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"EFFECTIVENESS OF BRAIN DOMINANCE STRATEGIES ON ACHIEVEMENTINMATHEMATICSAMONGUPGRADEDSCHOOLSTUDENTS".

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ABSTRACT:

The researcher aims to determine the Effectiveness of Brain DominanceStrategies (BDS) on Achievement in Mathematics (AM) of 8th grade students.The type of this research is a True experimental (Parallel design) study. Thepopulationofthisstudywasthe8thgradestudentsofUpgradedschoolinDavangere District. The sample of this research consisted of two classes namely8th -A grade as an experimental class and 8th - B as a control class. Based on theresultsof the research, it wasobtained that average scoreofthe pre-test inexperimental class is **11.6364** with standard deviation (s) is **3.29600**. After given thetreatment, the average score of the post-test in experimental class is **24.6667** withstandarddeviation(s)is**3.88641**.Accordingtotheobservationofthebraindominanc e strategies, which include teaching and students activities are quiteactive. Based on the results of two tailed t-test for post-test data in experimentalclass was significant. Therefore, Based on the results of this research, it can beconcludedthattheBDSeffectedonstudent'sAMof8thgrade students.

KeyPoint:BDS-BrainDominanceStrategies,AM-AchievementinMathematics

1.0:INTRODUCTION:

The Brain dominance has been considered as the cognitive feature of the students.Brainisthecoordinatingorganofthebody.Itdecidesthenatureofresponsestobedelivered for the stimulus. Hence, the brain has been considered as the controlling part of the livingbeing. Such a significant organ has to be reined and termed in such a way, so to bring thepositive outcome from the learners. The students having the hemispherical dominance canovercome the learning difficulties, can also decide and practice the feasible learning styles.Brain Dominance helps the learners to gain essentialities in the learning sectors as well asreasoningabilitiesandadjustmentbehavior.Thebrainassociatedcopingskillsandpsychological techniques will also make the learners acquire the skill to attain the BrainDominance.

The Brain dominance is a principle which support that a brain is composed by parts,hemisphereorquadrants,notequals,butasymmetricandfunctionallyspecialisedandwhere one part is dominant relatively to the others. The left side of the brain is responsible forcontrolling the right side of the body. It also performs tasks that have to do with logic, Suchas in science and mathematics. On the other hands the right hemisphere coordinates the leftsideofthebody,andperformstasksthathavedonewithcreativityandthearts.

The brain is complex and hard-working organ. It is made up of as many as hundredbillion neurons or brain cells but only weights 3 pounds (1400-2000gm). It is an energy-intensive organ, making up around 2% of a person's weight but using a huge 20% of thebody'senergy.

2.0 :THEORETICALFRAMEWORK:-

Morris(2005) indicated that Ned Hermann who is the father of Brain dominanceTechnology drew on Sperry's work and developed the theory. He then went into develop aquestionnaire.Itiscalledas"HermannBrainDominanceInstrument(HBDI)"Bythismodelthebrainisdividedinto4differentsystemsandstyleswhicharelistedbelow.

A:Leftcerebralhemisphere -
AnalyticalB:Leftlimbicsystem -Sequential
C:RightLimbicsystem -
InterpersonalD:RightCerebralhemisphere-
Imaginative

According to the notes of Morris (2005),"A related but independent theory is thetheory of Multiple intelligences developed by Howard Gardner(1983).He identified seventypesofintelligence.They are,

- Verbal-Linguistic
- Logical-Mathematical
- Visual-spatial
- Body–Kinaesthetic
- Auditory–Musical
- Inter-personalcommunication
- Intra-personalcommunication

Laterheaddedtwomoretheyare,i)Naturalistintelligence&

ii)Existentialistintelligence

Rotter's (1954) social learning theory occurrence of reinforcement is contingent onhis/herownbehaviourfactorofreinforcement.TheyaredividedthefactorsasinternalBrainDominance and external Brain Dominance. According to him internal brain dominanceperceptionofpositiveornegativeevent,takeonceownactions,one'sownpersonalcontrol,give personal efforts and decisions. External brain dominance is the individual's behaviourguidedbyfate,luck andotherexternalcircumstances.

InpsychologyBrainDominancewasoriginallydevelopedbyJulianRotterin1950's.Brain Dominancerepresentshowaperson'sdecision-makingabilityisinfluenced.Essentially those who make choices primarily on their own are considered to have internalbrain dominance people with external brain dominance are generally more likely to bestressed and suffer due to depression as they are more aware of work situations since thosewho make decisionsabout basedmore onwhatother think are saidto have externaldominance".

3.0:NEEDANDIMPORTANCE/SIGNIFICANCEOFTHESTUDY:-

Academicperformanceisassesseddifferentlyinvariouscourses.Inschools,assessment of academic competence is divided into assessment of cognition and assessmentof behaviour in practice as proposed by Miller's hierarchical model in 1990. Cognition orknowledge is assessed most commonly by the written method such as Multiple-ChoiceQuestions(MCQs),ModifiedExtendedQuestions(MEQs),ShortAnswerQuestions(SAQs)

and Essay questions. Assessment of scientific practice is done by Objective StructuredScientificExamination,shortcases,longcasesandcollections.

Many studies have been carried out to associate various factors that may influenceone's academic performance. Different brain dominance amongst individuals is a widelyknownfact.Aseachhemisphereofthebraincontributestocertaindifferentfunctionalitieso fourbody,differentpersonstendtohavetheirownuniquewaysofperceivinggiveninformation and strategize thereafter in order to respond. Different brain dominance affectsthewayinwhichonestudiesthebest.Thereisnodefiniteanswertowhichbraindominancebe longstothemoresuccessfulindividualsaseachhemisphereofthebrainisnotsuperiortothe other, instead have different specialized functions each. However, few researches haveproved that left brain dominant students perform better academically. One of the Factoraffectingacademicperformanceisbraindominance.

Among the learning styles, brain hemisphericity, or to put it in more special terms,brainspecializationhasattractedtheattentionofsomeresearchers.Tendero(2000)reported Sperry'sstudy(1977)inwhichhepropoundedhissplit-brainmodelofintelligenceasaresultofhisworksonaphasicpatients.Inhisseminalworkheattributed somefunctionstodifferenthemispheres of the brain. Brain has two hemispheres that are assigned different functions.Hergenhahn&olson(2005)statedthatbodyfunctionshavebeenassignedtobothhemisp heres"evenlybutinacrossedfashion"(Kok,2010).Simplyput,therighthemisphereisincontroloft heleftsideofthebodyandviceversa.UsingTendero's(2000)metaphoricalstatement about brain dominance, "In a sense, the body cannot serve two masters" We canstatethatoftenonesideofthebrainisdominantovertheother.Inasimilarvein.

Brown(1994)maintainedthat"thelefthemisphereisassociatedwithlogical,analyticalth ought,withmathematicalandlinearprocessingofinformation.Therighthemisphereperceivesand remembersvisual,tactileandauditoryimages;Itismoreefficientinprocessingholistic,integrative andemotionalinformation".

Krashen (1988) maintained that "left hemisphere is superior to the right in judgingtemporalorder,decidingwhichofthetwostimuliwaspresentedfirst".Brown(2007)report sTorrance's study (1980) in which he enumerated some of the features of the left and rightbraindominantlearners:Left-braindominantlearners:Intellectual;remembernames;respondto verbal instruction and explanations; experiment systematically and with control; makeobjectivejudgments;plannedandstructured;preferestablishedcertaininformation;analyti creaders;relianceonlanguageinthinkingandremembering;preferwritingandtalking;prefer

multiple choice tests; control feelings; not good at interpreting body language; rarely usemetaphors;favourlogicalproblemsolving,

Right-braindominantlearners:Intuitive;rememberfaces;respondtodemonstrated ,illustrated or symbolic instructions; experiment randomly and with less restraint; makesubjectivejudgments;fluidandspontaneous;preferelusiveuncertaininformation;synthesizing readers; reliance on images in thinking and remembering; prefer drawing andmanipulatingobjects;preferopen-endedquestions;morefreewithfeelings;goodatinterpretingbodylanguage;frequentlyusemetaphors;favourintuitiveproblemsolving.

This study investigates if students' brain hemisphericity is one of those factorsaffecting Mathematics Achievement. Researchers interested in this sphere, can examine theeffects of different Strategies related to one's brain hemisphericity on learning Mathematicsandrecommendedtoreplicatethisstudyindifferentcontextstoverifyorrejecttheextenttowhichthefindingsofthisresearchcanbegeneralizedtoothercontexts.

4.0 :OBJECTIVE:-

1. Tostudytheeffectivenessofbraindominancestrategiesonachievementin Mathematics.

5.0 :HYPOTHESIS:-

1. Thereisnosignificantdifferenceinpre-testmeanscoreofachievementinMathematicsbetweencontrolandexperimentalgroup.
2. There is nosignificant difference inthepost-testmeanscoresof achievementinMathematicsbetweencontrolandexperimentalgroup.
3. ThereisnosignificantdifferenceinachievementinMathematicsbetweenpre-test&post-testmeanscoresof controlgroup.
4. ThereisnosignificantdifferenceinachievementinMathematicsbetweenpre-test&post-testmeanscoresof Experimentalgroup.
5. ThereisnosignificantdifferenceinachievementinMathematicsbetweenpost-test&delayedpost-testmeanscores.

6.0 :VARIABLESOFTHESTUDY:-

Theinvestigatorselectedthefollowingvariablesforthisstudy.

6.1 :DependantVariable:

MathematicalAchievement

6.2 :IndependentVariable:

- TeachingthroughBrainDominanceStrategies
- ConventionalMethodofteaching

7.0 :RESEARCHMETHODOLOGY:-

In the present study researcher adopted pre-test post-test experimental and controlgroupdesign(parallelgroup)undertrueExperimentalMethod.

7.1 :DESIGNOFTHESTUDY:

	Pre-test	**Treatment**	**Post-test**	**DelayedPost-test**
ExperimentalGroup	AchievementinMathematics	TeachingthroughbraindominanceStrategies	AchievementinMathematics	AchievementinMathematics
ControlGroup	AchievementinMathematics	Teaching throughConventionalApproach	AchievementinMathematics	

8.0 :Sampling:

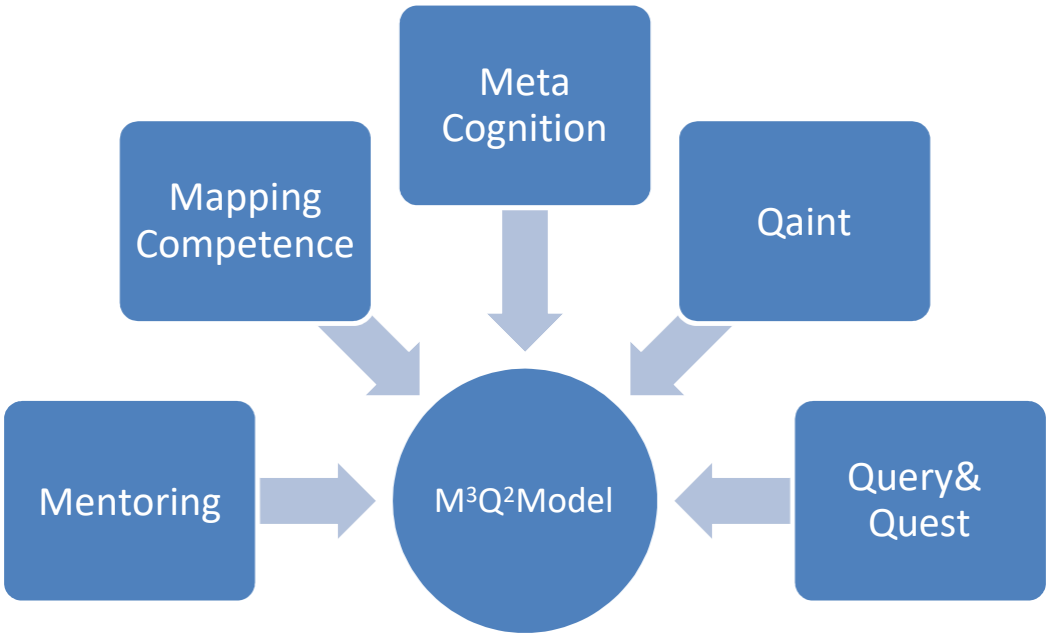
In the present study, researcher adopted purposive sampling technique.Sample of the study consists of each 33 students for both control group andexperimentalgroup.TheyarestudyinginAnjumHigherPrimarySchoolinDavangereDistrict.

Thereare75Studentsin8thgradeofAnjumhigherprimarySchool.Firstly Brain Dominance Scale (SLOT) was given for 75 students to identifydominancylevel.Amongthem66studentsgotleftdominancy,5Studentsgot

Rightdominancy,4Studentsgotwholedominancy.Forleftdominancy66students,Raven'sprogressivematricestest(non-verbal)wasgiventogroupthem into control & experimental group homogenously of 33 students in eachgroup.

8.1 :BrainDominancePackage:

Packageconsistsofteachingandlearningstrategies.Teachingwasdonebyusing M^3,Q^2Modelpreparedbytheresearcheraftervalidatingbytheexperts.Learnerswereactivelyparticipatedindifferentactivitiesandselfpreparedmodels.



- Mentoring:-Advicetoalearner.
- MappingCompetence:-Planning&PresentingInformationinVisualmode.
- MetaCognition:-Abilitytoreflectone'sownthinkingandlearning.
- Quaint:-Attractive&UniqueMethods,Chartsetc.
- Query&Quest:-aquestion,aninquiry,doubtoractofreachingforsomething

9.0:TOOLSFORTHESTUDY:

Thefollowingtoolwillbeusedforthepresentstudy.

SlNo.	Nameofthetool	DevelopedBy
1.	BrainDominanceScale(SOLAT)	DevelopedbyVenkataraman
2.	Brain Dominance strategiesPackage	DevelopedbyResearcher.Itinvolvesteachingandlearning Strategies.
3.	AchievementinMathematics	DevelopedbyResearcher.Itconsistsof 30questionsfromthreeareasofMathematics Such as Arithmetic, Algebra&Geometry (10 questions from each Area)

10.0:STATISTICALANALYSISANDINTERPRETATIONOFDATA

Hypothesis-1

Thereisnosignificantdifferenceinpre-testmeanscoreofachievementinMathematicsbetweencontrolandexperimentalgroup.

AchievementInMathematics		Mean	N	Std.Deviation	Gains cores	t-value	Level of significance at0.01level
PRE-TEST	Experimental Group	11.6364	33	3.29600	-0.24242	0.342	Not-significant
	Control Group	11.8788	33	2.61913			

Interpretation:

The table reveals that, obtained t-value 0.342 is less than theoretical value 2.56. So,the obtained t-value is not significant at 0.01 level of significance. Hence accepted the nullhypothesisanditisconcludedthat“Thereisnosignificantdifferenceinpre-testmeanscore

of achievement in Mathematics between control and experimental group". The mean of theboth the groups are 11.6364 and 11.8788; SD is 3.29600 and 2.61913 respectively & gainScoreis-0.24242.Hencethemeanwerealmostsame.Consequentlyitisassuredthatboththegroupswereequivalenttoeachotherbeforebeginningoftheexperiment.

Hypothesis-2

Thereisnosignificantdifferenceinthepost-testmeanscoresofachievementinMathematicsbetweencontrolandexperimentalgroup.

AchievementInMathematics		Mean	N	Std. Deviation	Gain scores	t-value	Level ofsignificanceat0.01 level
POST-TEST	**Experimental Group**	24.6667	33	3.88641	11.84848	12.762	Significant
	Control Group	12.8182	33	2.95227			

Interpretation:

Thetablerevealsthattheobtainedt-value12.762isgreaterthanthetheoreticalvalue 2.56. at 0.01 level of significance. Hence, the null hypothesis is rejected and formulatedalternativehypothesisthatis,"Thereisasignificantdifferenceinthepost-testmeanscoresofachievement in Mathematics between control and experimental group". The mean scores ofthe both the groups are 24.6667 and 12.8182, SD are 3.88641 and 2.95227 respectively &gainScoreis12.762.ThereforeMathematicalAchievementofExperimentalGroupishigherthan Control group after giving treatment for Experimental group. Teaching through BrainDominance Strategies is more effective on achievement in Mathematics compare withteachingthroughtraditionalmethod.

Hypothesis-3

Thereisnosignificantdifferenceinachievementin Mathematicsbetweenpre-test&post-testmeanscoresofcontrolgroup.

AchievementInMathematics		Mean	N	Std.Deviation	Gainscores	t-value	Levelofsignificanceat0.01 level
CONTROL GROUP	Pre-Test	11.8788	33	2.61913	-0.93939	2.087	Not Significant
	Post-Test	12.8182	33	2.95227			

Interpretation:

The table reveals that, obtained t-value 2.087 is less than theoretical value 2.56. So,the obtained t-value is not significant at 0.01 level of significance. Hence accepted the nullhypothesis and it is concluded that "There is no significant difference in achievement inMathematics between pre-test & post-test mean scores of control group". The mean of theboth the groups are 11.8788 and 12.8182, SD are 2.61913 and 2.95227 respectively & gainScoreis-0.93939.Thereforethemeanwerealmostsame.Consequentlyitisassuredthatboththetestswereequivalenttoeachotheraftertraditionalclass.

Hypothesis-4

Thereisnosignificantdifferenceinachievementin Mathematicsbetweenpre-test&post-testmeanscoresofExperimentalgroup.

AchievementInMathematics		Mean	N	Std. Deviation	Gain scores	t-value	Level ofsignificanceat0.01 level
EXPERIMENTAL GROUP	PRE-TEST	11.6364	33	3.29600	-13.03030	16.571	Significant
	Post-Test	24.6667	33	3.88641			

Interpretation:

Thetablerevealsthattheobtainedt-value16.571isgreaterthanthetheoreticalvalue 2.56. at 0.01 level of significance. Hence, the null hypothesis is rejected and formulatedalternative hypothesis as "There is a significant difference in achievement in Mathematicsbetweenpre-test & post-test meanscores ofExperimentalgroup".Themeanofthebothe

groups are 11.6364 and 24.6667, SD are 3.29600 and 3.88641 respectively & gain Score is13.03030.ThereforeMathematicalAchievementofExperimentalGroupishigherinposttestafter experimentaltreatment.

Hypothesis-5

ThereisnosignificantdifferenceinachievementinMathematicsbetweenpost-test&delayedpost-testmeanscores.

AchievementInMathematics		Mean	N	Std.Deviation	Gains cores	t-value	Levelofsignificanceat 0.01 level
EXPERIMENTALGROUP	Post-Test	24.6667	33	3.88641	-1.63636	3.103	Significant
	Delayed Post Test	26.3030	33	2.53087			

Interpretation:

Thetablerevealsthattheobtainedt-value3.103isgreaterthanthetheoreticalvalue 2.56. at 0.01 level of significance. Hence, the null hypothesis is rejected and formulatedalternativehypothesisas"ThereisasignificantdifferenceinMathematicsbetweenpost-test&delayedpost-testmeanscores".Themeanofthebothgroupsare24.6667and26.3030,SD are 3.88641 and 2.53087 respectively & gain Score is -1.63636. Therefore MathematicalAchievementof Experimental Groupis higherin delayed posttestafterexperimentaltreatment using Brain Dominance Strategies. This shows that experimental treatment willhelpstudentstoretainMathematicalconceptsforlongertime.

11.0 :MAJORFINDINGS

1. Thereisnosignificantdifferenceinpre-testmeanscoreofachievementinMathematics between control and experimental group. The mean were almost same.Consequently it is assured that both the groups were equivalent to each other beforebeginningoftheexperiment.
2. Teaching through Brain Dominance Strategies is more effective on achievement inMathematicscomparewithteachingthroughtraditionalmethod.SoThereisasignificant difference in the post-test mean scores of achievement in Mathematicsbetweencontrolandexperimentalgroup

3. Thereisnosignificantdifferenceinachievementin Mathematicsbetweenpre-test&post-testmeanscoresofcontrolgroup.Themeanwerealmostsame.Consequentlyitisassuredthatboththetestswereequivalenttoeachotheraftertraditionalclass
4. MathematicalAchievementofExperimentalGroupishigherinposttestafterexperimental treatment.SoThereisasignificantdifferenceinachievementinMathematicsbetweenpre-test&post-testmeanscoresofExperimentalgroup.
5. ExperimentaltreatmentwillhelpstudentstoretainMathematicalconceptsforlongertime. So "There is a significant difference in Achievement inMathematics betweenpost-test&delayedpost-testmeanscores"

12.0 :Conclusion&suggestion:

Based on the results of the research and discussion as well as conclusions,theauthorswouldliketogivesuggestionstocarryoutfurtherresearchtostudents at different levels of education units, and by taking a larger sample.Thus, these Strategies isexpected to be used as one of the importantindicatorsin the preparation of the curriculum, especially in Mathematics lessons that areeven better in the future. This study shows that there is a significant effect ofBrainDominanceStrategiesonthestudents'academicachievementinMathematicsamong8thgrade studentsofDavangereDistrict.

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