CHAPTER – II
REVIEW OF RELATED LITERATURE

2.1. INTRODUCTION

Related literature is the foundation on which any future study can be found which provides ideas, theories, explanations, hypothesis, method of research and other valuable information regarding the problem in hand. Aggarwal, J.C. (1966) says study of related literature implies locating, reading and evaluating reports of research as well as reports of casual observation and opinion that are related to the individual’s planned research project (P. 87). Review of related studies helps the researcher to understand what is already known, what others have attempted to find out and what one can add to it. Thus it is a complete picture of the background of one’s study which is put together in step by step.

Since effective research is based upon past knowledge, this step helps to eliminate the duplication of what has been done and provides suggestions for significant investigations.

With these in view, the specific studies already available on variables associated with the current theme have been surveyed and brief accounts are presented below:

2.2. STUDIES IN ABSTRACT FORM

Knecht, S. et al., (2000) conducted a study on “Handedness and Hemispheric Language Dominance in Healthy Humans”. In this study, to clarify the relationship between handedness and language dominance in healthy subjects, the investigators measured lateralization directly by functional transcranial Doppler sonography in 326 healthy individuals using a word-generation task. The incidence of right-hemisphere language dominance was found to increase linearly with the degree of left-handedness, from 4% in strong right-handers (handedness = 100) to 15% in ambidextrous individuals and 27% in strong left-handers (handedness = −100). The relationship could be approximated by the formula: likelihood of right hemisphere language dominance (%) = 15% – handedness (%) 10. These results clearly demonstrate that the relationship
between handedness and language dominance is not an artefact of cerebral pathology but a natural phenomenon.

Ramsey, N.F. et al., (2001) conducted a study on “Combined Analysis of Language Tasks in fMRI Improves Assessment of Hemispheric Dominance for Language Functions in Individual Subjects”. The investigators present a simple method to assess language lateralization that allows for some variation of tasks and statistical thresholding, but at the same time yields reliable and reproducible results. Images acquired during a set of word-comprehension and production tasks are analyzed conjointly. As opposed to the use of any one particular task, this combined task analysis (CTA) approach is geared toward identifying language regions that are involved in generic language functions rather than regions that are involved in functions that are specific to a single task. In two experiments CTA is compared to single-task analysis in healthy right-handed males. In a third experiment left-handed males were examined. Results indicate that CTA: (1) improves detection of language-related brain activity in individual subjects and (2) yields a high language laterality index (LI) in right-handed males with a small variance across subjects. The high LI matches the strong left-hemisphere dominance for language that is typical for these subjects as reported in neuropsychological and clinical tests in other studies. In the left-handed subjects dominance was found either in the left (n = 4) or the right (n = 1) hemisphere or was absent (n = 3). The LI derived from CTA is more consistent across statistical thresholds for significance of signal change in fMRI analysis than in individual-task analysis. Also, the CTA results are very similar to those obtained with conjunction analysis of the same data.

Mark A. Runco and Diane J. Johnson (2002) conducted a study on “Parents’ and Teachers’ Implicit Theories of Children's Creativity: A Cross-Cultural Perspective”. The results indicated that all groups distinguished between indicative and contraindicative aspects of creativity and, for the most part, viewed creative traits desirably. These results were qualified by the adjectives that received high ratings for creativity but significantly lower ratings for desirability. These provided evidence that creativity and desirability are related yet separate constructs and that parents and teachers recognize that some traits associated with creativity may be undesirable. Multiple analysis of variance (MANOVA) revealed significant differences between the United
States and India for intellectual and attitudinal clusters of adjectives, p < .001; however, parent and teacher differences were not found, p > .05. These findings support the notion that implicit theories are influenced by cultural traditions and expectations.

Gayle T. Dow and Richard E. Mayer (2004) conducted a study on “Teaching Students to Solve Insight Problems: Evidence for Domain Specificity in Creativity Training”. The purpose of this research was to investigate whether insight problem solving depends on domain-specific or domain-general problem-solving skills, that is, whether people think in terms of conceptually different types of insight problems. In Study 1, participants sorted insight problems into categories. A cluster analysis revealed 4 main categories of insight problems: verbal, mathematical, spatial, and a combination of verbal or spatial. In Studies 2 and 3, participants received training in how to solve verbal, spatial, or mathematical problems, or all 3 types. They were taught that solutions to verbal insight problems lie in defining and analyzing the terms in the problem, solutions to mathematical insight problems lie in a novel approach to numbers, or solutions to spatial insight problems lie in removing a self-imposed constraint. In both studies, the spatial trained group performed better than the verbal trained group on spatial problems but not on other types of problems. These findings are consistent with the idea that people mentally separate insight problems into distinct types. Implications for instruction in insight problem solving are discussed.

Abeare, Christopher A. (2005) conducted a study on “The Hemispheric Dynamics of Semantic Processing and Creativity”. In this study, visual half-field semantic priming with high, low and unrelated prime-target pairs were employed in a lexical decision paradigm. Four stimulus onset asynchronies (SOA) were used in a within subjects design. Creativity was measured using the Torrance Tests of Creativity. The high creative group showed more right hemisphere priming during the 400 ms SOA. In addition, there was an interaction with task order effect such that the high creatives who were administered the creativity tests showed overall more right hemisphere priming. Results are discussed in the context of the time-course of processing and controlled vs. automatic processes.

Jennifer L. Butcher and Larissa N. Niec (2005) conducted a study on “Disruptive Behaviors and Creativity in Childhood: The Importance of Affect Regulation”. This study examined the role of affect regulation and negative affect
expression in the relationship between disruptive behaviors and creativity. Seventy 6- to 10-year-old children completed measures to assess divergent thinking and affect expression in fantasy play. Parents completed measures of children's creativity, affect regulation, and behavioral functioning. Results indicated that higher levels of disruptive behaviors related to lower levels of creativity on divergent thinking tasks and by parent report. Affect regulation mediated the relationship. Results failed to support a relationship between negative affect expression in play and creativity, although greater levels of negative affect expression related to higher levels of disruptive behaviors. Results highlight the importance of affect regulation for both behavioral functioning and adaptive traits including creative achievement.

Terri R. Kurtzberg (2005) conducted a study on “Feeling Creative, Being Creative: An Empirical Study of Diversity and Creativity in Teams”. Two empirical studies explored objectively measured creative fluency and subjectively perceived creativity in cognitively diverse teams. Results indicate that cognitive diversity may be beneficial for objective functioning but may damage team satisfaction, affect, and members' impressions of their creative performance. Subjective ratings diverged greatly from more objective measures and were more closely related to affective measures. The overall findings present creativity as a complex multidimensional construct, and cognitive diversity as an important predictor of both team emotions and outcomes. Arguments are presented for the value of subjectively perceived creativity, even in the absence of more concrete performance in the immediate time period.

Eva V. Hoff (2005) conducted a study on “Imaginary Companions, Creativity, and Self-Image in Middle Childhood”. This study investigates 4 questions: First, whether there is a relationship between imaginary companions and creative potential; second, whether children with negative self-images are more likely to have imaginary companions; third, whether there are gender differences among those children who have imaginary companions; and, finally, what aspects of imaginary companions and what characteristics of those who invent them are related to creativity. The measurements used were a questionnaire about imaginary companions, 3 estimates of creative potential, and a self-image inventory. Among the 69 participating 4th graders, 52% reported having (had) imaginary companions. The children with imaginary companions were more creative on 2 of 3 estimates of creativity and had lower self-image scores. The self-image
differences were greatest on the subscales measuring psychological well-being and peer relations. It was more common for girls to have imaginary companions. Aspects associated with creativity among the children with imaginary companions were, for example, elaboration of the companion's character and number of imaginary companions.

**Le Roy, Jennifer R. (2006)** conducted a study on “A Description of the Caregiver Left Cradling Preference with respect to Right Hemispheric Specializations”. Past research suggests that at least 75% of females prefer to hold infants to the left of their body midline. Numerous hypotheses have been proposed as to why this phenomenon exists, but none have been able to fully incorporate all existing data. The present study assessed a proposed explanation of cradling preferences regarding hemispheric specialization for the perception of facial emotion with mothers. One hundred right- and left-handed female participants were given a series of tests to determine handedness, hemispheric specialization, and cradling preference. Chi-square analyses were conducted to determine if a significant difference existed between mothers who are left-hemispherically lateralized and mothers who were right-hemispherically lateralized. Results confirmed previous findings that women tend to cradle infants leftward, that mothers are more lateralized to their right hemispheres. However, cradling bias was unrelated to handedness or hemispheric lateralization.

**MacLean, Susan (2006)** conducted a study on “The Link between Creativity and Affect in Adolescents”. This study attempted to extend existing research on the link between creativity and affective illness in adults (e.g., Andreasen, 1987; Jamison, 1989; Schildkraut, Hirshfeld, and Murphy, 1994) by examining the relationship between creative personality traits and affective tendencies in adolescents. The sample consisted of 104 students in grades 10, 11, and 12. Creative personality was assessed using the Creative Personality Scale of the Adjective Checklist, as well as measures of origence and intellectence. Affective tendencies were measured using the General Behaviour Inventory which assesses depressive and hypomanic-plus-biphasic tendencies. Results of the study provided some support for the hypothesis that creative personality is related to measures of affective tendencies in adolescents. However, contrary to what was predicted, measures of creative personality were better predictors of depression scores.
rather than biphasic-plus-hypomanic scores. Specifically, high origence and intellectence scores appeared to be the best predictors of depression scores.

**Gulledge, Jonathan Paul (2006)** conducted a study on “*Hemispheric Differences in Numerical Cognition: A Comparative Investigation of how Primates Process Numerosity*”. Four experiments, using both humans and monkeys as participants, were conducted to investigate the similarities and differences in human and nonhuman primate numerical cognition. In Experiment 1 it was determined that both humans and monkeys display a SNARC effect, with similar symbolic distance effects for both species. In addition, both species were found to respond faster to congruent stimulus pairs. In Experiment 2 both species were found accurately to recognize quantitative stimuli when presented for durations of 150 msec in a divided visual field paradigm. Performance for humans and monkeys for numerals and dot-patterns was almost identical in terms of accuracy and response times. In Experiment 3 participants were required to make relative numerosness judgments in a divided visual field paradigm. Both species responded faster and more accurately to stimuli presented to the right visual field. Species differences appeared, with monkeys performing equally well on both trial types whereas the humans performed better on numeral trials than on dot trials. In Experiment 4 repetitive transcranial magnetic stimulation (rTMS) was combined with the divided visual field paradigm. Accuracy was significantly disrupted for both species when compared to a no stimulation condition. A facilitation effect was also evident with both species exhibiting significant decreases in response time for all trials. Right-handed participants took longer to respond to stimuli presented to the left visual field. These findings add to the body of knowledge regarding both the similarities and differences of how quantitative stimuli are processed by humans and monkeys.

**Liu, Li-Ming (2007)** conducted a study on “*The Relationships between Creativity, Drawing Ability, and Visual/Spatial Intelligence: A Study of Taiwan's Third-Grade Children*”. The purpose of this study was to examine the relationships between the qualities of creativity, drawing ability, and visual/spatial intelligence of selected third-grade students in the Hsinchu area of Taiwan, Republic of China. The population for this study included approximately 11,653 third-grade students from 99 public elementary schools. Subjects were randomly selected from 16 out of 99 elementary schools. The "Milne-Kasen Story Pictures" (A Test for Creativity), the "Young Visual
Artist's Checklist", the "Portfolio Review Measurement", the classroom teacher's nomination of "Milne-Kasen Visual/Spatial Intelligence Checklist" were given to 427 selected students. Data were processed, analyzed, and reported using descriptive and inferential statistics. The findings revealed that positive relationships exist between a child's creativity potential and self-image of artistic ability and local art educators' observations of students' artwork and classroom teachers' observations of student's art-related behaviors. There were significant differences in responses based upon the demographic factors of gender, community, age, and time of test taking. These findings should impact the delivery of art education to children at the elementary school level. In addition, it might influence the development of the art education curriculum in Taiwan.

Aldous, Carol R. (2007) conducted a study on “Creativity, Problem Solving and Innovative Science: Insights from History, Cognitive Psychology and Neuroscience”. This paper examines the intersection between creativity, problem solving, cognitive psychology and neuroscience in a discussion surrounding the genesis of new ideas and innovative science. Three creative activities are considered. These are (a) the interaction between visual-spatial and analytical or verbal reasoning, (b) attending to feeling in listening to the "self", and (c) the interaction between conscious and non-conscious reasoning. Evidence for the importance of each of these activities to the creative process is drawn from (a) historical and introspective accounts of novel problem solving by noted scientists and mathematicians; (b) cognitive psychology and neuroscience; and (c) a recent empirical study of novel mathematics problem solving. An explanation of these activities is given in terms of cognitive neuroscience. A conceptual framework connecting each of these activities is presented and the implications for learning and teaching considered.

Giguere, Miriam (2011) conducted a study on “Social Influences on the Creative Process: An Examination of Children's Creativity and Learning in Dance”. The purpose of this paper is to look at the influences of social interaction and learning environment on children's creativity in dance. Data from two separate studies are examined in which a total of thirty-seven fifth grade students created nine dances. This examination aims to (1) identify crucial elements of the classroom environment, which aided the students' productivity and cognitive activity; and (2) look at how working as a peer group affected the participants' creative process.
2.3. RELATED INDIAN STUDIES

Study – 1

Investigator : Kumar, Sudheesh P.K. (1994)

Title : Interaction Effect of Intelligence, Cognitive Style and Approaches to Studying on Achievement in Biology of Secondary School Pupils.

The objective of the study was to study the main and interaction effect of the three selected independent variables on achievement in biology of secondary school pupils for the total sample and the sub-samples based on sex.

The study was carried out on a representative sample of 700 secondary school students of the State of Kerala. Proportionate stratified sampling procedure with representation given to sex, locale, instructional efficiency and management category of schools was used. Tools used included Raven’s Standard Progressive Matrices, Group Embedded Figures Test of Oltman, Educational Technology and Science Studying Approach Inventory of Pillai, Educational Technology and Achievement Test in Biology of Kumar, S.P.K. The collected data were treated with Three-way ANOVA with $3 \times 3 \times 2$ factorial design followed by Scheffe Test of Multiple Comparison and t-tests.

The major findings were: (1) Regarding main effect of intelligence, significant main effect was noticed on achievement in biology for the total sample and for sub-samples, boys (except for higher objective) and girls in two dimensions of approaches to studying. (2) There was no significant main effect of cognitive style on achievement in biology for the total sample for boys. For girls, this variable had significant main effect on achievement in biology and in comprehension category. (3) Regarding main effect of approaches to studying significant main effect of deep/surface approach existed on achievement in biology, Total score, comprehension and in higher objective category for the total sample. In knowledge and application categories no significant main effect of deep / surface approach was found. For boys significant main effect existed on comprehension category only. Among girls significant main effect existed on achievement in biology, total score, comprehension and in higher objectives categories. There was no significant main effect on knowledge and application categories of achievement in biology. Regarding organized / disorganized method, there was significant main effect on comprehension category for the total sample and on comprehension and higher objectives category for girls, but not for boys. (4) There was
no first order interactions of intelligence × cognitive style; intelligence × deep / surface approach; cognitive style × deep / surface approach on achievement in biology. (5) There was significant first order interaction of cognitive style × organized/ disorganized method on higher objectives category and no significant first order interaction of the above variables in combination on achievement in biology, total score, knowledge, comprehension and application categories. (6) On achievement in biology, total score, comprehension, application and higher objectives categories no significant first order interactions were found. (7) There was no significant second order interaction of intelligence × cognitive style × deep / surface approach or organized / disorganized method on achievement in biology.

Study – 2


Title : A Study of Styles of Learning and Thinking in Relation to Cognitive Style, Creativity and Achievement in Science at High School Level.

The objectives of study were (1) To study the extent of distribution of hemisphericity among the students studying science at high school level. (2) To study the extent of distribution of cognitive styles (Field dependence, Field independence) among the students studying science at high school level. (3) To study the extent of distribution of creative abilities among the students studying science at high school level. (4) To study the extent of distribution of achievement among the students studying science at high school level. (5) To study the relationships of hemisphericity with creative abilities: (a) fluency, (b) flexibility, (c) originality, (d) creativity. (6) To study the relationships of hemisphericity with respect to achievement component: (a) knowledge, (b) understanding, (c) application, (d) achievement. (7) To study the difference between the rural and urban students studying science at high school level with respect to: (a) hemisphericity, (b) cognitive style, (c) creative abilities, (d) achievement in science. (8) To study the sex difference between boys and girls studying science at high school level with respect to: (a) hemisphericity, (b) cognitive style, (c) creative abilities, (d) achievement in science. (9) To develop and standardize the test of achievement in science. (10) To suggest measures for incorporating the application of research findings in educational system and programs with a view to make them meaningful, comprehensive and effective for the development of human resources.
The sample comprised of 500 students selected through stratified random sampling technique. The following tools were used to collect data: (i) The Test of Style of Learning and Thinking developed by Torrance and Reynolds. This test was used to identify hemisphericity. The test-retest reliability for right, left and integrated were 0.50, 0.70 and 0.60 respectively. (2) The Witken’s Group Embedded Figure Test developed by Witkn et al. was used to asses field dependent-independent dimensions of cognitive style. (3) Mehadi’s Verbal Test of Creative Thinking developed by Mehdi was used to asses creativity. The test-retest reliability ranges from 0.90 to 0.96. (4) Achievement test was developed by the investigator to asses achievement in science for class X students. The split half reliability was found to be 0.84 and the criterion validity was found to be 0.86. The data were analyzed by using ANOVA, t-test, Pearson’s Product Moment Correlation, Multiple Regression Analysis.

The findings of study were – (1) The three groups of hemisphericity (right, left and integrated) do not significantly differ from each other with respect to cognitive style. (2) The three groups of hemisphericity (right, left and integrated) differ significantly from each other with respect to creativity. The students who were dominated by right hemisphericity were found to be more fluent, more flexible and more original and more creative in thinking than the students who were dominated by integrated hemisphericity and who were dominated by left hemisphericity. The students who were dominated by integrated hemisphericity were found to be more fluent, more flexible, more original and more creative in thinking than the students who were dominated by the left hemisphericity. (3) The three groups of hemisphericity (right, left and integrated) differ significantly from each other with respect to achievement. The students who were dominated by right hemisphericity were better than the students who were dominated by integrated hemisphericity and left hemisphericity. The students who were dominated by integrated hemisphericity were better in achievement in science than the students who were dominated by left hemisphericity. (4) There is no significant sex difference of means with respect to cognitive style. (5) There is no significant sex difference of means with respect to creative abilities. In case of fluency, flexibility, originality and creativity between boys and girls differed insignificant from each other. There is no significant sex difference with respect to right dominant hemisphericity. There is no significant sex difference with respect to left dominant hemisphericity. (6) There is a significant sex difference of means with respect to achievement in science. Boys were better than the girls in each component of achievement in science (knowledge, application,
understanding and achievement). (7) There is no significant difference of means with respect to cognitive style between urban and rural students. There is significant difference of means with respect to creative abilities between urban and rural students. In case of hemisphericity, it is found that there is no significant difference of means with respect to three groups of hemisphericity between urban and rural students. In case of achievement, it is found that there is no significant difference of means with respect to the achievement between urban and rural students. (8) Left hemisphericity is negatively correlated with the achievement, it means students who are dominated by the left hemisphericity are poor in achievement. The integrated hemisphericity is not significantly correlated with the achievement. The right hemisphericity is positively correlated with the achievement. (9) Left hemisphericity is negatively correlated with creativity. It means that students who are dominated by the left hemisphericity are poor in creative thinking. Students who are dominated by the integrated hemisphericity are poor in creative thinking, the students who are dominated by right hemisphericity are rich in creative thinking.

Study – 3


Title : An Analytical Study of Pre B.Ed. Test Results in Relation to Interest, Intelligence, Creativity and Achievement of B.Ed. Pupil Teachers of Barkatullah University.

The objectives of study were: (1) To study the relationship of B.Ed. final achievement with (a) Pre B.Ed. achievement, (b) interest in teaching activities, (c) intelligence, and (d) creativity. (2) To study the relationship of Pre B.Ed. achievement with (a) intelligence, (b) interest in teaching activities and (c) creativity. (3) To study the relationship of intelligence with interest in teaching activities and creativity separately. (4) To study the relationship of creativity with interest in teaching activities. (5) To study the contribution of Pre B.Ed. achievement to B.Ed. final achievement. (6) To study the sex difference with respect to (a) Pre B.Ed. final achievement, (b) B.Ed. final achievement, (c) intelligence, (d) interest in teaching activities and (e) creativity. (7) To study the difference between high achievers and low achievers in B.Ed. final in terms of (a) interest in teaching, (b) Pre B.Ed. achievement, (c) creativity and (d) intelligence.

The sample of the present study consisting of 500 pupil-teachers randomly drawn from all colleges of education affiliated to the Baraktullah University, Bhopal. Following
tools were used to collect the data: (1) Standard Progressive Matrices developed by Raven was used to assess intelligence. (2) Mehdi’s Verbal Test of Creative Thinking developed by Mehdi was used to assess creativity. (3) To assess interest in teaching activity, investigator developed the Interest Inventory. (4) For determining the B.Ed. achievement marks obtained by the pupil-teachers in theory, practical and total B.Ed. marks were collected with the help of set proforma developed by the investigator. (5) For determining the Pre B.Ed. achievement, the scores from the actual mark sheets were recorded. Mean, SD, t-test, Pearson’s Product Moment Correlation, ANOVA and multiple regression analysis were used to analyze the data.

The findings of study were: (1) There was significant correlation among the components of B.Ed. achievement and the components of Pre B.Ed. achievement. (2) There was significant correlation between intelligence and the theory component of B.Ed. achievement but it had insignificant relationship with practical examination scores adolescence and the total B.Ed. achievement scores. (3) There was insignificant correlation of interest in teaching activities with theory, practical and total B.Ed. achievement. (4) There was almost insignificant correlation between the component of B.Ed. achievement and the components of creativity, except for the practical component of B.Ed. achievement. (5) There was significant correlation between the components of Pre B.Ed. and intelligence. (6) There was significant correlation between interest in teaching activities and the component of general mental ability, general awareness, teaching aptitude, current affairs and language ability and total Pre B.Ed. achievement. (7) There was significant correlation between the components of B.Ed. achievement and the components of creativity. (8) There was significant correlation between interest in teaching activities and intelligence. (9) There was significant correlation between intelligence and the components of creativity. (10) There was significant contribution of independent variables like general mental ability, general awareness, teaching aptitude, current affairs, and language ability to the dependent variable theory component of B.Ed. achievement. (11) There was significant contribution of independent variables (teaching aptitude, current affairs, language ability) to the dependent variable, namely, practical components of B.Ed. achievement. (12) There was significant contribution of independent variables (teaching aptitude, current affairs, language ability, general mental ability and general awareness) to the dependent variable, namely B.Ed. achievement. (13A) There were significant sex difference with respect to (a) theory component of B.Ed. achievement, (b) total B.Ed. achievement, (c) intelligence, (d) fluency factor of
creativity (e) flexibility factor of creativity, (f) originality factor of creativity, (g) creativity, (h) general mental ability and general awareness components of Pre B.Ed. test, (i) teaching aptitude, current affairs and language ability components of Pre B.Ed. test, and (j) Pre B.Ed. achievement. (13B) There was insignificant sex difference with respect to (a) practical component of B.Ed. achievement and (b) interest in teaching activities. (14A) There were significant differences between the upper and the lower groups of pupil-teachers with respect to (a) fluency factor of creativity, (b) flexibility factor of creativity, (c) originality factor of creativity, (d) creativity, (e) general mental ability and general awareness components of Pre B.Ed., (f) teaching aptitude, current affairs and language ability components of Pre B.Ed. test, and (g) Pre B.Ed. achievement, all in favor of females. (14B) There were insignificant differences between the upper and the lower groups of pupil-teachers with respect to (a) intelligence and (b) interest in teaching activities.

Study – 4


Title : Hemisphericity and Achievement of Class XI Students Studying History in Higher Secondary School.

The objectives were: (1) To find out the significant difference, if any, in achievement in history of higher secondary students with right, left and integrated hemisphere dominance; (2) to find out the correlation, if any, between hemisphericity and achievement of higher secondary students in history.

Descriptive normative survey method was adopted in the study. A sample of 300 students studying History at Class IX in Higher Secondary schools in Thanjavur District in Tamil Nadu, using stratified random sampling technique was adopted for the study. The tools used were Style of Learning and Thinking Test and Achievement Test.

The findings were: (1) There was significant difference in achievement between the students with right and integrated hemisphere dominance. (2) There was no significant difference in achievement in history between the students with left and right and left and integrated hemisphere dominance. (3) There was significant correlation between right and integrated hemisphere dominance and achievement in history of the students. It inferred that the right hemisphere dominance contributes more to the achievement than the integrated hemisphere dominance. The study suggested for further
study that by activating the right hemisphere of the brain, the achievement of the students in history subject can be improved. It can be implemented in other subjects also.

Study – 5


Title : The Influence of Intelligence and Creativity on the Achievement in Mathematics Among X Class Students of Visakhapatnam District: A Relational Study.

The objectives of study were: (1) To identify the levels of intelligence, creativity and achievement in mathematics among X class students in the selected secondary schools of Visakhapatnam district. (2) To find the differences, if any, between the measures of intelligence, creativity and achievement in mathematics of the subgroups boys and girls, rural and urban school students, government and private school students, and students of Telugu medium and English medium schools. (3) To identify the relationship between intelligence and creativity among the X class students. (4) To identify the relationship between intelligence and achievement in mathematics among the X students. (5) To identify the relationship between creativity and achievement in mathematics among the X class students.

For the study, sample comprised to 2000 students of class X studying in English and Telugu medium schools of Visakhapatnam district. Random technique was used for sampling. The study was descriptive in nature. Data Collection was done with the help of Standard Progressive Matrices (SPM) by Raven (1941) and Creativity scale developed by investigator. Mean, standard deviation, coefficient of correlation and regression equation techniques were used for data analysis.

The findings of study were: (1) There is a significant positive relationship between intelligence and achievement in mathematics. (2) There is a significant positive correlation between creativity and achievement in mathematics. (3) There exists a significant positive relationship between intelligence and creativity. (4) There is a significant difference between boys and girls with regard to intelligence. (5) There is no significant difference between the students studying in urban and rural schools with regard to intelligence. (6) It is observed that private school students differ significantly from those of government schools with regard to intelligence. (7) Students studying in English medium schools do not differ significantly from those studying in Telugu medium schools with regard to intelligence. (8) There is a significant positive
relationship between boys and girls with regard to creativity. (9) A significant positive correlation is observed between the students studying in rural and urban schools with regard to creativity. (10) There exists a significant positive relationship between the students of government and private schools with regard to creativity. (11) The students studying in the English medium schools differ significantly from those studying in Telugu medium schools with regard to creativity. (12) There is a significant difference between boys and girls in the achievement of mathematics. (13) There is a significant difference between the students studying in rural and urban schools with regard to their achievement in mathematics. (14) There is a significant difference between the students studying in government and private schools with regard to their achievement in mathematics. (15) The students studying in the English medium schools differ significantly from those studying in Telugu medium schools with regard to their achievement in mathematics.

Study – 6


Title : A Comparative Study of the Impact of General Intelligence, Level of Aspiration and Awareness of Facilities on the Academic Achievement of Scheduled Caste Students.

The objectives of the study were: (1) To study the general intelligence, level of aspiration and awareness of facilities on the academic achievement of male and female schedule caste students of the senior secondary stage. (2) To study the general intelligence, level of aspiration and awareness of facilities on the academic achievement of rural and urban male and urban male schedule caste students of the senior secondary stage.

A sample consisted of 500 Scheduled Caste students studying in 28 Senior Secondary Schools of Rohtak District. The tools used were: General Intelligence Test developed by R.K. Ojha and Dr. Ray Chaudhary; Level of Aspiration developed by V.P. Sharma and Anuradha Gupta; Awareness facilities Questionnaire developed by investigator; and Achievement scores of X class.

The findings of the study were: (1) The general intelligence of male scheduled caste students has been found better than the female scheduled caste students of the senior secondary stage. (2) The general intelligence of rural male scheduled caste students has been found better than the urban male scheduled caste students of the senior
The general intelligence of female urban scheduled caste students has been found better than the rural female scheduled caste students of the senior secondary stage. (4) The level of intelligence of the female urban scheduled caste students has been found better than the rural female scheduled caste. (5) The level of intelligence of the urban male scheduled caste students has been found better than the rural male scheduled caste. (6) There is no significant difference between the level of aspiration rural and urban female at the senior secondary stage. (7) The male scheduled caste students are more aware of the facilities available to them than the female scheduled caste students at the senior secondary stage. (8) Rural male students have been found more aware of the facilities in comparison to urban males scheduled caste students at the senior secondary stage.

**Study – 7**


**Title** : *Cognitive Process, Hemisphericity and Personality of Teacher Trainees of B.Ed. Course.*

The objectives were: (1) To study the cognitive process of teacher trainees of B.Ed. course; (2) to find out the correlation, if any, between cognitive process and sex, locality, management and type of college of teacher trainees; (3) to find out the correlation, if any, between cognitive process and hemisphericity and personality of the teacher trainees; (4) to find out the interaction, effects, if any, of sex and locality, sex and subject and sex and management on cognitive process of teacher trainees.

Descriptive normative survey method and quantitative approach was adopted for the study. A sample of 654 teacher trainees of B.Ed. using probability sampling method was taken. The tools used in the study were the cognitive process test, SOLAT test and Scale of Introversion–Extroversion.

The findings were: (1) There was significant relationship between the cognitive process and sex, locality and management. The women teacher trainees are at a higher level than the men teacher trainees; the urban teacher trainees are at a higher level than the rural teacher trainees; the teacher trainees studying in the government colleges of education are at a higher level than the teacher trainees studying in the private colleges of education in their cognitive processes. (2) There was significant relationship between cognitive process and hemisphere dominance. The right hemisphere dominant teacher
trainees are at a higher level than the left hemisphere dominant teacher trainees in their cognitive process. (3) There was significant relationship between cognitive process and personality types. The extrovert teacher trainees are at a higher level than the ambivert teacher trainees in their cognitive process. (4) There was no interaction of sex and locality, sex and subject of specialisation and sex and management of the colleges of education on cognitive process of the teacher trainees.

**Study – 8**


**Title** : *Relationship of Academic Achievement of Middle School Students with their Intelligence, Adjustment and Achievement Motivation.*

The objectives of study were: (1) To find out the significance of difference between intelligence, achievement motivation, adjustment and academic achievement of students. (2) To find out the significance of correlation between intelligence, achievement motivation, adjustment and academic achievement of students. (3) To find out the significance of difference between intelligence, achievement motivation, adjustment and academic achievement of students on the basis of gender. (4) To find out the significance of difference between intelligence, academic motivation, adjustment and academic achievement of students on the basis of arts and science. (5) To know the effect of achievement motivation and adjustment on academic achievement of students when intelligence is considered as covariate. (6) To know the effect of adjustment and achievement motivation on academic achievement of students by considering these variables as covariates separately.

The research was Descriptive Survey in nature. 600 Students of Arts and Science from Intermediate Schools of Firozabad selected as a sample by Random Sampling Method. Group Intelligence Test by S.S. Jalota, Adjustment Inventory by A.K.P. Sinha and R.P. Singh, Achievement Motivation Test by V.P. Bhargav and High School’s Marks as Academic Achievement were used for data collection. The data were analyzed with the help of Critical Ratio, Correlation, Partial Correlation and Analysis of Covariance.

The findings of study were: (1) The mean critical ratio of science and students, science and arts, science and female students, arts and female students and arts and male students was significant. (2) The critical ratio of Intelligence of male and female students
was significant. (3) The mean of science students was higher than that of arts students. (4) The mean critical ratio of adjustment of all the groups was not significant. Only mean critical ratio of arts and male students was significant. (5) The critical ratio of achievement motivation of science and students and male and female students was not significant. (6) The critical ratio of achievement motivation of science and arts, science and arts students, arts and students & arts and female students was significant. (7) The critical ratio of academic achievement of all the groups was significant. Only critical ratio of male and female students was not significant at any level. (8) The F-value of intelligence, achievement motivation and academic achievement was significant. (9) The F-value for adjustment was not significant at any of the level. (10) The 24 correlation between four variables of all the groups were studied. Out of which 16 correlations were significant. Eight were negative. Out of these eight, 6 correlations were significant and 2 were not significant. (11) The correlation between academic achievement and adjustment, academic achievement and intelligence, achievement motivation and intelligence & adjustment and intelligence of all the groups was positive and significant. (12) There was negative correlation between achievement motivation and adjustment of all the groups and this was significant. (13) There was a negative correlation between academic achievement and academic motivation of arts students and female students. The negative correlation was significant. (14) There was a negative correlation between academic achievement and achievement motivation of science students and female students. But this correlation was not significant. (15) When partial correlation was calculated, it was found that, in case of nullifying some variable other variable have positive correlation. (16) The critical ratio of mean of achievement motivation, adjustment and academic motivation of male and female students was not significant. The critical ratio of mean of intelligence was significant. There was no significant difference between achievement motivation, adjustment and academic achievement of male and female students. The difference was only in intelligence. (17) There was a significant difference between intelligence, achievement motivation and academic achievement of arts and science students. There was no difference in adjustment of arts and science students. (18) When intelligence was considered as covariate the effect of achievement motivation on academic achievement of all the groups was significant. (19) When intelligence was considered as covariate the effect of adjustment on academic achievement of students of upper and lower group students was significant. But the effect of adjustment on academic achievement of upper and general group students was
not significant. (20) When achievement motivation was considered as covariate the influence of adjustment and intelligence on academic achievement of upper and lower & upper and general group students was significant. But the influence of adjustment and intelligence on academic achievement of general and lower group students was not significant. (21) When adjustment was considered as covariate the influence of achievement motivation on academic achievement of three groups was significant. But the influence of intelligence on academic achievement of upper and lower & upper and general group was significant. There was no influence of intelligence on academic achievement of general and lower group male and female students. (22) The effect of other variables on academic achievement was only 36% when partial was calculated.

**Study – 9**


**Title**  :  *Influence of Cognitive Style, Intelligence and Classroom Climate on Process Outcomes in Science.*

The aim of this study was to find out the effect of cognitive style, intelligence and classroom climate on process outcomes in science.

The sample size was taken 1,000 persons and selected through proportionate stratified sampling technique and considering other factors like sex, locality of students and management category of schools. For data collection the tools used were the following: (1) Group Embedded Figures Test (GEFT) by Otlman, et al, 1971, (2) Standard Progressive Matrices Test (SPMT) by Raven, 1958, (3) Scale of Classroom Climate by Usha and Aruna, 1999), (4) Test of process Outcomes in science by (Usha and Aruna, 1999). The statistical techniques used in this study were means, Pearson’s product moment coefficient of correlation and three-way ANOVA with $3 \times 3 \times 3$ Factorial Design.

The cognitive style and intelligence have significant positive correlation with process outcomes in science, while the classroom climate has no significant effect on process outcomes in science.
Study – 10

Investigator : Shruti Mishra and Shraddha Shukla (2007)

Title : Interaction Effect of Adjustment and Need Achievement Upon Creativity.

The objective of this study was to analyse the interaction effect of adjustment and need achievement upon creativity.

The population of present study constituted of college going students of district Jalaun of Uttar Pradesh. Total 400 units of the students were selected in which 200 hundreds were male and 200 hundreds were female students. Sample of the study was selected by combination of non-probability and probability techniques through quota sample (stratified cluster sampling) and systematic random techniques. The tools of the study were: Standardized Tests were of Creativity, Adjustment and Need-Achievement and Creativity test by Dr. N.S. Chauchan and Dr. Govind Tiwari; Taresh Bhatias’s Adjustment Inventory; and Deo-Mohan Projective Test or Achievement Motivation. The statistical operation followed for the investigation involved descriptive and inferential technique. Computation of mean, S.D., ‘t’ test and ANOVA (2x2 factorial design) found out significant mean difference among the sub-groups. Quartiles were computed for getting 25% of highest and lowest 25% cases on adjustment, need-achievement and creativity. For the purpose of interpretation factorial technique 2x2 was adopted.

It was found that both high pupils (adjustment and need-achievement) had high level of creativity. It can be stated that high pupils have high level of creativity. To find out the interaction effect of need-achievement and adjustment on total creative power, 2x2 factorial design was used and analysis of variance was calculated. It was found that need-achievement affected creativity as a whole has effect on need-achievement. Adjustment has also effect upon creativity. Total need-achievement and adjustment had no interaction effect upon creativity.

Study – 11

Investigator : Khan, Neelofar (2008)

Title : Impact of Creative Talent on the Performance of Teachers Trainees of Distance Mode.

The objectives were: (i) The main objective of the study was to find out the impact of training on the creativity of the teacher trainees being trained through the
distance mode; (ii) the other objective of the study was to analyse the differences in the achievement motivation among high, moderate and low creative groups of B.Ed. teacher trainees of the distance mode.

The survey method was adopted to ascertain about the degree of creativity in the form of fluency, flexibility and originality being possessed by the teacher trainees and as such to know the impact of total creative ability on the N-achievement of the trainees being trained through the distance mode. The sample consisted of randomly selected 150 teacher trainees enrolled with the Centre of Distance Education (CDE), University of Kashmir.

The findings were: (1) The results gathered here show that the creative teacher tries to perform well in relation to a standard of excellence or in comparison with others who are competitors and their achievement also suggest a high level curiosity. (2) The results also reveal that the teacher with strong need for achievement wants to be successful at some challenging task, only for the sake of doing well.

2.4. RELATED FOREIGN STUDIES

Study – 1

Investigator : Noble, Kimberly G. (2005)

Title : Socioeconomic Status Modulates Cognition-Achievement and Brain-Behavior Relationships.

Socioeconomic status (SES) is associated with cognitive ability and achievement during childhood and beyond. However, little is known about the developmental relationships between SES and specific brain systems or their associated cognitive functions. Through the assessment of neurocognitive functioning in two separate cohorts of children from varied socioeconomic backgrounds, it was found that tasks that rely heavily on language processing skills are more highly correlated with SES than are tasks, which tap other neurocognitive systems. Because of the exceptional importance of reading skill for academic and life achievement, the means by which SES influences that particular aspect of language development merited particular attention. It was found that SES can modulate cognition-achievement relationships in reading, such that phonological awareness (PA) is more highly associated with decoding among lower SES children, suggesting that greater access to resources may buffer reading skills among children with weaker PA. These results also suggest the possibility that a child who
struggles with reading in the context of a lower SES environment might have difficulties that are fundamentally different from those of a child who struggles despite the access to resources typically associated with a higher SES environment. To investigate this possibility, neural activity associated with reading was examined across SES using functional magnetic resonance imaging (fMRI). Results demonstrated that lower SES children demonstrating a range of below-average PA exhibit the typically reported brain-behavior relationships, with higher PA associated with reading-related activity in left occipito-temporal and left perisylvian regions. In contrast, higher SES children with similar low skill levels show atypical brain-behavior relationships in these regions. Furthermore, higher SES children show positive correlations between PA and brain activity in putative compensatory regions, whereas lower SES children do not. It is thus concluded that socioeconomic background has the potential to modulate brain-behavior relationships in reading.

Study – 2

Investigator : Bernstein, Dorrie (2006)

Title : The Impact of Implicit Theories of Intelligence on the Motivation of Students with Learning Challenges.

There is limited research on the motivational style of middle school and high school students with learning disabilities, language impairments, and attentional problems. The present study explored the motivational processes of 7th through 11th graders receiving support services through special education. A well-researched theoretical model of motivation was employed in order to facilitate understanding of the underpinnings of achievement motivation among individuals in this special population. Specifically, Dweck's motivational process model was applied including implicit theories of intelligence and achievement goal orientation as predictors of individual response to failure. Following the administration of a failure scenario, behavioral and cognitive responses to failure were measured. Participants in 3 suburban public school districts completed a questionnaire measuring implicit theories of intelligence and achievement goal orientation (i.e., learning, performance-approach, and performance-avoidance). In addition, the students read a failure scenario and then completed questions about their attributions for failure and positive strategy use following failure. Findings revealed that an incremental theory of intelligence and a learning goal orientation were predictive of a
mastery-oriented response to failure as seen in use of positive strategies and mastery-oriented attributions. The predictive power was stronger for positive strategy use when the effects of age were accounted for. Younger students used more positive strategies. Performance-approach and performance-avoidance goals did not have any relationship to other variables. Thus, belief in the malleability of intelligence when combined with a learning goal, tended to insulate adolescents with learning challenges from the effects of a learned helpless response to failure. The results of the study are viewed through the lens of existing theory and further areas of research are recommended.

**Study – 3**

**Investigator** : DeRuyck, Kimberly A. (2006)

**Title** : *Relationships of Intelligence, Academic Achievement, and Emotional Symptoms with Debilitating and Facilitating Test Anxiety among Elementary School Students.*

This study investigated the joint contributions of emotional, academic, and cognitive variables on test anxiety levels utilizing a multimethod approach. Test anxiety is associated with diminished cognitive, academic, social, and emotional functioning and has pervasive effects among students. Empirical research has not yet evaluated factors that collectively predict debilitating and facilitating test anxiety levels, though an abundance of empirical literature supports the associations between test anxiety and an array of variables. Hierarchical regression analyses examined emotional stability, intelligence, academic skills, gender, and socio-economic status as predictors of test anxiety levels. Participants consisted of 116 fourth grade students (55% female) from four schools across the Midwest. Instruments utilized to conduct the regression analyses included an emotional stability scale from a broad measure of behavior and personality, the Behavior Assessment System for Children - 2, Self-Report Child Form (BASC-2; Reynolds and Kamphaus, 2004); a screening measure of intellectual functioning, the Reynolds Intellectual Screening Test (RIST; Reynolds and Kamphaus, 2003); and results from school-based measures of academic skills. After controlling for the effects of socio-economic status and gender, these variables collectively accounted for 34% of the variance in the Test Anxiety Inventory for Children and Adolescents (TAICA; Lee, Lowe, and DeRuyck, 2004) debilitating test anxiety score (p < 0.001). Specifically, students who reported fewer symptoms of internalizing disorders and who performed better on measures of academic and cognitive functioning were likely to experience less
debilitating test anxiety than those students with more symptoms of internalizing disorders and poorer academic and cognitive functioning. Additionally, the emotional stability variable uniquely contributed to the prediction of debilitating test anxiety. These same variables did not significantly predict facilitating test anxiety. Results suggest that emotional, academic, and cognitive variables jointly predicted test anxiety that impedes performance and emotional stability also uniquely predicted debilitating test anxiety. Parents, educators, and mental health professionals could promote emotional stability and target the amalgam of variables associated with test anxiety through prevention and intervention programs. School psychologists are well qualified to tackle this concern considering their unique training and positions of leadership within school systems. Implications, study limitations, and future research directions are discussed.

**Study – 4**

**Investigator** : Chiles, Deborah (2006)

**Title** : Examining the Relationship between Parental Education and Nonverbal Intelligence in 4 to 10-year-olds Using the Leiter International Performance Scale-Revised Brief IQ Scale.

The purpose of this study was to evaluate the degree to which parental education level correlates with nonverbal intelligence. Nonverbal intelligence was measured using the Leiter International Performance Scale-Revised (Leiter-R) Brief IQ Screener. The sample included 26 male and female minority children, aged 4 to 10-year-olds. It was predicted the correlation between nonverbal intelligence and parental education would not correlate as highly with the Leiter-R Brief IQ score as the other variable factored into the analysis. The other variable, parental expectations for their child's educational attainment, was expected to have a stronger correlation with nonverbal intelligence. An additional variable, a child's self-perception of his/her ability to learn, was initially intended to be a third independent variable, but due to the lack of variance in responses among participants and poor reliability of the child to report his/her learning ability, it was dropped from the analysis. While parental education level was significantly correlated with nonverbal intelligence scores, its correlation was not as high as the correlation between parental education and nonverbal IQ. As predicted, parental expectations for their child's educational attainment had the highest correlation with the Leiter-R Brief IQ score. A significant correlation was also found between parental education level and parent's expectations for their child's educational attainment. When
analysis was done by gender, a more significant relationship was found between parental expectations and nonverbal IQ versus parental education with male subjects. Additionally, the correlation for males between parental expectations and Brief IQ score was 22 points higher than it was for females. The relationship between parental education and nonverbal IQ was more significant with the female subjects.

Study – 5

Investigator : Duckworth, Angela Lee (2006)

Title : Intelligence is Not Enough: Non-IQ Predictors of Achievement.

The importance of intelligence to achievement in all professional domains is well-established, but less is known about other individual differences that predict success. The current investigation documents the contribution of two non-IQ traits, self-discipline and grit, to achievement. Chapter 1 summarizes two longitudinal studies in which self-discipline, measured using a multimethod, multisource approach, predicted the academic performance of adolescents several months later. In the second of these studies, self-discipline explained more than twice the variance in academic performance as did IQ, to which self-discipline was not strongly related. Chapter 2 explores gender differences in self-discipline and the relative contribution of this advantage to various measures of academic performance. In two longitudinal studies involving the same cohorts studied in Chapter 1, girls were more self-disciplined than boys. The female advantage in self-discipline contributed to higher grades in all courses including mathematics, despite only marginally superior achievement test scores and lower IQ scores. In Chapter 3, I introduce a related but different trait: grit. Defined as perseverance and passion for long-term goals, grit was hypothesized to predict success over and beyond self-discipline and IQ in especially challenging settings. Five studies are presented in support of this hypothesis. Specifically, grit predicted educational attainment among a larger sample of adults aged 25 or older, GPA among high-achieving adolescents and undergraduates, retention and GPA at the United States Military Academy (West Point), and final ranking in the National Spelling Bee. In the latter four studies, grit provided incremental predictive validity over and beyond that of IQ. Grit was a better predictor than self-discipline of retention at West Point and performance in the Spelling Bee, but in three studies, self-discipline was a better predictor of GPA. I speculate that grit is more important to the accomplishment of especially challenging
goals in which the temptation to give up altogether is great, whereas self-discipline is more important to the accomplishment of more moderate, highly structured tasks.

Study – 6

Investigator : Thompson, Pamela Bridget (2006)

Title : Performance Creativity: The Role of Self, Meaning and Cultural Significance in a Montessori Environment.

The purpose of this study was to describe and interpret the dimensions of performance creativity within a Montessori culture. Performance creativity is a re-conceptualization of how creative activity is recognized and encompasses four elements: self, self-expression, meaning, and cultural significance. The conceptual framework for this study articulates creativity as a dynamic self-construction influenced by the meaning one draws from a cultural learning environment. The reconceptualization of creativity is built upon a frame of neuroscience research, Montessori philosophy, and selected Eastern/Asian, African and Native American views of creativity. This qualitative study was conducted in a Montessori primary and elementary school in the western United States, and it employed both the traditional ethnographic techniques of extended observations and artifact analysis. The study also used the performance ethnographic method of the collaborative dialogic interview. The goal of performance ethnography is to produce a research based performance narrative which views research participants as collaborators in the composition of the performance script. One of the facets of a performative study is that it initiates a dialogue within a larger community. The goal for this study is that it will invite educators to begin to re-examine how and why children express creativity and how creativity can be envisioned through a multicultural lens. The findings of this work present emerging connections among neurological, Montessori and multicultural perspectives of creativity that were observed in a Montessori learning environment. Educational implications related to this study include the potential for the fields of neuroscience and education to be drawn closer together, by using a multicultural avenue through which to describe creativity. The goal of designing curriculum and teacher education that is supported by neurological evidence is one that can be supported by further research in this area.
Older adults frequently show a variety of changes in thinking, including increased distractibility, self-reported memory problems and an inability to inhibit task-irrelevant thoughts. It has been suggested that deficits in a variety of functions related to the initiation and control of behavior underlies these common markers of cognitive aging. In a review of brain changes in aging, Cabeza (2002) presented evidence that older adults have reduced hemispheric asymmetry when compared with younger adults. The current study addressed this premise directly by utilizing a lateralized lexical decision task to assess hemispheric asymmetrical semantic priming in an older population. We hypothesized that the contribution of the right hemisphere in cognitive functioning increases with age. The aim of this study was to demonstrate that older adults show a greater involvement of the right hemisphere in language processing compared to younger adults. According to previous research increased reliance on right hemisphere processing in older adults (the 'resource recruitment' hypothesis) would result in less effective separation of the special contributions of the two hemispheres. Eight-three participants participated in the current study (n=42 young, mean age 21.21, n=41 old, mean age 75.61) where they were required to complete a lexical decision task to assess semantic priming. A multi-factorial ANOVA examined age differences in reaction time, accuracy and priming. The current study provides support for Cabeza's (2002) Hemispheric Asymmetry Reduction in Older Adults (HAROLD) model. Older adults showed a greater utilization of both hemispheres during the priming task and were at a disadvantage when both prime and target are presented to the same hemisphere. This is the case when looking at reaction time, accuracy and priming data. Several limitations of the current study as well as future directions for research are discussed.
Study – 8

Investigator : Fassbinder, Wiltrud (2006)

Title : Hemispheric Differences in Effects of Meaning Similarity and Meaning Dominance on Semantic Priming: A Divided Visual Field Study.

Based predominantly on semantic priming studies with divided visual field (DVF) presentation, current models of hemispheric differences in word semantic processing converge on a proposal that left hemisphere (LH) processes focus word meanings to their core by inhibiting less related meanings, whereas right hemisphere (RH) processes keep less related meanings active. The inhibition process supported by LH processing is assumed to apply to two distinct semantic processes: (a) narrowing of a single word meaning (inhibition of less related features and words), and (b) elimination of incompatible/conflicting meanings of an ambiguous word. Semantic priming studies investigating hemispheric differences in these two processes have relied on associated prime-target pairs, which might have been problematic for two reasons. First, association might reflect lexical co-occurrence of word forms rather than effects of semantic relatedness; therefore, these studies might have confounded lexical and semantic priming effects. Second, in studies of ambiguous words dominant items were strongly associated whereas subordinate items were weakly associated; therefore, these studies confused dominance and degree of relatedness. To address these confounds, this study conducted two semantic priming experiments with central prime presentation, DVF presentations for targets, and a 750 ms SOA. Experiment 1 investigated the effect of degree of semantic similarity on priming, using non-associated, prime-target pairs that were controlled for lexical co-occurrence. Experiment 2 investigated effects of meaning dominance on priming with non-associated prime-target pairs. Results are consistent with high-similarity priming for left visual field (lvf) and possibly for right visual field (rvf) targets, and with high-dominance priming for rvf and lvf targets, suggesting that LH (and RH) processes mediate effects of semantic similarity and dominance. However, priming effects in both experiments were very small. Thus, priming effects might have reflected that prime-target relatedness was less than expected, indicating that LH processing does not inhibit less related meanings, which is consistent with other studies using central primes. Additionally/alternatively, larger priming effects in other studies might derive mainly from association rather than semantic similarity. Finally, the small
priming effects could be due to some aspect of the experimental procedure that might have made these experiments less sensitive to semantic priming.

**Study – 9**

**Investigator** : Tan, Ai-Girl; Ho, Valerie; and Yong, Lim-Chyi (2007)

**Title** : Singapore High School Students’ Creativity Efficacy.

Singapore education adopted nurturing creativity and developing creativity efficacy among their students and children. This study investigated Singapore high school students' creativity efficacy based on the contemporary model of creativity (Amabile, 1983, 1996), self efficacy (Bandura, 1989, 1997) and inclusion education.

Creativity efficacy of high school students was measured. Five scales were developed with reference to the context of learning of the participants: creativity self-efficacy (cognitive style), creativity self-efficacy (working style and personality trait), domain-specific efficacy with reference to everyday problem solving, civic responsibility and intercultural relationship.

The participants were 510 high school students (46.5%, girls). The age range of the students was between 12 and 18 years old (M = 15.43 years old and SD = 0.87 years old). Method: The questionnaire survey was distributed to the participants who rated their responses on a five point Likert scale with anchors "1" "very much unlike me", "2" "unlike me", "3" "moderately like me", "4" "like me" and "5" "very much like me". Alpha reliabilities of all the scales were high, between 0.7 and 0.9, indicating the presence of internal consistency.

Significant correlations were observed among creativity self-efficacy (working style and personality trait), creativity self-efficacy (cognitive style), and everyday problem solving efficacy. Exploratory factor analysis on the scales yielded one factor, creativity efficacy, accounted for 54.1% of variance. Confirmatory factor analysis was performed to all subscales resulted in one factor model, with high fit indexes (0.98) and Cronbach's alpha (0.76). Conclusion: Singaporean high school students' scored moderately high for creativity efficacy, 80.5 (the lowest being 33, and the highest, 115). No significant gender difference was observed. Implications of the results of the study were discussed with reference to developing efficacies in the context of creativity education in Asian and Chinese societies.
Study – 10


Title : The Scientifically Substantiated Art of Teaching: A Study in the Development of Standards in the New Academic Field of Neuroeducation (Mind, Brain, and Education Science).

Concepts from neuroeducation, commonly referred in the popular press as "brain-based learning," have been applied indiscriminately and inconsistently to classroom teaching practices for many years. While standards exist in neurology, psychology and pedagogy, there are no agreed upon standards in their intersection, neuroeducation, and a formal bridge linking the fields is missing. This study used grounded theory development to determine the parameters of the emerging neuroeducational field based on a meta-analysis of the literature over the past 30 years, which included over 2,200 documents. This research results in a new model for neuroeducation. The design of the new model was followed by a Delphi survey of 20 international experts from six different countries that further refined the model contents over several months of reflection. Finally, the revised model was compared to existing information sources, including popular press, peer review journals, academic publications, teacher training textbooks and the Internet, to determine to what extent standards in neuroeducation are met in the current literature.

This study determined that standards in the emerging field, now labeled Mind, Brain, and Education: The Science of Teaching and Learning after the Delphi rounds, are the union of standards in the parent fields of neuroscience, psychology, and education. Additionally, the Delphi expert panel agreed upon the goals of the new discipline, its history, the thought leaders, and a model for judging quality information. The study culminated in a new model of the academic discipline of Mind, Brain, and Education science, which explains the tenets, principles and instructional guidelines supported by the meta-analysis of the literature and the Delphi response.
Study – 11

**Investigator**: Subotnik, Rena F.; Edmiston, Ashley M.; Cook, Lucas; and Ross, Michael D. (2010)

**Title**: Mentoring for Talent Development, Creativity, Social Skills, and Insider Knowledge: The APA Catalyst Program.

The mentoring component of the American Psychological Association Catalyst Program, and the Pinnacle Model upon which it was built, was derived from Bloom's (1985) model of talent development. According to Bloom and his associates, optimal instruction for talent development takes place in three stages. During the first stage, young people are guided to fall in love with a topic, idea, or discipline. The second stage involves instruction in the skills, knowledge, and values of the domain. In the third and final stage, the talented young person learns to apply his or her passion and technical mastery to create a unique style and message, and to explore original problems. The Catalyst Program is a year-long program designed to support the transition from the second to the third stage of Bloom's talent development model though instruction by renowned masters in science and the arts and places a premium on the mentor/scholar relationship in guiding participating adolescents in their scientific interests and career aspirations. For the Catalyst Scholars, connecting to their team Master was the thread through which the Scholars integrated their experience with chemistry, creativity, and insider knowledge. Catalyst participants came to the program having already "used up" any resources they had available to them in their school or in other out-of-school programs, and sought more intense involvement with a career path they had tentatively committed themselves to. In the course of the experience, they refined their goals, learned what it takes to be successful, and made powerful and lasting friendships and contacts that should prepare them optimally to be future innovators.

Study – 12

**Investigator**: Bettina Neininger & Friedemann Pulvermüller (2010)

**Title**: The Right Hemisphere’s Role in Action Word Processing: a Double Case Study.

Word category-specific deficits were investigated in two patients with right hemispheric lesions and hemiparesis affecting the left extremities. Words from three categories, action verbs, nouns with strong visual associations and nouns with both
strong action and visual associations, were presented in a lexical decision task. The stimulus categories were matched for word length and frequency. In both patients, responses to action verbs were slowed and/or less accurate compared with the other word categories. This was so even in the patient with a minor lesion in the motor, pre-motor and somatosensory areas of the hand representation. Control subjects did not show category differences when tested with the same stimulus materials. These results are consistent with the view that the cortical areas involved in the programming of body movements, even those in the hemisphere not dominant for language, specifically contribute to and are necessary for the processing of words referring to such movements. As an alternative, the affected brain areas may be of particular relevance for the processing of words from the lexical category of verbs. The results are consistent with a brain model of language based on Hebb’s cell assembly concept.

Study – 13

Investigator : Shaheen, Robina (2011)

Title : The Place of Creativity in Pakistani Primary Education System: An Investigation into the Factors Enhancing and Inhibiting Primary School Children's Creativity.

The study presented in this book provides a baseline analysis of the extent to which the primary education system in Pakistan is capable of enhancing or inhibiting children's creativity. It involved 1008 primary schools who participated in a survey, 154 children who took the Torrance Tests of Creative Thinking, and classroom observation in 16 schools as well as documentary an analysis of the education policy documents, curriculum and the official science textbook. The research presents the findings related to the definition of "creativity," and the means used to identify, assess and enhance it as well as the importance and the obstacles faced in doing so. The study finds that while policy documents mention the introduction of creativity in education, and the curriculum lays emphasis on the concept in a comprehensive manner, the designated textbooks and teaching practices do little more than encourage rote memorization and regurgitation of information. The measurement of children's creativity in this study has shown that children have the ability to produce ideas which are at times also original. But they appear to be weaker in other areas such as being able to produce abstract titles, and remaining open to going beyond the "ordinary" in their thinking. This is due to the fact that much of the teaching is only geared towards knowledge acquisition. This research
has reinforced the need for a systems view of creativity, in order to provide a more holistic and less distorted view of the phenomenon. Appended are: (1) Questionnaire (Urdu and English versions); (2) Training material for the survey; (3) Torrance Tests of Creative Thinking (English and Urdu versions); and (4) Classroom Creativity Observation Schedule.

**Study – 14**

**Investigator** : Ahmad Mohamed Al Ghraibeh (2012)

**Title** : Brain Based Learning and Its Relation with Multiple Intelligences.

This study aims at exploring the learning that is attributed to the brain and its relationship with multiple intelligences. In order to achieve the goals of the study, two examinations are used. The First one is the examination of the thinking and learning method that is based on both hemispheres of the brain. The second one is the examination of the multiple intelligences. Some referees are consulted for assuring the suitability of the examinations for the measured sample and the calculation of the exam. The sample consists of 300 students who study the course of psychology. The sample is chosen randomly. The results indicates that more repeated method of learning and thinking is based on the left hemisphere of the brain; as it comes out with the highest total of 136 and within a percentage of (45.3%). In addition, the results that are related to the dominance of the multiple intelligences indicate that personal intelligence, and physical intelligence are the highest respectively; a mean value of (49.80%). Whereas, intrapersonal intelligence comes third with a mean value of (48, 40%). Finally, musical intelligence scores the lowest mean value.

Regarding connection relation; it is as a statistical function on the level of the (P=0.05) between the natural intelligence and the left hemisphere of the brain on one hand; and the intrapersonal and the integrated intelligence on the other on the other hand.

The study also shows that there is an equal relation with a function at the statistical function of (P=0.01) between the musical intelligence with the right hemisphere and the logical intelligence with the left hemisphere. It is also clear that there is an equal relation between both of (the bodily and the linguistic intelligences) with the left hemisphere and the spatial intelligence with the right hemisphere.
2.5. CRITICAL REVIEW

Majority of the studies focused on analysing the Hemispheric Language Dominance, Children's Creativity, Creativity Training, Problem Solving Skills, Semantic Processing, Disruptive Behaviors, Self-Image, Hemispheric Differences in Numerical Cognition, Drawing Ability, and Visual/Spatial Intelligence, Intelligence, Cognitive Style, General Intelligence, Aspiration, Personality, Classroom Climate, Test Anxiety, etc. Survey method and experimental method was adopted in most the studies reviewed. Tools like Stimulus Onset Asynchronies, Creative Personality Scale, Raven’s Standard Progressive Matrices etc., were used. Most of the studies adopted cluster and random sampling method. MANOVA, Cluster Analysis, Three-way ANOVA, Scheffe Test, ANOVA, Chi-square, Regression Analysis etc., were used for data analysis.

The review of related literature of both Indian and foreign studies has revealed the fact that none of the researchers has studied the influence of hemisphericity on creative thinking, intelligence and academic achievement of high school students. Hence, the investigator intends to take up this study.
2.6. REFERENCES