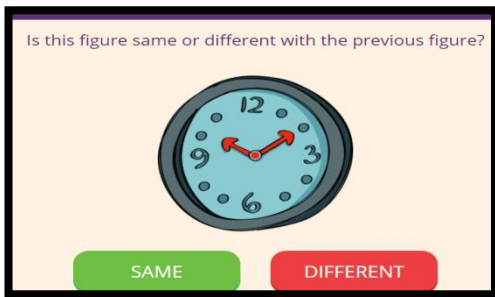
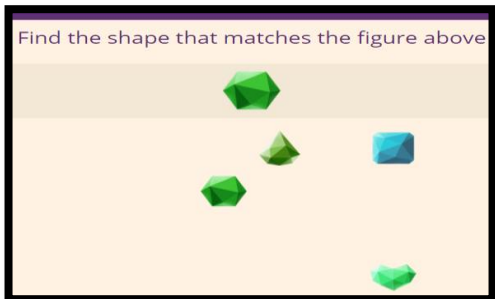
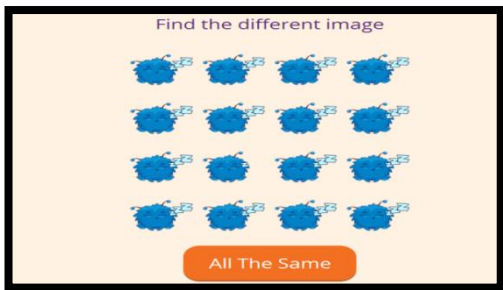
Phase I: Selection of Games

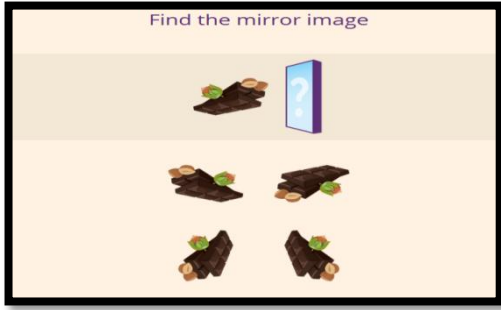
The investigator selected for each skill 10 games to improve Attention andVisuospatial skillsof Slow Learners.

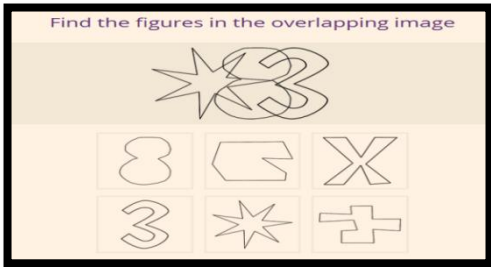
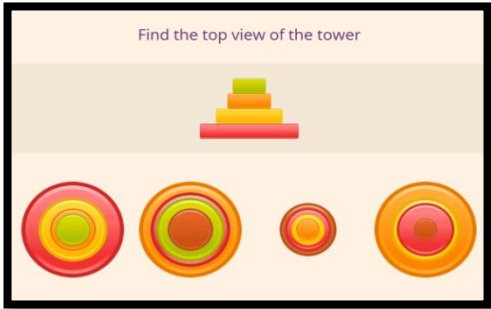
Phase II: Dividing the Games

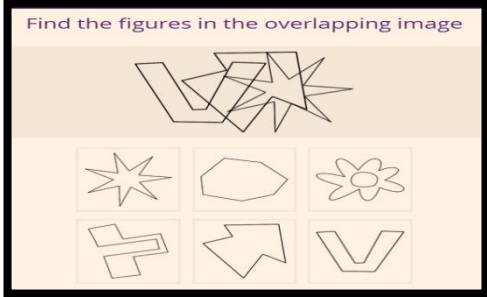
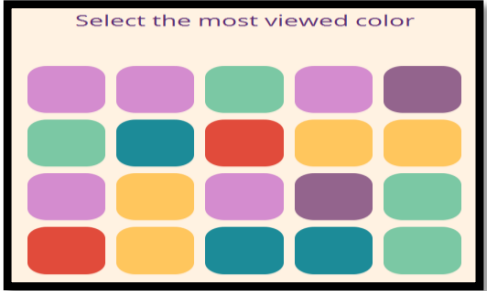
The investigator divided the Games and Scoring key was made to evaluate their performance as follows

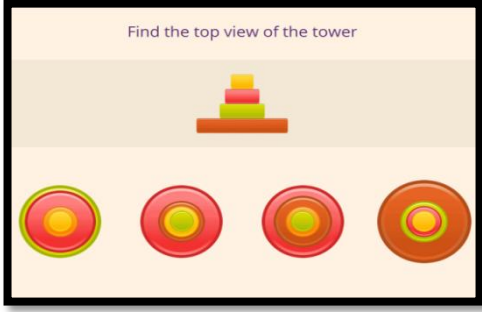
BRAIN TRAIN GAMES ATTENTION SKILL				
Sl. No	Name of the Activity	Image of The Game	Description	Outcome
1	Find the different image		Sixteen hats are given in an order. Students are asked to find out the odd one within 25 seconds.	Visual Attention, Visual scanning, Comparison
2	Find the mirror image		The students are asked to find out the mirror image of the mango among four given mangoes within 25 seconds.	Visualization, Visual Attention, Comparison
3	Find the pairs		Students are asked to find out the pair of the given numbers within 25 seconds.	Visual Attention, Visual scanning, Comparison
4	How many birds do you see?		Students are asked to find out the number of birds in the given picture within 25 seconds.	Visual attention, counting skills.

5	Find the shadows of the object.		Students are asked to find out the shadow of the given images among the 16 shadows within 25 seconds.	Visual Attention, Visual Scanning, Reasoning
6	Follow the boxes		Students are asked to observe the images displayed on the screen as it disappears find out the exact image among other images that appears on the screen within 25 seconds.	Sustained Attention, Visual Tracking, Spatial Memory
7	Remember the figure		Students are asked to observe the images displayed on the screen as it disappears find out the exact image among other images that appears on the screen within 25 seconds.	Sustained Attention, Visual Recognition, Short-Term Memory
8	Find the shape that matches the figure above		Students are asked to find out the exact other image within 25 seconds.	Visual Attention, Visual Scanning, Comparison
9	Find the different image		Sixteen toys are given in an order. Students are asked to find out the odd one within 25 seconds.	Visual Attention, Visual Scanning, Comparison

10	find the mirror image		The students are asked to find out the mirror image of the candy among four given candies within 25 seconds.	Visualization, Visual Attention, Comparison
----	-----------------------	---	--	---

BRAIN TRAIN GAMES VISUOSPATIAL SKILL				
Sl. No	Name of the Activity	Image of The Activity	Description	Outcome
1	Find the figures in the overlapping image		Students are asked to find out the overlapping images within 25 seconds.	Visualization, Visual Attention, Reasoning
2	Find the top view of the tower		Students are asked to find out the colours that match with the colour of the tower within 25 seconds.	Visualization, Visual Attention, Spatial Perception

3	Find the figures in the overlapping image		Students are asked to find out the overlapping images within 25 seconds.	Visualization, Visual Attention, Reasoning
4	Rotate the pieces and find the correct image		Students are asked to find the correct image by the rotating the pieces within 25 seconds. The mark allotment is given based on the seconds they take to find.	Visualization, Visual Attention, Reaction Control
5	Select the most viewed colour		Students are asked to find out the most viewed colour among the twenty colours within 25seconds.	Visual Attention, Counting skills
6	Find out which hand it is		Students are asked to find out which hand is shown in the image(left hand or right hand)within 25 seconds.	Visualization, Visual Attention, Reasoning

7	Find the top view of the tower		Students are asked to find out the colours that match with the colour of the tower within 25 seconds.	Visualization, Visual Attention, Spatial Perception
8	Find the missing pieces		Students are asked to find out the missing pieces from the given image within 25 seconds.	Visualization, Visual Attention, Reasoning
9	Find out which hand it is		Students are asked to find out which hand is shown in the image(left hand or right hand)within 25 seconds.	Visualization, Visual Attention, Reasoning
10	Find the missing pieces		Students are asked to find out the missing pieces from the given image within 25 seconds.	Visualization, Visual Attention, Reasoning

Scoring Key

The mark allotment is given based on the seconds they take to complete the game. Right response within 5 seconds is awarded 5 marks, within 10 seconds is awarded 4 marks, within 15 seconds is awarded 3 marks, within 20 seconds is awarded 2 marks, within 25 seconds is awarded 1 mark. Time bar out is zero. The detailed description of Scoring key is given below.

SECONDS	MARKS
0 - 5	5
6 - 10	4
11 - 15	3
16 - 20	2
21 - 25	1
Time bar out	0

Phase III: Incorporating and integrating multimedia elements.

The investigator integrated & incorporated multimedia elements with Brain Train games and synchronized these exercises with audio track by editing the exercises with the help of numerous editing software. The validity of Brain Train games were verified by experts. The corrections were done as suggested by them

Phase IV: Software Designing

The investigator integrated and synchronized Brain Train Games with audio track by editing the games with the help of numerous editing software.

DATA COLLECTION PROCEDURE

(i) The researcher explained the purpose and details of the research and requested their co-operation

in the research, the intelligence test and medical examination were conducted on the Slow Learners.

(ii) The 24 Slow Learners received the treatment on Brain Train Games for 30 days. The researcher

conducted the treatment session for 60 minutes.

(iii) After 30 days of treatment post-test was conducted.

(iv) The Retention test was conducted after 10 days.

DATA ANALYSIS

The data were analysed as follow.

(i) Descriptive statistics- t-test

(ii) Compare the difference of means scores before and after receiving the treatment with Brain Train Games.

RESULTS

Pre Test – Post Test Analysis

H1: There is significant difference between the pre-test and post-test scores of the Attention Skills of the Upper Primary Slow Learners who underwent treatment through Computer Assisted Brain-Train Games

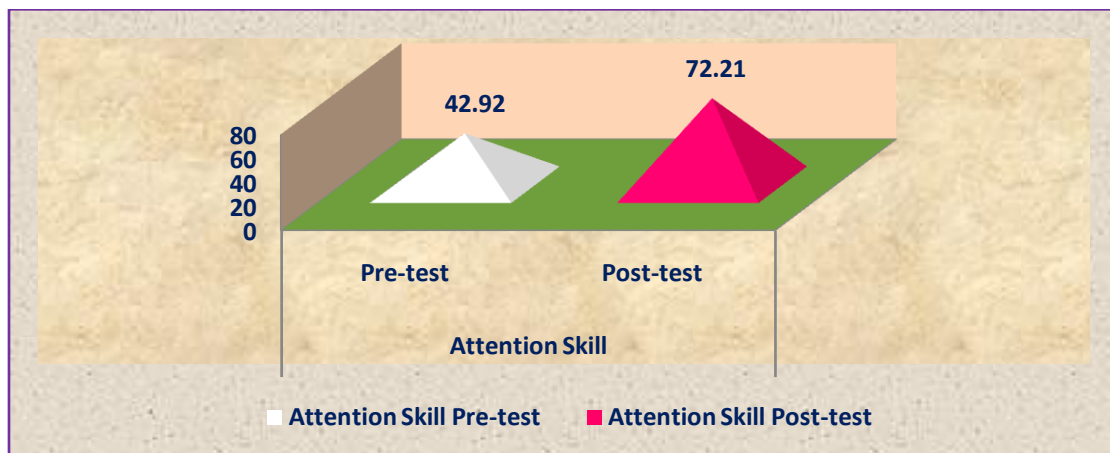
Table 1
Difference between the pre-test and post-test scores of the Attention Skill of the Upper Primary Slow Learners

Skill	Test	Mean	N	S.D	Calculated t value	P value	Remarks
Attention Skill	Pre-test	42.92	24	3.189	23.788	0.000	S
	Post-test	72.21	24	4.443			

Table value of t for df 23 is 2.06, S- Significant

It is inferred from the above table (1) that, the calculated t value (23.788) is greater than the table value (2.06) at 0.05 level of significance. Therefore the hypothesis is accepted. Therefore there is significant difference between the pre-test and post-test scores of the Attention Skill of the Upper Primary Slow Learners who underwent treatment through computer assisted Brain Train Games.

Figure 1
Difference between the pre-test and post-test scores of the Attention Skill of the Upper Primary Slow Learners



It is inferred from the above figure (1) that, the mean score of post -test (72.21) is greater than the mean score of the pre- test (42.92) of the Attention Skill of the Upper Primary Slow Learners.

H2: There is significant difference between the pre-test and post-test scores of the Visuospatial Skill of the Upper Primary Slow Learners who underwent treatment through Computer Assisted Brain-Train Games.

Table 2
Difference between the pre-test and post-test scores of the Visuospatial Skill of the Upper Primary Slow Learners

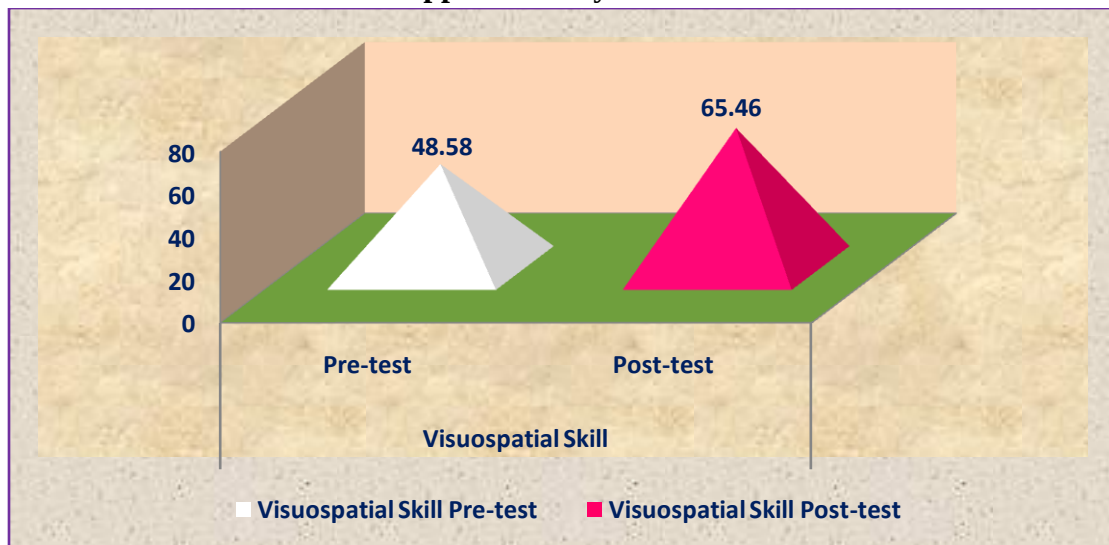
Skill	Test	Mean	N	S.D	Calculated t value	P value	Remarks
Visuospatial	Pre-test	48.58	24	3.463	15.043	0.000	S

Skill	Post-test	65.46	24	3.878
-------	-----------	-------	----	-------

Table value of t for df 23 is 2.06, S - Significant

It is inferred from the above table (2) that, the calculated t value (15.043) is greater than the table value (2.06) at 0.05 level of significance. Therefore the hypothesis is accepted. Therefore there is significant difference between the pre-test and post-test scores of the visuospatial skills of the Upper Primary Slow Learners who underwent treatment through computer assisted brain-train games.

Figure 2
Difference between the pre-test and post-test scores of the Visuospatial Skill of the Upper Primary Slow Learners



It is inferred from the above figure (2) that, the mean score of post-test (65.46) is greater than the mean score of the pre-test (48.58) of the Visuospatial Skill of the Upper Primary Slow Learners

Retention Score Analysis

H3: There is significant difference between the post test and retention test scores of the Attention Skill of the Upper Primary Slow Learners who underwent treatment through computer assisted Brain Train Games.

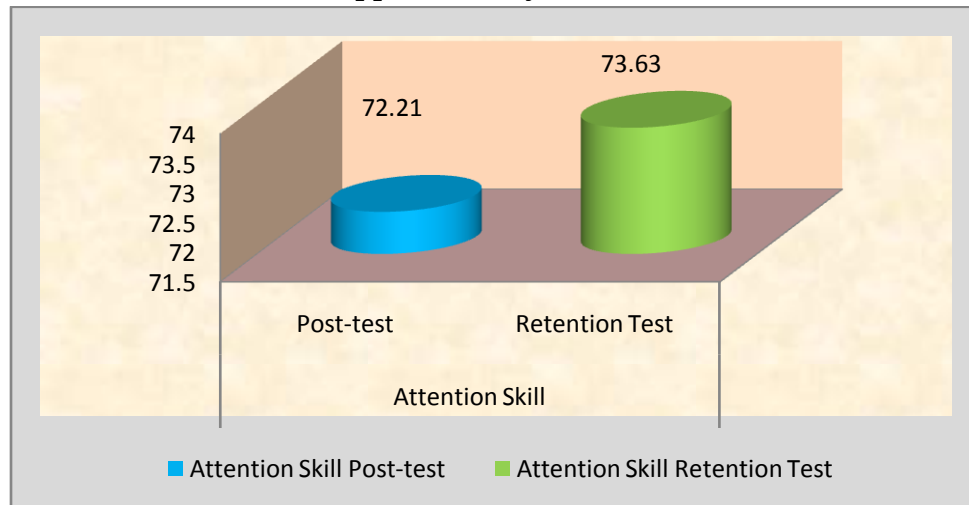
Table 3
Difference between the post test and retention test of the Attention Skill of the Upper Primary Slow Learners

Skill	Test	Mean	N	S.D	Calculated t value	P value	Remarks
Attention Skill	Post-test	72.21	24	4.443	3.593	0.002	S
	Retention Test	73.63	24	3.965			

Table value of t for df 23 is 2.06, S - Significant

It is inferred from the above table (3) that, the calculated t value (3.593) is greater than the table value (2.06) at 0.05 level of significance. Therefore the hypothesis is accepted. Therefore there is significant difference between the post-test and retention test scores of the Attention Skill of the Upper Primary Slow Learners who underwent treatment through computer assisted Brain Train Games.

Figure 3
Difference between the post test and retention test of the Attention Skill of the Upper Primary Slow Learners



It is inferred from the above figure (3) that, the mean score of retention test (73.63) is greater than the mean score of the post-test (72.21) of the Attention Skill of the Upper Primary Slow Learners.

H4: There is significant difference between the post test and retention test scores of the Visuospatial Skill of the Upper Primary Slow Learners who underwent treatment through computer assisted Brain-Train Games.

Table 4
Difference between the post test and retention test of the Visuospatial Skill of the Upper Primary Slow Learners

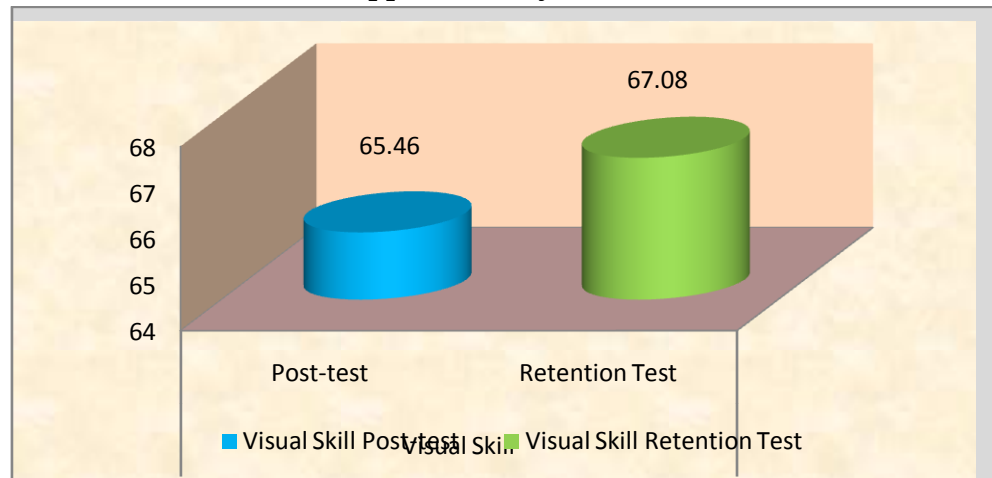
Skill	Test	Mean	N	S.D	Calculated t value	P value	Remarks
Visual Skill	Post-test	65.46	24	3.878	7.542	0.000	S
	Retention Test	67.08	24	4.096			

Table value of t for df 23 is 2.06, S - Significant

It is inferred from the above table (4) that, the calculated t value (7.542) is greater than the table value (2.06) at 0.05 level of significance. Therefore the hypothesis is accepted. Therefore there is significant

difference between the post-test and retention test scores of the Visuospatial Skill of the Upper Primary Slow Learners who underwent treatment through computer assisted Brain-Train Games.

Figure 4
Difference between the post test and retention test of the Visuospatial Skill of the Upper Primary Slow Learners



It is inferred from the above figure (4) that, the mean score of retention test (67.08) is greater than the mean score of the post-test (65.46) of the Visuospatial Skill of the Upper Primary Slow Learners.

LIMITATIONS OF THIS STUDY

- (i) The study focused only on class 9th Slow Learners, the sample might not represent other classes
- (ii) The games selected for Brain Train are limited.

RECOMMENDATIONS

Based on the current search results researcher recommends the Ministry of Education as follows:

- (i) Intensive care and Digital literacy are required to the teachers about Brain Train Games to train the Slow Learners.

- (ii) The results of this study can be used by the administrators and teachers as guide line to handle the Slow Learning Students.
- (iii) These findings may be integrated to other Slow Learners to promote their cognitive skills.

CONCLUSION

Brain Train Games played a vital role in enhancing the cognition of Slow Learners through developing Attention and Visuospatial Skills. Attention is the important element to cultivate the study habits. So this study has provided the clear research outcome where these Brain Train Games are implemented in assisting the Slow Learners to excel in Academic Achievements. The results between Pre-test, Post-test and Retention tests reflect the effect of Brain Train Games in developing cognitive Skills in Slow Learners.

REFERENCE

- Adamson LB, Bakeman R, Suma K, Robins DL. An Expanded View of Joint Attention: Skill, Engagement, and Language in Typical Development and Autism. *Child Dev.* 2019;90(1):e1-e18.
doi:10.1111/cdev.12973
- Anderson, J.R. (2010). *Cognitive Psychology and Its Implications*. New York, NY: Worth Publishers.
- Borah, R. R. (2013). Slow Learners: Role of Teachers and Guardians in Honing their Hidden Skills.
International Journal of Educational Planning and Administration, 3(2), 139-143.
- Capruso, D. X., Hamsher, K. d., & Benton, A. L. (2006). Clinical Evaluation of Visual Perception and Constructional Ability. In P. J. Snyder, P. D. Nussbaum, & D. L. Robins (Eds.), *Clinical neuropsychology: A pocket handbook for assessment* (pp. 547–571). American Psychological Association. <https://doi.org/10.1037/11299-022>
- Chauhan, S. (2011). Slow Learners: their psychology and educational programmes. *International Journal of Multi-disciplinary Research*, 1, 279-289.
- Chica, Ana B.; Bartolomeo, Paolo; Lupiáñez, Juan (2013). "Two cognitive and neural systems for endogenous and exogenous spatial attention". *Behavioural Brain Research*. 237: 107–123. doi:10.1016/j.bbr.2012.09.027. PMID 23000534. S2CID 22314128.
- Gabriele Wulf. (2013) Attentional focus and motor learning: a review of 15 years. *International Review of Sport and Exercise Psychology* 6:1, pages 77-104.
- Holloway, J. H. (2001). Inclusion and students with learning disabilities. *Educational Leadership*, 58(6), 86-88
- Idol, L. (2006). Toward inclusion of special education students in general education. *Remedial and Special Education*, 27(2) 77-94
- Kaznowski, K. (2004). Slow learners: Are educators leaving them behind? *NASSP Bulletin*, 88(641), 31-45.
- Kaznowski, K. L. (2003). A study comparing the school performance of slow learners who qualify for special education with slow learners who do not qualify for special education (Doctoral dissertation, University of Nevada, Reno).
- Kiely, Kim (2014). "Cognitive function". In Michalos, Kim M. (ed.). *Encyclopedia of Quality of Life and Well-Being Research*. Springer. pp. 974–978. doi:10.1007/978-94-007-0753-5_426. ISBN 978-94-007-0752-8.

Krishnakumar, P., Geeta, M. G., & Palat, R. (2006). Effectiveness of individualized educational

program for slow learners. *Indian Journal of Pediatrics*, 73, 135-137

Lee, M (2003). *Educational Psychology: a cognitive view*. New York, Holt Rinehart.

Lohman, A. E. (2011). *Special education learning environments: Inclusion versus self-contained*

(Doctoral dissertation, Lindenwood University)

Marjorie Bernier, Romain Codron, Emilie Thienot, Jean F. Fournier. (2011) *The Attentional Focus of*

Expert Golfers in Training and Competition: A Naturalistic Investigation. *Journal of Applied Sport Psychology* 23:3, pages 326-341.

Placement. (2010). In *Special Education in Plain Language*. Retrieved from

<http://www.specialed.us/Parents/iepprocess/iep3.htm>.

Williams, Ben & Myerson, Joel & Hale, Sandra. (2008). Individual Differences, Intelligence, and Behavior Analysis. *Journal of the experimental analysis of behavior*. 90. 219-31.

10.1901/jeab.2008.90-219.

Zwierko, T., Osinski, W., Lubinski, W., Czepita, D., and Florkiewicz, B. (2010). Speed of visual

sensorimotor processes and conductivity of visual pathway in volleyball players. *J. Hum. Kinet.* 23, 21-27. doi: 10.2478/v10078-010-0003-8