"TEACHER EFFECTIVENESS AND STUDENT ACADEMIC ACHIEVEMENTS"

A

DISSERTATION

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INDIRA GANDHI NATIONAL OPEN UNIVERSITY

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CERTIFICATE OF ORIGINALITY

This is to certify that **Mr. .....** a student of M.A. Education has completed his dissertation entitled **"Teacher Effectiveness and Student Academic Achievements"** under my supervision, and guidance. The whole work is genuine an original. I consider it worth of presentation to the Indira Gandhi national Open University for partial fulfillment of the requirement of the award of the degree of Master of Arts (Education). I find the dissertation completed and fit for submission.

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Words often fail to express one's inner feeling of indebtness to one's benefactor. But the only media at the disposal of the investigator at present is his heart felt gratitude to all those who rendered help in accomplishing this difficult task.

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INTRODUCTION

INTRODUCTION

Education is a lifelong process and it starts from the day a child is conceived and ends with the death of an individual. It is a process through which human personality develops. In the society an individual acquires education through formal, informal and non-formal ways. What happens to us in life depends on not just ‘how we’ think, but ‘how well’ we think and learn. Of all the factors that influences an individual; his styles of learning and thinking play a major role. One child may perform tasks in an orderly and systematic pattern and another may perform tasks in an unsystematic pattern. This is due to individual differences in their style of learning and thinking. Emotional Intelligence is increasingly relevant to organizational development and developing people, because the EQ principles provide a new way to understand and assess people’s behaviors, management styles, attitudes, interpersonal skills, and potential. Emotional Intelligence is an important consideration in human resources planning; job profiling, recruitment interviewing and selection, management development, customer relations and customer service, and more.

God has created man in his own image so among all the creatures only man has creative abilities power of thinking logically and reacting emotionally. He has crafted human mind authentically in a unique way, which is able to solve problems and think divergently. The ideology of learning styles was adopted to incorporate multiple ways people respond, think, hear, touch, rationalize and formulate knowledge or learning (Dunn & Dunn, 1993).Learning styles have attained vital importance in our society. During the past decade, educational research has identified a number of factors that account for some of the differences in how students learn. One of these factors, learning styles, is broadly described as “Cognitive affective and

psychological friars that relatively stable indications of how learners perceive, interact with and respond to the learning environment" (Keefe, 1979).There are evidence from research in the field (Benson, 2005,Bloom, 1956, Dunn & Dunn, 1993, Gregore, 1982, Jung, 1971,Kolb, 1985, Leavitt, 2004, Lindsay, 2006 Smith, 2006).Learners' needs and various strategies and techniques are involved in classroom instruction to enhance learning and thinking styles of the learners. Once an individual's learning styles has been identified, there is a greater appreciation, deeper insight and better understanding of numerous ways individuals learn. Nurturing individuals styles of learning and employing certain methods and learning techniques, equips learner with tools to act effectively in the school environment and satisfies intellectual and emotional needs (Honigs feld &Dunn, 2006).

The intellectual capabilities which separates the humans from all other animals, developed slowly over the entire four million years or more of the human development. The intellect is not in unique human-beings only; it is quite well developed in a number of other higher animals. The intellect developed as a control over instincts and behavior of man. Self-discipline, therefore, is the measuring stick of the human. The more disciplined behavior (behavior determined by intellect) displayed by the individual, the more human he becomes. The less disciplined behavior (behavior in response to instinct) displayed by an individual, the more he becomes like the lower order animals that are lacking in intellect and are driven by their instincts. Education plays vital role in developing self-discipline and shaping the behavior of human beings.

Nobel Laureate Amaryta Sen argued persuasively that human development is best defined as the expansion of individual freedoms or capabilities. Education as an essential activity in the development of society has seen

major transformations, from which the new methods and models of the modern educational system have resulted. The relationship between the individual and society becomes more complex via education, as the individual gains the capability to make his contribution that would balance the benefits of his living among other individuals. In this context, education represents the basis of a society oriented towards the future, knowledge becomes the main component of the economic and social growth, and the economic crisis becomes an impediment in the development of the knowledge-based society. Therefore, the development of the knowledge based society is dependent on the creation of knowledge, on its spreading via education on its dissemination via communication and on its involvement in technological innovation and cognitive ability.

In the recent years the push to use technology in the classroom has increased, be it because of changing global needs or due to pressure by the government based on teaching-learning process. Moreover, technology appeals to young learners and aids their comprehension and retention of new information. But this technological method of teaching is not enough in the process of academic achievement. It is actually important for the teachers to know the need of the student and to focus their attention on student's favored thinking styles before imparting the subject matter. If they fail to do so, the learning situation may be serious, because the teachers may tend to confuse the styles of students mind. Since the method of teaching adopted by the teacher often depend on their personal thinking style, the students who have the same thinking style of the teacher are only benefited and rewarded while other students remain a mere listener. Therefore it is very important to know individual differences and their difference in thinking and learning styles.

Many educators are still confused about the learning and thinking styles of the students and that effect on children's performance in schools and that is why attention should be given to children's performance to assess their levels of ability. Both teachers and students tend to exploit their preferred styles, which may or may not match. Therefore, it is important for the teachers to know the students preferred styles, so that the teachers can capitalize and contribute the opportunities for students learning in academic achievement.

ACADEMIC ACHIEVEMENT

Academic achievement at any point is a cumulative function of current and prior family, community, and school experiences. A study of the entire process would require complete family, community, and school histories, and such data are rarely if ever available. Indeed, the precise specification of what to measure is poorly understood. In the absence of such information, analyses that study the contemporaneous relationship between the level of achievement and school inputs for a single grade are obviously susceptible to omitted variables biases from a number of sources. An alternative approach focuses on the determinants of the rate of learning over specific time periods. Previous studies of instructional media were mixed in their findings. While Dewan (1966) had found televised instructional material effective, and Roy (1974) had found no significant effect on cognitive clarity of students through the television lessons of Delhi and that as simulation and utilization bases were the most affected, the present survey contains some frank evaluations of school broadcasts and school telecasts. The advantage of the growth formulation is that it eliminates a variety of confounding influences including the prior, and often unobserved, history of parental and school inputs. This formulation, frequently referred to as a value-added model, explicitly controls for

variations in initial conditions when looking at how schools influence performance during, say, a given school year. While such a value-added framework by no means eliminates the potential for specification bias, the inclusion of initial achievement as a means to account for past inputs reduces dramatically the likelihood that omitted historical factors introduce significant bias.

Academic Achievement can be described as the excelling of a student in academics, by way of achieving good grades which will ensure the route to a successful career in future life. The aims of academic achievement are by and large similar in most educational organizations. Educators stress on the importance of academic achievement, stating that it is the most crucial way of establishing a student firmly on his path to a successful career. Rational and logical thinking have always been associated with learned and educated people. The aim of academics is not to merely gain bookish knowledge; it develops and enhances the ability of an individual to think and perceive the various situations that life offers. The cognitive development and progress of the mental ability of the academician will obviously have a positive impact on the culture and society in which he/she survives. Thus, academic excellence ensures the social development of not only the individual but also the culture with which he/ she is closely related to.

Cohen (2006) elucidates that the subjective experience, which a student/academician acquires by way of schooling, plays an important role in academic progress. Besides the teaching patterns of the school, there are other dimensions which enable successful academic achievement among students. A responsive school climate, which involves parents and caretakers in the process of education, has a positive effect in the educational as well as the social development of the student. Thus, we can

conclude that academic achievement aims to nurture a child and aid his professional, societal and personal growth which would be beneficial to the entire community and cannot be achieved merely by the educational institutions or educators, but the parents have a crucial role in helping their children achieve it.

Academic achievement does not include sport or music. Academic achievement, such as graduating 1st in one class, is sometimes a purely quantitative matter, while having the findings of lengthy, comprehensive research published by a recognized journal is also a notable academic achievement. Being named head/chairman of a particular department at a university is both a professional and an academic achievement. Several national studies have also examined the impact of student mobility on the academic performance of students across grade levels. These studies were based on a national health survey that provided controls for the demographic characteristics of students but not prior educational performance.

These studies found that only frequent, three or more, family moves predicted grade retention (Simpson & Fowler, 1994; Wood et al., 1993). However, another study based on the same data found that even one residential move had a negative impact on a combined measure of both academic and behavioral aspects of school performance, although the negative association was found only among children who did not live with both biological parents (Tucker, Marx, & Long, 1998). The authors suggest that two-parent families may have more so-called “social capital” that can help mitigate the effects of residential mobility (Coleman, 1987). The world is becoming more and more competitive. Academic achievement has become the key factor for personal progress. Parents desire that their children climb the ladder of achievement to as high level as possible. This

desire for a high level of achievement put lot of pressure on the students, teachers and in general educational system itself. Achievement of students in our country is measured in terms of her/his performance in examination. There is not at all desirable permutation but there can't be any running away of this standard formula of achievement on the basis of achievement of school going boys/girls. He/she is bracketed either good/poor, intelligent/slow. In fact, it appears as if the whole system of education revolves round the academic achievement of students.

The importance of scholastic or academic achievement has raised several questions for education researcher. What different factors contribute towards academic achievement etc. The achievement of the child depends upon his conceptual learning and understanding in class. It further depends on numerous factors like child interest and motivation in the subject that they study, the devices and methods adopted by teachers in class, family set-up and situational study habits of variable. It is pertinent to mention that economic, social and cultural factors make their contribution in academic achievement high or low for the students. The mental make-up, personality factors and surrounding do play an important role in shaping the performance of achievement of boys and girls. The variable may be highly anxious to achieve high performance but the factors examined above do have a direct or indirect effect on his performance at different stages of his education. Ability of variable to get experience and desire benefits from them is another factor reckon with. The experts in the field believe that intelligence can't be increased as it is inborn.

CONCEPT OF ACHIEVEMENT

One of the most concerns of education is to ensure that each child is able to make most of his abilities. The problem why students achieve or fail to

achieve in school has always interested psychologists and educators (Naylor, 1972). Achievement in itself has become more or less a power symbol and way of life. However even if the course of life is not determined by achievement, it is essentially directed by it. Hence every individual is obsessed by social and psychological pressures later leads to various tensions and strains. Such resulting tensions are more often disruptive and resulting performance decrements and discrepancies' between potential and performance. In the realm of educational measurement, the most meaningful achievement is almost certainly academic success. Academic achievement constitutes a socially desirable, equally relevant and integral aspect of all students' lives such that all students are motivated to seek academic excellence. Academic achievement is the outcome of training imparted to a student by the teacher in school situation.

Academic achievement of an individual is so far considered to be influenced in part by his ability to make adjust to his environment, in part by his special abilities, aptitude and intelligence, which are integral part of his personality and in part by the intensity of drives and motives which serves as the impelling for his activities. Thus academic achievement refers to the degree or level of success and that of proficiency attained in some specific area concerning scholastic and academic work. In the view of Good(1959),there seem to considerable similarities in as much as all of them place emphasis on knowledge attained or skills developed in academic subjects and designated by test score. It is different from proficiency in the area of different arts or physical skills. Academic or educational age, accomplishment quotient or achievement quotient are the most commonly used means to intercept the level of achievement of pupils in general or in specific subject matter. According to Tang and Thomas

(1977) achievement means performance in school or college in a standardized series of educational tests. The term is used more generally to desirable performance in the subjects of curriculum.

IMPORTANCE OF ACADEMIC ACHIEVEMENT

In the present world thing is changing is very fast. There is an explosion of knowledge in all walks of life. The growth of science and technology has brought changes in socioeconomic condition of the society. Because of explosions of aspirations, every parent today sets high goals to educate his child. Thus academic achievement has become a case of educational growth. Good academic achievement help to develop self esteem self respect and self confidence and helps the individual to create a niche for himself in the competition ridden society. Academic achievement has a great importance in personal life. Success in academic subjects act as an emotional tonic and and damage done to a child in the home or neighborhood may be partially repaired by success in school or college. It motivates the students to set high goals for themselves. Importance of academic achievement can be judged when we realize fuller and happier life, which we wish for every student, would be impossible unless he has attained high degree of proficiency in his subjects.

Academic achievement to a great extent predicts the future of student. At the time of admission, for entrance in job or for further studies, good academic achievement record is the only recommendation. Therefore, academic achievement is the unique responsibility of all educational institutions established by society to promote a whole sum scholastic development of the student.

CHARACTERISTICS OF ACADEMIC ACHIEVEMENT

- Academic achievement is all about what students can actually do when they have finished a course of study Degrees and programs list this information and call it “competencies”
- Competencies are measured as students graduate.
- The results are used to improve program and degree outcomes.
- Each degree or program publishes an annual report.
- The report is a way of knowing how well an individual program or degree is doing in preparing students.

FACTORS AFFECTING ACHIEVEMENT

Academic Achievement depends upon numerous factors which are responsible for high, average or low academic achievement of students. These factors are

1. Cognitive factor: it includes intelligence; creativity and language ability.

2. Non-cognitive factors: It includes variables such as self concept, adjustment and level of aspiration, needs motivation, aptitude, anxiety values and self-confidence.

3. Home environmental factors: It includes demographic variables i.e. socioeconomic status, residential background, parental aspiration and expectations, parental education and occupation, sex etc.

4. Social environmental factors: It includes personality, attitude, method of teaching, curriculum, emotional climate of school etc.

Academic achievement is a multidimensional and multifaceted phenomenon. There are many factors which affect academic achievement viz. intelligence, personality, motivation, school environment, heredity,

home environment, learning, experiences at school, interests, aptitudes, family background, socio economic status of the parents and many more other factors influenced the academic achievement. Sinha (1970) reported that hard work, intelligence, memory, good health, availability of books, methods of study, financial security and interest in social and practical work affect the academic scores. The formal investigation about the role of these demographic factors rooted back in 17th century (Mann, 1985). Generally these factors include age, gender, geographical belongingness, ethnicity, marital status, socioeconomic status (SES), parents' education level, parental profession, language, income and religious affiliations.

However, most of the above given factors have been considered and studied for research under the classification of subjective and objective factors. Subjective factors are related to the individual himself while influencing one's achievement as intelligence, learning ability, self efficacy, learning style, study habits, creativity, level of aspiration, self concept, locus of control etc. whereas objective factors are related to the environment of the individual as socio economic status, educational system, family environment, evaluation system, value system, teachers' efficiency, school situation and environment. Aggarwal et al. (1998) reported that main factors affecting academic achievement are affective factors viz. cognitive style, motivation, anxiety, study habits, level of aspiration, stress, value, perseverance, self efficacy, emotional maturity, attitude, adjustment, interest, need and curiosity; cognitive factors viz. ability, intelligence, creativity, problem solving, reasoning ability and learning rate; school related factors viz. type of school, school climate, teacher's personality, home work, alienation, teachers' expectation and attitude, training strategies, teachers' experience, medium of instruction, teachers' behavior and competency and class room environment; home

related factors viz. family size, birth order, socio economic status of family, gender bias, parental involvement, parental support, deprivation, child rearing practices, working networking parents, parental aptitude and expectations.

LEARNING AND THINKING STYLE

Education is a lifelong process and it starts from the day a child is conceived and ends with the death of an individual. It is a process through which human personality develops. In the society an individual acquires education through formal, informal and non-formal ways. What happens to us in life depends on not just ‘how we’ think, but ‘how well’ we think and learn. Of all the factors that influences an individual; his styles of learning and thinking. It plays a major role. One child may perform tasks in an orderly and systematic pattern and another may perform tasks in an unsystematic pattern. This is due to individual differences in their style of learning and thinking. A variety of life is found on this auspicious planet, known as earth.Among all the living bodies, only human beings have the cognitive abilities. All the human beings can learn but not in the same way. Researchers have found the traditional method of teaching ineffective to teach all the varied students (A.W. Carns & M.R.Carns; 1991, Minotti; 2005). Although a certain teaching style may be helpful for some students, it may actually hinder others (Charkins et al; 1985). One way to differentiate instruction is based on students’ learning style preferences. Students’ learning style profiles could be used as a blue print for teaching (Vincent & Ross; 2001). Here are number of learning related concepts, one particular concept which has provided some valuable insight into learning in both academics and other settings, is learning style. “Simply being aware that there can be different ways to approach teaching & learning can make a difference” (Yerxa; 2003).

Research on “Learning styles” emerged in early 1960s. Learning style concept first appeared in the study of individual differences. “People also share a common cultural background, to a certain extent, common patterns of intellectual abilities, thinking styles and interests”. Grigorenka & Sternberg (1997) suggest that thinking styles significantly add to abilities as a tool for predicting academic-achievement.

Learning and thinking styles have been defined as mental framework which makes a person able to process information and solve problems in some specific ways (Saracho; 1998, Zhang & Sternberg; 2006, 2007). Styles indicate the hemisphericity functions of the brain and students’ learning strategy and information processing are based on the preferences of the brain area (Venkataraman; 1994). Research results have shown that the human left cerebral hemisphere is to be specialized for primary verbal, analytical, temporal and digital operations (Bogan; 1989, Gazzaniga; 1990, Fitzerad Hattie; 1993).

Right cerebral hemisphere is specialized for non-verbal holistic, concrete, creative, analogic and aesthetic functions. Difference between the two hemispheric preferences in performing and processing information is considered style of learning and thinking by Torrance.

Three types of learning-thinking styles are as follows:

Auditory

Auditory learners are able to learn best by listening Lectures and the other audio mode of information helps them to learn quickly.

Visual

Visual learners learn best when content material is presented with the help of visual aids like charts, pictures, writing boards, flash cards etc.

Kinesthetic

This type of learners learns better when they do something by their own hands and by using their sense of touch. They are also known as Tactile Learners.

Thinking Style

Thinking style refers to the process in which a learner processes information in his brain, naturally and effectively. Brain/Hemispheric dominance among thinking styles type is as follows:

- **Left Brain Dominant**

Left Brain dominant thinkers use to process information in a sequence. For example step 1, step 2, step 3 and so on…….They can learn easily if information is presented step by step.

- **Right Brain Dominant**

Right Brain dominant thinkers use to process information presented as a whole. They learn better when information is presented as a whole. Even they lose their patience or get irritated with information presented step wise.

- **Integrated/Whole Brain Dominant**

Whole Brain users tend to process information both of the ways. Nurturing individuals styles of learning and employing certain methods and learning techniques, equips learner with tools to act effectively in the school environment and satisfies intellectual and emotional needs (Honigs feld & Dunn, 2006).

Definitions:

According to Mohsin (1967) – “Thinking is an implicit problem solving behavior”.

According to Garret :- (1968) “Thinking is behavior which is often implicit and hidden and in which symbols (images, ideas, concepts) are ordinarily employed.”

Therefore, thinking may be defined as a pattern of behavior in which we make use of internal representations (symbols, images, signs etc.) of things and events for the solution of some specific, purposeful problem. Thinking is a mental process which stars with a problem and concludes with its solution.

Five Thinking Styles:

According to Bramson, the five thinking styles are:

- Synthesists
- Idealists
- Pragmatist Thinkers
- Analyst Thinkers
- Realist Thinkers

Synthesists:

According to Bramson, “Synthesists are creative thinkers who perceive the world in terms of opposites. When you say black, they think white, when you say long, they think short.” To connect with Synthesists, Bramson suggests “listen appreciatively to their speculation and don’t confuse their arguing nature with resistance.”

Idealists:

According to Bramson, “Idealists believe in lofty goals and standards.” To connect with Idealists, Bramson suggests “associate what you want to do with these goals of quality, service, and community good”.

Pragmatic Thinkers:

According to Bramson, “Pragmatic thinkers are flexible, resourceful folk who look for immediate payoff rather than for a grand plan that will change the world.” To connect with Pragmatists, Bramson suggests “emphasize short-term objectives on which you can get started with resources at hand.”

Analyst Thinkers:

According to Bramsom, “Analyst thinkers equate accuracy, thoroughness, and attention to detail with completeness. They are likely to gather data, measure it, categorize it, and rationally and methodically calculate the right answer to any problem you come up with. To connect to Analysts, Bramson suggests “provide a logical plan replete with back-up data and specifications.”

Realist Thinkers:

According to Bramson, “Realist thinkers are fast moving doers who know that reality is what their senses – sight, sound, taste, smell, and touch – tell them it is, and not that dry stuff that one finds in accounting ledgers, or the insipid pages of manual of operations.” To connect with Realists, Bramson suggests, “If you communicate with Realist bosses as if they were Analysts, you will never get their attention. Rather than gobs of computer-printouts and other detailed information, Realists want a three-paragraph “Executive Summary” which tells briefly what is wrong and how you propose to fix it. For rather complicated reasons, they will often take you at your word if they see you as a qualified expert. You become an expert

in their eyes when they know that you've assembled a store of facts in which they are interested, and you have proposed a set of actions that they already believe are the best things to do."

CONCEPT OF LEARNING STYLE

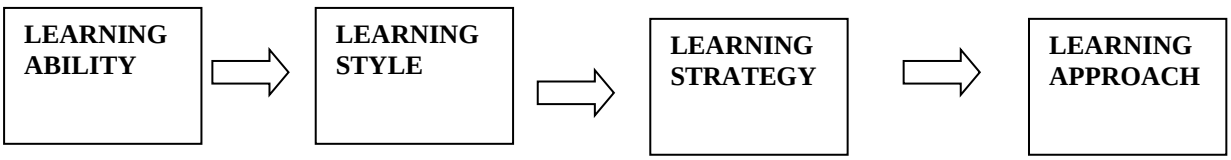
The simplest definition of a learning style is the learning strengths and preferences of a student. However, many other definitions exist, such as the one given by the National Association of Secondary School Principals. They define a learning style as "the composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (Keefe & Monk, 1986, p 1). According to Sharma "cognitive style refers to the characteristic way in which an individual organises his environment and accordingly acts on it. These are intrinsic information-processing patterns that represent a person's typical mode of perceiving, thinking, remembering and problem-solving." She also defines learning style "as the composite of characteristic cognitive, affective and physiological factors that serve as a relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment." Despite the plethora of definitions for learning styles, the basic idea can be seen through a few examples provided by Felder (1996). He discusses that some students might focus on facts while others prefer theories or that some students learn better visually and others verbally. In other words, a learning style may be defined as a habitual pattern or a preferred way of acquiring knowledge or doing something.

DISTINCTION BETWEEN LEARNING STYLE, STRATEGY AND APPROACH:

At the outset, it is necessary to distinguish between the terms ‘styles’, ‘approaches’ and ‘strategies’. In the Psychological literature, the term ‘styles’ has been used to convey the marked differences in preference shown by people as they carry out task. According to Webster’s Dictionary (1967), “A style is a distinctive or c Webster’s Dictionary (1967), “A style is a distinctive or characteristic manner …or method of acting or performing”. (p.873). Allport, the Psychologist defined a style as a means of identifying distinctive personality types or types of behavior. On the other hand, the term ‘strategy’ has been used to convey preference which are more task related whereas the term ‘approaches’ has been used to convey “processes” and “pre-dispositions” to adopt particular processes. Learning styles operate without individual awareness and imply a higher degree of stability.

On the other hand, learning strategy implies operations followed to minimize error during decision-making process involves a conscious choice of alternatives and is dependent on the task or context.

Learning approach refers to (a) the processes adopted during learning, which directly determine the outcomes of learning and (b) the predispositions or orientations to adopt particular processes. In short, the relationship between these concepts can be ordered as follows:



Personality has been assumed to be a source of variation in learning styles among individuals.

MEANING OF LEARNING STYLE:

Several definitions of learning style currently exist. Keefe defined learning style as being characteristic of the cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment. Learning style also represents both inherited characteristics and environmental influences. Dunn described learning style as "... the way each learner begins to concentrate, process, and retain new and difficult information" (p. 224) She noted that this interaction occurs differently for everyone. Dunn also highlighted that "To identify and assess a person's learning style, it is important to examine each individual's multidimensional characteristics in order to determine what will most likely trigger each student's concentration, maintain it, respond to his or her natural processing style, and cause long-term memory" (p. 224).

DIMENSIONS OF LEARNING STYLES

Many theories of learning styles can be condensed and examined in four dimensions as follows (Curry, 1987).

1. Personality of the learners

A learner's personality influences how he/she acquires and integrates information. Some learners look at a whole picture at first and isolate it down into smaller parts with ease they are field-independents, others start to observe the pattern or relationships between the parts first before looking at the whole picture, they are field-dependent. As abstraction is easier for the former type of learners, and integration is easier for the latter. Field dependent individuals are considered to be more group- oriented and cooperative and less competitive then field-independent individuals (Dunn & Griggs, 1996). Some learners tend to respond quickly as compared

to others who respond slowly and thoughtfully. The quick respondents can be categorized as risk-taking which the other can be considered as cautions learners.

2. Information Processing

Information processing is the preferred style to assimilate information. There are to independent approaches:

(a) Cognitive Styles – Intrinsic patterns of a learner's typical mode of perceiving, thinking, remembering and problem solving (Schme UK, 1983; Kolb, 1984).

(b) Constructivism – i.e. how a learner constructs his/her own view (Fosnot, 1996).

The later concept is more learner – conferred and includes a learner's self – regulation in the learning process and self determination in motivating him/ herself (Deci, Vallerand, Pellertier & Rgan, 1991)

In this case, the learners set goals, organizes resources makes strategic decisions about resource case, and evaluates the entire process (Weinstein, 1996).

3. Social and Situational Interaction among Learners

Social interaction addresses how students interact in the classroom. Reichmann and Grasha (1974) defined a few types of learners according to their types and levels of interactive and participant / avoidant.

4. Instructional Methods

Instructional methods address the individual learner's preferred environment for learning (Keefe, 1989; Dunn & Dunn, 1978). These methods basically ascertain the importance of identifying and addressing

individual differences in the learning process. However they differ in way that some models stress accommodation of individual style preferences in the instructional methods, while others stress flexibility and adaptation by the learners.

JUSTIFICATION OF THE STUDY

The justification of a research project lies in its contribution to society for its welfare because national unity is the basic need of India. It is time of lively approval of educational development in India. When many changes are occurring, it is a time of lively approval witnessed in organization, curricula and teaching techniques, pertinent to seek systematic and up to date information on the significant correlate of students' achievement. Processing and retaining information according to one's own way is one's style of learning-thinking. It is indicated by one's hemispheric dominance. Way of learning and processing information are based on preferences of the hemispheric dominance. Teaching without knowing students' learning-thinking style may be a total waste of time, energy, resources and money. Success of educational efforts can be easy and quick if teacher comes to know his students' learning and thinking styles. Teacher can get more output in less input and thus can save time, energy and other resources. It is appropriate in this context to consider at once factors affecting the academic achievement such as pupil's learning and thinking styles, etc.

Today's modern society expects everyone to be a high achiever. The key criteria to judge one's true potentialities and capabilities are perhaps academic achievement. Academic achievement has become an index of a child's future. Therefore, it is putting a great pressure on the minds of children and their parents. This academic achievement is a function of learning and thinking styles, and is the resultant of various other variables.

Research studies have proved that a good, supportive environment according to child's learning and thinking styles can enhance academic achievement. Self-concept and emotional intelligence, being the major psychological factors have great influence and bearing on the development of the child. It has been shown by various studies that most of the children who are successful /great achievers and well adjusted have good academic record. So, it is the academic achievement which sets the pattern for the Childs' attitude towards people and society, aids intellectual growth in the child and supports his aspirations and other achievements.

Identification of learning and thinking styles allows an individual to capitalize on their strengths and improve self advocacy skills. Several studies have identified that male and female students have significantly different learning and thinking styles from each other. The research also acknowledged that secondary school students with higher grade-point averages had significantly different styles from those with low grade-point averages. The importance of academic achievement has raised several important questions for educational researchers. What factors promote achievements in students? How far do the different factors contribute towards academic achievement? Do psychological factors have any influence on academic achievement? etc. Many factors have been hypothesized and researched upon. Researchers have come out with varied results, at times complementing each other, but at times contradicting each other. A comprehensive picture of academic achievement still seems to eluding the researchers. It has been accepted that that psychological factors have great influence on the academic achievement of the students.

The investigator, in this study, have attempted to find out the impact and correlation of learning and thinking styles with the academic achievement of the students i.e. boys & girls; rural and urban students of North Delhi.

The research will be valuable because it will throw light on the relation of learning and thinking styles which affect the academic achievement of the students.

STATEMENT OF THE PROBLEM

A STUDY OF ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS OF NORTH DELHI IN RELATION TO THEIR LEARNING AND THINKING STYLES

OPERATIONAL DEFINITIONS OF THE TERMS USED

Academic Achievement: Academic achievement is the knowledge attained or skills developed in school subjects usually designed by the test scores or marks assigned by the teachers.

Learning and Thinking Style: The way each learner begins to concentrate, process and retain new and difficult information.

Senior Secondary School Students: students studying in grade-11.

OBJECTIVE OF THE STUDY

1. To study the academic achievement of senior secondary school students of North Delhi.
2. To study the learning style of senior secondary school students of North Delhi.
3. To study the relationship of academic achievement and learning style of senior secondary school students of North Delhi.
4. To compare male and female senior secondary school students of North Delhi on their academic achievement.
5. To compare male and female senior secondary school students of North Delhi on their learning style.
6. To compare urban and rural senior secondary school students of North Delhi on their Academic Achievement.
7. To compare urban and rural senior secondary school students of North Delhi on their learning style.

HYPOTHESES

1. There is no relationship of Academic Achievement and Learning and Thinking styles of senior secondary school students of North Delhi.
2. There is no significant difference between male and female senior secondary school students of North Delhi on their Academic Achievement.
3. There is no significant difference between male and female senior secondary school students of North Delhi on their learning and thinking styles.
4. There is no significant difference between urban and rural of senior secondary school students of North Delhi on their Academic Achievement.
5. There is no significant difference between urban and rural of senior secondary school students of North Delhi on their learning style.

DELIMITATION

The study will be delimited to:

1. Present study was confined to the North Delhi only because of geographical area limitations. It was not possible to measure the aspects beyond the available tools, so the study was confined to measure the aspects within the limit of available Standardized tools.
2. 100 senior secondary school students of North Delhi.
3. Students learning and thinking styles will be measured only on those dimensions covered in Style of Learning and Thinking by Dr.D.Venkataraman.

4. Academic achievement will be measured by obtaining final result of senior secondary school students of North Delhi.
5. Only random sampling technique will be used.

CHAPTER-II

REVIEW OF RELATED LITERATURE

REVIEW OF RELATED LITERATURE

Escalation of knowledge in modern times is an accepted fact. A review of related literature in the area of investigation is of prominent significance and its importance cannot be denied in any research. The review of related studies is an exacting piece of work calling for a deep insight to provide clear-cut perspective of the overall field. The term ‘Review’ means to organize, to envelope an edifice of knowledge, to show the present study would be an addition to a particular field. The term ‘Literature’ refers to the knowledge of a particular area of any discipline, which includes theoretical, practical and research studies. In tracing roots of problems, preparing outlines of the study, discussion and interpretation of the results and writing the research report, review of literature is of utmost importance. The study of related literature is useful to search the update and latest information already available and to define the limits of the specific problem.

Research takes advantage of the knowledge that has accumulated in the past as a result of constant human endeavours. Review is not only important from theoretical point of view but it also provides guidelines to decide procedure and tools to be used. The keys to the vast store house of published literature may open new doors to source of significant problems and explanatory hypothesis which provides helpful orientation for the definition of the problem and background for the selection of procedure.

Thus, the study of related literature helps investigator to acquire comprehensive information about what has already been done in a certain field. It helps in formulation of hypotheses and provides necessary knowledge regarding the methodology to be followed. For worthwhile

study in any field of knowledge, the research worker needs an adequate familiarity with the work which has already been done in a particular area. The search for related material is a time consuming but fruitful phase of research programme.

With this background in view, the investigator tapped various sources of available literature like surveys of research, research journals, magazines, dissertations, 41 encyclopaedias available in the University libraries and educational research centers of the country as well as studies available on various websites and other sources of information related to the present study. A brief review of related studies is discussed under the following headings:

1. Studies related to learning styles
2. Studies related to learning styles and academic achievement
3. Studies related to thinking styles
4. Studies related to thinking styles and academic achievement
5. Studies related to learning styles, thinking styles and academic achievement.

STUDIES RELATED TO LEARNING STYLES

Al-Qahtani and Al-Gahtani (2014) assessed learning styles of Saudi dental students using Kolb's learning style inventory. Results indicated that diverging learning style was the dominant style among those in the sample. They also found that students preferred the assimilating style during their early preclinical years and preferred the diverging style during their later clinical years.

Mohammadi and Thaghinejad (2014) identified the most common learning styles of nursing students in Iran. Kolb's learning style inventory was used to collect the data. Results concluded that in order to enhance students learning, more attention has been required to different learning styles. It was also recommended for teachers to pay more attention in student's learning style and use appropriate teaching methods.

Sinnerton et al (2014) investigated awareness of educator about learning style preferences to enhance the education and training of allied health professionals. Results found that encouraging educators in allied health programmes had a positive impact on the teaching and learning process. It was also observed that by employing various strategies; educators can help the students to study according to their learning style preferences, engage more deeply with the course content and hence improve overall student outcome for training in allied health programmes.

Shukr et al (2013) studied learning styles of postgraduate and undergraduate medical students. A total of 170 students were taken. Learning style questionnaire was used to assess the learning styles of students. The results revealed an overall statistically significant difference in learning style preference between the two groups. Postgraduates commonly had reflector learning style while the undergraduates were predominantly activists and theorists.

Tulbure (2012) focussed on relationships between teaching strategies, learning style and student achievement in higher education. Sample of 269 pre-service teachers from three Universities were taken and data was collected through survey method. One way analysis of variance was used. Significant differences among three categories of students with different

majors occurred in relation with the most effective teaching strategies corresponding to each learning style category.

Halstead et al (2010) conducted a study on learning styles as a tool for selecting students for group work. The sample included 24 second year and 9 third year undergraduate students. The learning style questionnaire was given to two separate groups of students and students were selected on the basis of their learning style and formed a group. The results revealed that students who joined groups allocated on the basis of their learning style performed better than the students who were self selected.

Paul et al (2009) conducted a study on learning preferences of medical students and explored differences in learning preferences from 1st to 4th year students. Total 95 students were administered the learning preferences inventory (LPI). Analysis of variance (ANOVA) was used to test the significance of the differences of the six LPI mean scores on abstract/concrete, teacher structured/student structured, and individual/interpersonal categories across the academic year. Results of this study showed that students preferred teacher structured learning experiences dealing with concrete and applied tasks, rather than abstract tasks.

Penger and Metka (2009) explored the learning styles of students enrolled in the economics of education course at the faculty of Economics, Ljubljana University. The study method included both a descriptive and an exploratory perspective. A qualitative method was used to overview the literature background and factor analysis was used to extract the learning styles. The findings outlined that difference in learning styles exists among students.

Santo (2008) explored relationship between learning style and online learning. Sample taken were of adult learners. Nine different instruments were used to find this relation. Focus was on the extent to which learning styles were able to predict student's success i.e. grades and attitudes. Results found that significant relationship exists between learning style and online courses.

Holt et al (2007) studied learning preferences of 5th and 6th grade students in northwest Arkansas. The learning style inventory was administered to the students enrolled at four elementary schools. The sample consisted of 160 students. Results showed that students preferred quiet noisy levels, dim light, high structured, informal design and authority figure around. Students also preferred variety of materials and learning methods especially tactile and kinesthetic.

Verma (2006) analysed the variability in learning style of students enrolled in different courses. The sample consisted of University students in different courses i.e. private law, criminal law and administrative law. They're learning styles were assessed with the help of learning style inventory. Results confirmed that there was variability in learning styles of University students.

Haley and Smith (2005) conducted a study to investigate relationship between learning style preference and entrance of medical students in the institution. The objective of the study was to identify learning style of new entrants to medical school. A sample of 219 students was taken and the results indicated that reflector learning style was dominant. Over 50% of students changed their learning style over the year, with activists becoming the dominant group. Finally, theorists achieved higher results in the end of year examinations.

Yacizi (2005) studied collaborative learning style and learning performance. Sample included male and female students. Study found that participant or collective style was a significant predictor of female student's performances, while the independent and competitive styles were significant in predicting the performance of male students. These findings explained that male students had more competitive qualities and they would prefer to study hard independently in order to win and stay competitive. In contrast, the female students were more dependent on their group members and also they would try to help and complement each other to perform well in academic performances.

Barnes et al (2004) identified differences in the learning styles of the online students. It was found that 64% of the population surveyed was diverges, 32% were assimilators and 2% were either accommodators or converges and 2% had a combination of all styles. Results indicated that students had preferences in certain course delivery methods over others. It was found that there may be differences in learning outcomes for certain courses when courses were offered at different locations.

Rayneri and Gerber (2004) in their study on classroom performance of gifted middle school students and preference for learning style found that learning style plays an important role in classroom performances. Results showed that they had a high preference for tactile and kinaesthetic learning style. Study also found that mismatch in the student's learning style preference with learning environment would result in academic underachievement.

Werner (2003) studied the effect of self awareness about learning styles on the selection of learning strategies and the development of comprehension process. Kolb's learning styles inventory was used to

identify the learning styles of forty one adult learners and observed for six months. The subjects tackled strategies and 46 techniques on the basis of time, keeping in the memory, reading, note taking and decision making. The data concerning the learning preferences of subjects were collected through the compositions they wrote. The findings showed that learning types preferred according to the learning styles of the subjects were not the appropriate strategies.

Paula (2002) did comparative analysis of the learning styles of Brazilian and German adolescents by age, gender and academic achievement levels. The purpose of this study was to identify and compare the preferred learning style characteristics of adolescents from the countries of Brazil and Germany and to analyze the similarities and differences by age, gender, and academic achievement within these groups of students. Results concluded that overall, both Brazilian and German were more tactual and parent motivated. In general, Brazilian were more self and teacher motivated, prefer learning with peers and Germans were more authority oriented and persistent than Brazilian. These findings revealed that significant differences in learning style preference varied among students by age, gender and academic achievement.

Moss et al (2001) explored the relationship among learning style and selected teaching strategies on student's performance. The sample was of 186 students of undergraduate courses in agricultural economics. Results indicated that active learning and problem based learning techniques, as a supplement to the traditional lecture format could significantly affect their performance in an introductory course in agriculture resources and food.

Hong et al (2000) examined whether changes in children's learning styles can occur from cultural, social and environmental changes within an ethnic

group using LSI scores from a sample of 49 Korean-American students. Similarities and differences in learning styles were found between two nations as well as between boys and girls in both groups. Those learning styles, on which differences were significant, might be influenced by the social and environmental differences.

Vermetten et al (1999) conducted a study on consistency and variability of learning strategies in different University courses. Participants were 85 students attending the first year of law studies. An analysis of variance showed that students varied in their reported learning strategies as a function of different learning contexts. Evidence was found that learning strategies differ among each other in degree of variability.

Riding and Rayner (1998) studied cognitive style and learning strategies. Study found that given a choice of learning material, verbalizers will choose the text version, and imagers will choose the version with illustrations. Imagers almost double their learning performance if they were presented with information that include text and illustration compared to just text, while the performance of verbalizes remains the same.

Wallace (1995) assessed how closely student learning style preferences matched those of their teachers. A total of 450 sixth and seventh graders completed the LSI and 128 teachers completed the productivity environmental preference survey, the adult version of LSI. Results found that auditory style was the teacher's most preferred learning style, while students preferred the visual modality.

Hickson et al (1994) explored learning style differences in middle school pupil from four ethnic populations. Thirty six Asian, forty seven Hispanic, seventy eight African-American, fifty eight European American 4th-6th graders completed the learning style inventory. Results indicated that 12

variables on that instrument reliably discriminated among the four ethnic groups. These variables were design, requires intake, late morning, noise level, kinesthetic, responsible, parent's figure motivated, authority figure present, temperature, afternoon, auditory, visual. Recommendations were made for adapting the environment to accommodate students according to their preferred learning styles.

Hayes and Allinson (1993) examined the interaction between individual learning style and instructional strategies. Results indicated that instructional strategies influence the achievement level of student's with different learning styles.

Ewing et al. (1992) studied whether significant group gender and grade differences existed in the preferred learning styles of gifted minority 6th-8th graders. Fifty four African-American, sixty one Mexican-American and forty Chinese-American students completed LSI. Significant gender differences were found in preferences for tactile and intake modality. African-American preferred visual modality and studying in the afternoon. Mexican-American preferred a kinesthetic modality. Chinese-American reported the strongest preference for visual modality of the three groups.

Matthews (1991) conducted study on the effects of learning style on grades of first year college students. This study compared the grade point averages of 796 first year students in five institutions of higher education. Learning style inventory by Canfield was used. Results showed that there were no race differences in the proportion of students in various learning style, but gender differences existed. Female learned best with social and independent/applied styles. However, males learned best with social/applied and social conceptual styles.

Rollins (1990) analysed the theoretical relationship between learning styles of students and their preferences for learning activities. The population consisted of 10603 students enrolled in 262 secondary agriculture programs in public high schools. Myers Briggs Type Indicator (MBTI) form was administered to all respondents. Findings confirmed that 70% of secondary students preferred the sensing learning style and educators should make use of sequential exercises and experiments, group discussions, projects, team competition, demonstrations that provide new skills.

Cox et al (1988) examined learning style variation between rural and urban students by taking a sample of secondary school students. Learning Style Inventory (LSI) was administered to 9th to 12th grade students enrolled in different classes. Statistical significant differences were observed. Rural students were found to be significantly higher in the serious, analytical and active, practical learner characteristics, than their urban counterparts. Smaller but significant differences in preferred learning styles were found for other characteristics. Findings suggested that students in rural school appear to be more concerned and engaged in educational process than urban students.

Payton et al (1979) conducted a study on learning style preferences of physical therapy students in the United States. The purpose of this study was to find the learning style preferences of students enrolled in their first year of basic professional program. The testing instrument used was the learning styles inventory developed by Canfield and Lafferty. A sample of 1099 physical therapy students was collected. Results had important implications for physical therapy educators in terms of arranging their instructional activities to optimize learning.

STUDIES RELATED TO LEARNING STYLES AND ACADEMIC ACHIEVEMENT

Narayani (2014) studied the learning style of higher secondary students in relation to their academic achievement. The sample consisted of 300 students. Barbara and Soloman Learning style questionnaire (LSQ) was used. The results showed that there was no significant difference between active and reflective style learners in relation to their academic achievement.

Vania and Xin (2014) performed comparative analysis of the relationship between learning styles and mathematics performance. Sample included comparative analysis between middle school students of USA and three Asian countries namely Hong Kong, Japan and Korea. Findings indicated that competitive learning had a statistically significant positive though small relationship with mathematics performance in all four countries while cooperative learning had a statistically significant positive though small relationship with mathematics performance in three Asian countries, but not in the USA. It was recommended that teacher education may hold the key to improve the educational practice of different learning styles as a strategy to improve mathematics performance.

Mahshid et al (2013) observed the impact of learning styles and University type on the academic performance of the students. A sample of 339 students was taken and Kolb's learning style questionnaire was used to determine the learning style and academic performance of the students. Results of Chi-square test found that there were differences in the learning styles of students. Also, results of Manova showed that University type and learning style both had a significant impact on the academic performance of students.

Pornsakulvanich et al (2012) examined the influence of big five personality traits and learning styles on cognitive and affective academic performance and gender differences in learning styles. Total 1529 students of business administration from University of Thailand were taken. Overall, results indicated that personalty traits found to be better indicator of cognitive and affective academic performance than learning styles. The results also confirmed that no significant gender differences existed in learning styles of students.

Rahmani (2012) investigated the relationship between learning style of high school girl students and their academic achievement. The target population was 350 high school girls selected by multi-stage sampling method. Feldor and Soloman LSI were used and results showed that sensing intuitive learning style had significant correlation with academic achievement.

Breckler et al (2011) analyzed academic performance and learning style self prediction by second language students in an introductory biology course. Sample was undergraduate students of biology from University of California. Results showed significant relationship between academic performance and learning styles.

Haider et al (2010) conducted an investigation of relationship between learning styles and performance of learners. The experiment was conducted on 35 students. The results indicated that significant number of academic deficient learners were not inclined towards a specific learning style. However, learners belonging to verbal learning styles did well in introduction to ‘engineering profession’ subject. Learners who were neutral to visual verbal learning style group did well in ‘computer

programming' and those who belong to active learning group did well in 'database management system'.

Elizabeth et al (2009) studied learning styles of high and low academic achieving teacher education students. Using the parameters set in the research, there were 19 students classified as low achievers and 29 students classified as high achievers. Results of the study revealed no significant difference in learning styles between low achieving and high achieving students. Teachers were recommended to incorporate specific methods reflective of visual, auditory, tactile and kinesthetic styles of learning in their teaching strategies.

Aripin et al (2008) conducted a study on student's learning styles and academic performance. The objectives of the study were to ascertain the dominant learning styles and to discover the relationship between learning style and academic performance of the students. The Grasha Reichmann student's learning style scales (GRSLSS) instrument was administered to determine student's learning style preferences in six learning style categories. The subjects of the study were first year students from INTEC University. Results indicated academic performance based on learning style was found to be significant.

Graf et al (2007) analyzed the interaction between student's learning styles, achievement and behaviour in mismatched courses. The impact of the strength of learning style preferences on achievement, correlation between particular learning styles and achievement were analyzed and discussed. The study found that students with strong learning style preferences had more difficulties in learning in mismatched courses. It was also found that reflective learners could cope better with mismatched

courses than active learners and significant differences were observed in learning styles of different achievers.

Malathi et al (2006) observed learning style of higher secondary students of Tamilnadu. The sample of the present study consisted of 160 higher secondary students from private and government schools. The objectives of the study were to find out learning style of higher secondary students and find out the significant difference in the learning style of students in terms of their sex, class and type of school exists. Significant difference in learning style between boys and girls was found.

Reyneri et al (2003) studied the impact of learning style preferences in the classroom. The study revealed some differences between achievers and underachievers in their preferences for quiet or sound, flexibility or structure in assignments, and level of need for mobility. Many low achievers showed a strong need for tactile and kinesthetic modalities. Persistence seemed to be a key to success for the achieving learners in this study since they were able to maintain high academic performance in all content areas.

Soylu et al (2002) found the effect of learning styles on achievement in different learning environments which were designed according to principles of Generative Theory of Multi Media Learning. Research was conducted in the framework of single group repeated measures experimental design model and three different learning environment were planned (text based, narration based, computer mediated) and group studied in these environments at different times. The two instruments were used to collect data for this study. The pre-post test were designed to identify student's achievement's score and Kolb's learning style inventory to measure student's learning style. Results showed that the type of the

learning style had significant correlation with student's achievement in different learning environment.

Park (2000) studied subjects from Southeast Asian immigrants, Cambodians, Lao and Vietnamese and found that there was no statistically significant difference among high, middle, low achieving groups in their preferences for auditory, visual, kinesthetic or tactile learning styles. Southeast Asian students showed either major or minor preference for group learning compared with East Asian students who showed negative preference for group learning.

Matthews (1996) investigated relationship of learning styles and perceived academic achievement. Sample included high school students. Results showed that students with de-emphasis on human relationship and emphasis on deductive thinking rated themselves higher academically than their peers with other styles of learning and students who were people oriented had the lowest overall academic achievement.

Dunn et al (1995) studied a metaanalysis of 42 experimental studies across United States at 13 different Universities during 1980s. The analysis revealed that students learning style preferences were the strengths that enable them to master new and difficult information. Referring to the standard normal curve, this suggested that students, whose learning styles were accommodated, expected to achieve 75% of standard deviation higher than students who had not their learning styles accommodated. Study indicated that matching student's learning style preferences with educational interventions compatible with those preferences were beneficial to their academic achievement.

Jacobs (1987) determined whether a difference existed in the learning styles of Afro-American high, average and low achievers and compared

the learning styles of Afro-American and Euro American high, average and low achievers. The sample included 300 students from three middle schools in the south. The LSI was administered to ascertain individual learning style characteristic. Chi square was used to analyze the data. Analysis of the data revealed that there were differences in learning styles according to achievement level, sex and race.

Cody (1983) examined the learning styles of highly gifted, average and underachieving students. The results confirmed that students with an IQ of 145 or higher, 9 of 10 were global, students with an IQ of 135 or higher, 8 of 10 were analytic and analytic performed better than global in school. Furthermore, Cody noted that the learning styles of gifted, average and underachievers were very different from each other.

STUDIES RELATED TO THINKING STYLE

Fahmi Hasssan (2014) aimed at exploring the correlation between coping strategies and thinking styles. Sample consisted of 62 students from medical science college responded to the scale of coping styles and inventory of thinking styles questionnaire. Results found that active coping strategy was affected significantly by legislative, local and hierarchical thinking styles. Moreover, potential implications of the impact of thinking styles on coping strategies were also considered.

Holmes et al (2013) explored relationships of children's thinking styles, play preferences and school performance. For the study, 74 middle school children of mostly Filipino and part Hawaiian heritage were taken as sample. Using the group embedded figure test, written responses to three questionnaires, the authors found significant relationship between children's thinking styles and academic performance.

Turki (2012) aimed to recognize the thinking styles in the light of Sternberg's theory prevailing among the students of technical University and its relationship with some variables. The sample consisted of 800 students. Sternberg and Wagner (1991) inventory was used. The results indicated statistical difference in legislative and judicial styles where the differences came in favour of males and significant differences of executive style came in the favour of females.

Balgalmis et al (2010) investigated thinking styles of educational administrators in Turkey. Thinking styles were compared in relation to different variables such as age, gender, tenure and school type. The sample of the study was 241 voluntary school administrators who were selected conveniently. The thinking styles inventory and a personal data form were used to collect the data. Results showed that the most preferred thinking styles were hierarchical, legislative, and external; whereas the least preferred ones were conservative, oligarchic and local thinking styles. Significant differences across the independent variables of the study were found.

Zhang (2008) examined relationship between emotions and thinking styles of students. The results indicated thinking styles were associated with emotions and also thinking styles had predictive power for emotions beyond age. Type 1 styles were found to be positively associated with the ability to deal with emotions. The researchers concluded that depression was positively predicted by hierarchical style and negatively predicted by anarchic style.

Kao et al (2007) identified the effects of thinking levels on the internet search habits of users in order to improve search engine architecture. Findings showed that high global thinkers search for every possible issue

while high local thinkers focus on a topic, look for explicit answers and explore that topic in detail.

Zhang (2006) analyzed relationship between thinking styles and personality. The thinking style inventory by Sternberg and Wagner were administered to 199 parents of secondary school students in mainland China. Findings showed significant relationship of individual style with personality. In addition, results supported Sternberg's assertion regarding the validity of the theory of mental self government in both academic and non academic settings.

Balkis and Isiker (2005) studied sample of undergraduate students to investigate the relation between thinking styles and personality types and the effect of gender and major field of study on thinking styles. They concluded that thinking styles and personality type's correlates and gender variations in thinking styles were also related.

Fjell et al (2004) investigated Sternberg Wagner thinking style inventory with regard to cross cultural replication and in relation to the five factor personality model. The inventory was administered to the 107 participants from USA and 114 participants from Norway. Inter correlations between the two were not very strong, few exceeding 0.40 and the correlations were in predicted directions.

Abdullah et al (2002) conducted study to determine which thinking modes were the most or least preferable among group of students. The sample consisted of business (n=154) and engineering students (n=90) in their first and second year. Hermann's brain dominance instrument was used. Analysis of results indicated that their preferred thinking mode were analytical, rational and logical; whereas no preference of thinking mode was found among quadrant C learners.

De Boer and Berg (2001) examined learning styles and distributions for the four quadrants of brain based on Hermann's model. The sample included 68 students enrolled in a bacteriology course in the first semester at the University of Pretoria. Hermann's brain dominance instrument was used to identify their styles. Results from the data analysis indicated that the students were equally assigned to the four (A, B, C, D) learning styles.

Kaufman (2001) correlated study on thinking style and vocational subjects. Sample comprised of student journalists and student creative writers and results found that journalists scored higher on executive thinking than creative writers, whereas creative writers preferred legislative thinking than journalist.

Zhang (2001) studied the relationship between teaching approaches and thinking styles in teaching. A total of 76 in-service teachers from Hong Kong responded to the approaches to teaching inventory. Results from both the zero order correlation analysis and the factorial structural analysis fully supported the relationship between the two. It was concluded that approach and style were two overlapping constructs with different labels. The difference between approach and style were in degree, but not in kind.

Sadler and Smith (1999) conducted study on 130 University students and examined the relationships between cognitive styles and learning approaches. Although results indicated that analysts tended to adopt a deeper approach to learning than did the intuitive and that intuitive exhibited a stronger preference for collaborative approaches than did the analysts. They concluded that the evidence found in the relationship between cognitive styles and learning approaches was not strong and style and approach were independent to each other.

Zhang and Sachs (1997) found that natural science and technology teachers in Hong kong prefer global thinking more frequently than social sciences teachers do. The results of these studies suggested that thinking styles, as defined by Sternberg theory, also could be identified among University students in Hongkong. Results indicated that student's thinking styles were different, depending on such variables as age, sex, college, class, college major and travel experience.

STUDIES RELATED TO THINKING STYLE AND ACADEMIC ACHIEVEMENT

Zhang and Fan (2014) examined the association between student's perceived general learning environments and their thinking styles. 752 undergraduates responded to Thinking style inventory. Results indicated that student's perceived learning environment statistically predicted their thinking styles beyond gender, grade, socio economic status.

Sharma and Sharma (2011) highlighted the relationship of thinking styles with academic achievement of students. The data were collected from 333 students at random studying in Government and private schools of Himachal Pradesh. The data was analysed by using t-test. A significant relationship between judicial thinking style and academic achievement was observed. Moreover, females were found to be disposed more towards the use of executive and judicial thinking styles than their male counterpart.

Golshokooh et al (2009) examined the relationship between thinking styles, achievement and creativity. The sample included University students. The study indicated that legislative, local thinking styles were predictors of creativity and achievement.

Yenice and Karasakaloglu (2008) compared the thinking style profiles of students registered to elementary education department in Adnan

Menderes University. Researchers studied the relationship between academic achievement and thinking styles. The most preferred thinking styles were found to be legislative, executive and judicial whereas least preferred styles were liberal and local. Gender was considered as another variable and both male and females preferred global thinking compared to local thinking but at the same time male were found to think more globally compared to the females.

Fer (2007) conducted a study to determine whether the thinking styles of student teacher differ due to gender, age, educational level, type of University attended and the field of study. The results revealed in terms of gender variable that male students scored higher on the monarchic and conservative styles while females scored high on legislative and hierarchical styles. When age variable was considered, the younger student scored significantly higher on the legislative and liberal styles than older ones did. As the findings of the study was examined in terms of thinking level, males prefer global style to local and males scored higher in global thinking as compared to females. When age was considered, the older students preferred global thinking to local thinking style.

Bulus (2006) conducted a study to determine the thinking styles of students. Sample of 4th year students of University was taken. Hierarchic style was found to be positively related to academic achievement. Bulus also examined the effect of the year at University on thinking styles and stated that 4th year students prefer legislative style more as compared to first year students but prefer external style less than first year. Significant difference between males and females were also found on global, internal and conservative styles.

Imamipour et al (2003) investigated the correlation of thinking styles of the University and high schools students with creativity and achievement. The study indicated that there was a significant relationship of age, grade and achievement with thinking styles. The results also showed that females surpassed males in the use of legislative, executive and judicial styles.

Zhang (2002) studied thinking styles in relation to student's modes of thinking and academic performance. A sample consisting of 212 US University students responded to the thinking styles inventory and styles of learning and thinking. Results from convergent statistical analysis procedures indicated that thinking styles and modes of thinking share common variance in the data. Study found that conservative style positively predicted student's grade point averages, whereas global and liberal styles negatively did so.

Zhang (2001) studied on thinking styles contribution to academic achievement beyond self rated abilities. Participants were 209 University students from Hong Kong and 215 University students from China. Participants responded to the thinking styles inventory based on Sternberg theory of mental self government. Participant's academic achievement scores were also used. Results indicated that individual differences in academic achievement were attributable to thinking style over and above what could be explained by self rated abilities. Academic achievement and thinking styles were related differently in the two groups.

Sternberg and Grigorenko (1997) examined the relationship between thinking style and academic achievement of American gifted children. Study found that the judicial and legislative thinking styles correlated positively to student's success in a variety of academic tasks and executive thinking style tended to correlate negatively to success in these tasks. The

results of the study revealed relationship between judicial style and academic achievement.

Cano Gracia and Hughes (2000) examined a study among University students in Spain to find the relationship of thinking styles to academic achievement. Findings from the study supported the relationship. Study found that higher academic achiever tended to be those who preferred to adhere existing rules and procedures (executive style), preferred to work individually (internal style), preferred not to create, formulate and plan for problem solution (legislative style).

STUDIES RELATED TO LEARNING STYLE, THINKING STYLE AND ACADEMIC ACHIEVEMENT

Negahi et al (2013) investigated the relationship between learning styles and thinking styles with academic self efficacy of English students of Islamic Azad University. Samples of 367 students were selected. Data analysis showed that judicial and legislative thinking style had a significantly positive relationship with academic English lesson self efficacy of students. Study also showed that executive thinking styles and academic self efficacy were negatively related.

Sharma and Neetu (2012) explored learning and thinking style of secondary school students in relation to their academic achievement. The sample was 140 secondary school students and normative survey method was applied for this study. Study found positive and significant relation between learning and thinking styles and academic achievement.

Vengopal and Mridula (2007) studied to examine the hemispheric preferences for information processing and styles of learning and thinking

in children. A sample of 250 students of 8th class which included both boys and girls from five English medium schools were selected. The tool styles of learning and thinking (SOLAT) was administered. Results revealed that there was significant difference in the right and left hemisphere preference for information processing among children and boys who were more right hemispheric oriented in information processing. Significant difference in the styles of learning and thinking and concept preference among right and left hemispheres was also observed with respect to both genders.

Cano Garcia and Hughes (2000) examined whether college students learning and thinking styles were interrelated and if these could predict academic achievement. A total of 210 college students completed two inventories. The results of the canonical correlation analysis revealed presence of a moderate relationship between both types of styles. The results of regression analysis indicated that student's academic achievement was related to student's thinking styles. Students that prefer to work individually were legislative in thinking style and those that had adherence to existing rules and procedures were those who obtained higher academic achievement.

SALIENT DISCUSSION FROM THE REVIEW

Salient discussion from review In order to avoid unnecessary duplication and to provide an insight essential to frame the hypotheses for the objectives outlined in the study, the review of the related study has been accomplished. There is an abundant literature that signifies the importance of learning and thinking styles. Few studies related to learning styles with academic achievement and thinking styles with academic achievement have been carried out across the globe. Also, there are many studies that

correlate intelligence with learning in general way, relating learning and thinking styles with other variables. However, there is little research available on the interrelationship of thinking and learning styles and most of these studies are conducted in abroad. The studies conducted in India in this arena are lamentably inadequate. Without doubt, this void deserves the insistent attention of researchers. This scarcity of studies also manifests the need for further exploration of relationship between learning and thinking styles and academic achievement. Hence, this is an area of great relevance to the work of educators. It is pertinent for them to know the influence of styles on pupil's academic achievement and from the generated information, it is necessary to design possible means of intervention for promoting effective learning, thinking and academic achievement.

CHAPTER-III

RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

Plan and procedure of the Study The best way to systematically investigate the research problem is Research methodology. It gives various steps to conduct the research in a systematic and logical way, which is empirical and replaceable. It is essential to define the problem and state the objectives and hypotheses, clearly at the onset. The research design provides the details regarding what, where, when, how much and by what means concerning inquiry.

The present chapter provides a blue-print of research design and describes the following components of investigation:

- Method of the study
- Population
- Sample of the study
- Variables involved
- Tools employed
- Data collection
- Statistical techniques used

METHOD OF THE STUDY

The present study is concerned with present conditions, situations, events and practices and deals with relationship among variables, so it uses description survey method.

POPULATION

The main purpose of the research is to discover principles that have universal application for the whole population, but to study a whole population to arrive at generalization is impracticable and impossible. Sometimes population under study is so large that their characteristics cannot be measured, before the measurement could be completed the population could have changed. During recent years sampling has been increasingly used in research to ascertain information necessary in responding certain questions about a specific population. It has been reported that even if a small representative sample can be drawn from entire population, then the parameters are easily represented and estimated by the sample states, the sample becomes representative of whole population. Johnson (1961) defines "A representative sample is one in which the measurements made on its units are equivalent to those which would be obtained by measuring all the elements of the population except for the inaccuracy due to limited size of sample." In the present study all the secondary school students of North Delhi comprised the population of the study.

SAMPLE OF THE STUDY

A sample refers to the sub-groups of the larger population under study from which inferences are drawn about the larger population. The study aims to define the Academic Achievement of students of class 11^{th} studying in the schools of North Delhi and its relationship with learning and thinking styles.

DATA COLLECTION

In the present study, was collected from 20 secondary schools of Rohtak Distt. Simple random sampling method was used to select the subjects from

(all the schools of Rohtak) population, based on the considerations of school principals' permission for conducting the research study. 20 schools were selected randomly. Further four hundred students (200 male and 200 Female) were selected from those schools on random basis. The sample distribution has been given in the table below:

DESCRIPTION OF SAMPLE

TABLE

SL.NO.	NAME OF SCHOOLS	NO.OF STUDENTS	MALE	FEMALE
1.	GANGA INTERNATIONAL SCHOOL	20	10	10
2.	CAMBRIDGE INTERNATIONAL SCHOOL	20	10	10
3.	DELHI PUBLIC SCHOOL BAHADURGARH	20	10	10
4.	PARAMOUNT SENIOR SECONDARY SCHOOL	20	10	10
5.	NAV JYOTI SENIOR SECONDARY SCHOOL	20	10	10
	TOTAL	100	50	50

DELIMITATION

- The geographical area of the study was delimited to secondary/sr. secondary schools of North Delhi in Delhi.
- Only 100 students studying in Class XI were selected on random basis, equal number of boys and girls, urban and rural was taken into consideration

VARIABLES

In this research, the relationship between independent and dependent variables have been studied.

Dependent Variables:

Academic achievement

Independent Variable:

Learning and Thinking styles

Tools Used:

Following tools were used to collect the data:

- Styles of Learning and Thinking (SALOT) by- D. Venkataraman
- Academic Achievement score by their performance in 10th class.

DISCRIPTION OF THE TOOLS:

- **Styles of Learning and Thinking**

The initial version of style of learning and thinking (SALOT) tool was intended for school children from eighth standard and up to college students and consisted of 100 items passed upon accumulated research findings concerning the specialized functions of the left and right hemispheres. Each item provided the respondent with three choice- one representing a specialized function of the left cerebral hemisphere, the second representing a parallel specialized function of the right hemisphere and the third is checking of both the items representing the integration of right and left hemisphere functions. Test takes asked to indicate which of

the three specific styles of thinking or learning best described about their own typical behaviour.

- **Answer Key or Scoring**

SALOT has inbuilt scoring key which makes scoring easy. Count the number of first serials as “R” (Right) and the number of second item of the serial as “L” (Left). If both the items are checked count it is as “I”. There is no need to count if the items are not checked. In the tool, the first item indicates right hemisphere, the second item indicates left hemisphere and checking of both the items indicate integrated hemisphere.

SALOT Concepts

Learning Styles

Item No.	Right Hemisphere	Left Hemisphere
	Concept: Verbal	
1.	Understanding movements of action	Understanding verbal explanations
2.	Talking while reading or writing	Getting things quit while studying or reading
3.	Learn best by instruction which uses visual presentations	Learn best of instruction which uses verbal
4.	Likes to draw more pictures	Likes to talk and write
5.	Expression of feelings through music, dance and poetry	Expression of feelings and thoughts through plain language
	Concept: Contact Preference	
6.	Interest in soft sciences	Interest in hard sciences
7.	Open ended solution	Structured lessons
8.	Likes to learn through main ideas/basic concepts	Likes to learn through details and specific facts

9.	Writing/likes fiction	Writing non-fiction
10.	Learning through exploration	Learning through examine
	Concept: Class Preference	
11.	Get clarity while learning experimentally	Get clarity through logical reasoning
12.	Learning everything be synthesizing	Understand better while learning critically and analytically
13.	Likes concrete	Likes to learn in abstract way
14.	Slow acquisition of habits	Fast acquisition of habits
15.	Not well-rounded play-fullness	Interested in games and sports.
	Concept: Learning Preference	
16.	Divergent	Convergent
17.	Concentrate with several things simultaneously	Concentrate with one thing at a time
18.	Competitive	Individuality
19.	Unsocial, mysterious	Social, Active
20.	Greater tolerance and adjustment	No tolerance tendency
	Concept: Interest	
21.	Invent something new and imaginative	Improve upon something
22.	Likes to solve complex problems	Likes to solve simple problems
23.	Artistic and aesthetic interest	Temporal interest
24.	More specialize in males	Specialized in females
25.	Interested in funny things	Not interested
	Thinking Style	
	Concept: Logical/Fractional	
26.	Holistic approach	Fractional approach
27.	Recall facts	Recall names
28.	Relation in recalling shapes and figures	Retention and recalling numerical figures
29.	A good command over total memory and tonal	Analyzing speech and sound qualities

30.	Organizing capacity to show the analogical	Sequence of ideas analogical relationship
	Concept: Divergent/Convergent	
31.	Deductive learning	Inductive learning
32.	Independent thinking	Mentally receptive and responsive to what hear and say
33.	Deep thinking while lying down	Deep thinking while sitting erect
34.	Easily find directions in strange surroundings	Easily find directions in familiar places
35.	Likes to make guesses	Not interested in guesses
	Concept: Creative	
36.	Creative thinking	Intellectuality
37.	Like to pre-plan	Likes to day dream
38.	Intuitive	Intellectuality
39.	Judgments through feelings and experience	Logical approach in judgment
40.	Playful approach in problem solving	Businesslike approach
	Concept: Problem Solving	
41.	Absent mindedness	Never be absent minded
42.	Optimistic view	Pessimistic view
43.	Absence of repression and suppression	Presence of repression and suppression
44.	Passive	Aggressive / shoot tempered
45.	Stronger determination and ambition	General
	Concept: Imagination	
46.	A strong memory and remembrance over images	Remembering about languages and pictures
47.	Able to do though experiments	Possesses rational learning and analytical
48.	Hepatic and tactile perception	Lacks hepatic or tactile perception
49.	Imagine and summarize	Outline

50.	Imaginary	Analysis

- **Scoring Procedure:** In the tool against serial numbers 1 to 50, checking of the first items indicates right hemisphere; second items indicate left hemisphere and checking of both the items indicate integrated hemisphere or whole brain. The hemisphericity dominance is determined on the basis of the highest score in three categories of dominance, as far as a group testing or score is concerned.
- **Reliability of the Tool:** The reliability co-efficient of correlation for the right hemisphere function was found to be. 89. For the left hemisphere function co-efficient of correlation was found to be .65. the co-efficient of correlation for the integrated score was .71. This co- efficient suggest that the SOLAT possesses reliability to a significant level.
- **Validity:** Validity of the tool was established on the sustained experts opinion from the professions and doctors connected in the field psychology, and Neurosurgery respectively.

CHAPTER-IV

ANALYSIS AND INTERPRETATION

ANALYSIS AND INTERPRETATION

The raw data gathered on certain tests have no meaning or use without a definite desired shape given by the investigator. Hence after collecting the data this must be processed and analyzed to draw proper interference. The investigator analyzed the collected data as it was difficult to explain the raw data. According to the objectives of the study and their corresponding hypotheses, the data were statistically processed using appropriate design and technique. Statistics is a good tool in the hands of a researcher. It can help in attaining some objectives only if one is clear about the theoretical basis of the variables and their comparison or relationships, so it is necessary to interpret the result obtained statistically. It is only then one can give meaning and direction to research.

According to Good, Barr and Scates (1941), "The process of interpretation is essentially, one of stating what the result show? What they mean? What is their significance ? What is answer of the original problem?" That is all the limitations of the data must enter into and become the part of interpretation of the result. Thus, the analysis of data means studying the tabulated material in order to determine inherent factors into simpler parts and putting the parts together in new arrangement for the purpose of interpretation. As it is of much importance to get a sum correctly solved. It is also equally important to interpret it correctly. Interpretation is most important step in the total research process. It calls for a critical examination of the results of one's analysis in the light of all limitations of data gathered.

In the present study this chapter proposes to investigate the significance of differences and relationship in academic achievement of Learning &

Thinking Style among students under study. Keeping the objectives of the investigation in view, the obtained data were analyzed employing appropriate statistical techniques.

OBJECTIVE-1

To study academic-achievement of secondary school students of North Delhi

TABLE- 1

Mean and Standard Deviation Score of Academic Achievement

VARIABLE	N	MEAN	S.D
ACADEMIC ACHIEVEMENT	100	86.8125	20.43

In the pursuance of objective-1, to study the academic achievement of senior secondary school students of North Delhi, above mentioned table- 1 presents the results. Mean score of the academic-achievement of the subjects were 86.8125 with Standard Deviation 20.43. Academic achievement of the subjects was found be below average and needs attention.

OBJECTIVE-2

To study the learning and thinking styles of senior secondary school students of North Delhi.

TABLE 2

Mean and Standard Deviation Score of Learning and Thinking Style

VARIABLE	N	MEAN			S.D		
LEARNING AND THINKING STYLE	100	R	L	W	R	L	W
		2.69	3.08	5.97	1.47	1.37	3.27

In the pursuance of objective-2, to study the Learning and Thinking Styles of senior secondary school students of North Delhi, above mentioned table-2 presents the results. Mean score of the Hemispheric dominance of the subjects are 2.69 (Right Brain Users), 3.08 (Left Brain Users) and 2.98(Whole Brain Users) with Standard Deviation 1.47, 1.37 and 3.27. It was found that most of the subjects were left brain users in this sample and then whole brain users. Right brain users were less in number in the present study.

OBJECTIVE-3

To study the relationship between academic-achievement and learning and thinking style of secondary school students of North Delhi.

Hypothesis

"There is no significant relationship between academic-achievement and learning and thinking style of secondary school students of North Delhi"

TABLE-3

Relationship between Academic-Achievement and Learning and Thinking Style of Senior Secondary School students of North Delhi

VARIABLE	N	R		
ACADEMIC ACHIEVEMENT		L	R	W
LEARNING AND THINKING STYLE	100	.01NS	.00NS	.01NS

NS not significant at level of significance

In the pursuance of objective-3, to study the relationship between academic-achievement and learning and thinking style of secondary school students of Delhi University, above mentioned table- 3 presents the results. Correlation "r" between Academic-achievement and Learning and Thinking Style is .01 (Right Brain Users), .00 (Left Brain Users) and .01 (Whole Brain Users) which is not significant at level of significance. Hence the hypothesis framed, "There is no significant relationship between academic- achievement and learning and thinking style of secondary school students of North Delhi" is not rejected.

OBJECTIVE-4

To compare Male and Female of Senior Secondary school Students of North Delhi on their Academic-Achievement.

Hypothesis

"There is no significant difference between male and female secondary school students of North Delhi on their academic-achievement"

TABLE-4

Mean, Standard Deviation and't' scores of male and female secondary school students of North Delhi on their academic-achievement.

Academic Achievement	N	MEAN	S.D	't'
MALE	50	85.095	24.037	1.15*
FEMALE	50	88.53	15.907	

*Significant at the 0.05 level.

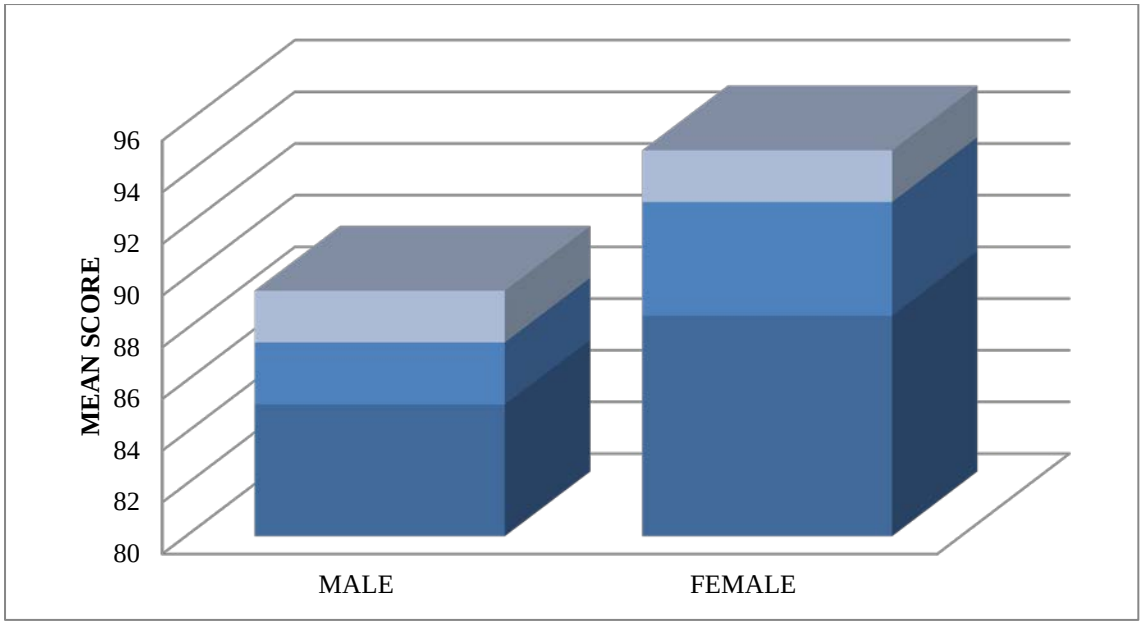


Fig. 1 Mean scores of male and female senior secondary school students of North Delhi on their Academic-Achievement

In the pursuance of objective- 4, to compare male and female senior secondary school students of North Delhi on their academic-achievement, above table- 4 presents the Mean score of male and female subjects. Mean score of male subjects on academic-achievement is 85.095 with Standard Deviation 24.037. Mean score of female subjects on academic-achievement is 88.53 with Standard Deviation 15.907. Difference of Mean score (t) is 1.15 which is significant at .05 level of significance. So, the hypothesis "There is no significant difference between male and female secondary school students of North Delhi on their academic-achievement" cannot be accepted**.**

OBJECTIVE- 5

To compare Male and Female of Senior Secondary School students of North Delhi on their Learning and Thinking Style.

Hypothesis

"There is no significant difference between male and female secondary school students of North Delhi

TABLE- 5

Mean, Standard Deviation and 't' scores of male and female secondary school students of North Delhi on their on their learning and thinking style

LEARNING AND THINKING STYLE	N	MEAN			S.D			't'		
HEMISPHERIC DOMINANCE		R	L	W	R	L	W	R	L	W
MALE	50	2.58	3.17	2.92	1.33	1.32	1.06	3.02**	2.75**	0.61NS
FEMALE	50	2.80	2.98	3.00	1.57	1.40	1.51			

**Significant at 0.01of significance NS= Not significant

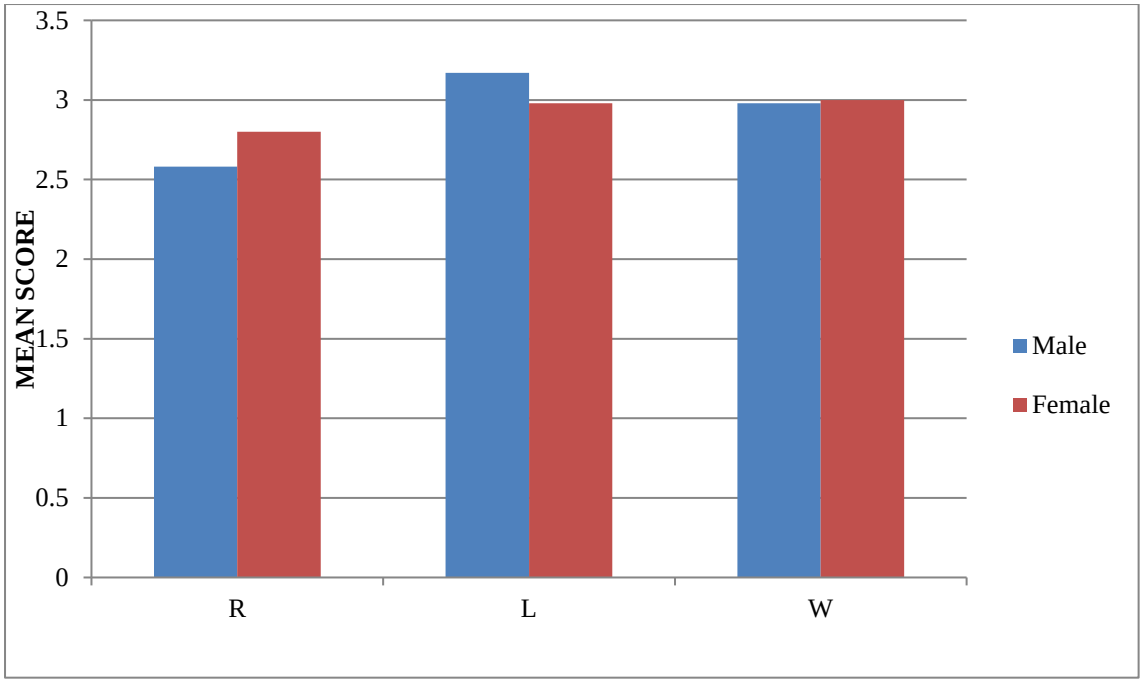


Fig. 2 Mean scores of male and female senior secondary school students of Delhi University, North Delhi on their on their learning and thinking style.

In the pursuance of objective -9, to compare male and female secondary school students of Delhi University, North Delhion their learning and thinking style, above mentioned table- 5 presents the results. Mean score of theHemispheric dominance of the male subjects are 2.58 (Right Brain Users), 3.17(Left Brain Users) and 2.92 (Whole Brain Users) with Standard Deviation 1.33, 1.32 and 1.06 respectively. Mean score of the Hemispheric dominance of the female subjects are 2.80 (Right Brain Users), 2.98 (Left Brain Users) and 3.00 (Whole Brain Users) with Standard Deviation 1.57, 1.40 and 1.51 respectively. 't' score between both of the Mean scores are 3.02 (Right Brain Users), 2.75 (Left Brain Users) and 0.61 (Whole Brain Users) respectively. Difference between Mean Score of male and female subjects on their Learning and Thinking Style", is rejected for Right Brain users and left Brain users at 0.01 level of significance, female students were found more in right brain users, while male students were found more in

left brain users, but there is no significant difference between male and female subjects on the score of whole brain users. So, hypothesis framed for the objective "There is no significant difference between male and female secondary school students of North Delhi on their learning and thinking style, Right Brain users and left Brain users" is rejected on right brain users and left brain users, but accepted in case of whole brain users.

OBJECTIVE-6

To compare urban and rural secondary school students of North Delhi on their Academic-Achievement.

Hypothesis

"There is no significant difference between Urban and Rural of Senior Secondary School Students of North Delhi on their Academic-Achievement"

TABLE-6

Mean, Standard Deviation and't' scores of Urban and Rural secondary school students of North Delhi on their Academic-Achievement

ACADEMIC ACHIEVEMENT	N	MEAN	S.D	't'
URBAN	50	81.685	23.157	1.29**
RURAL	50	91.935	15.74	

Significance at .01 level

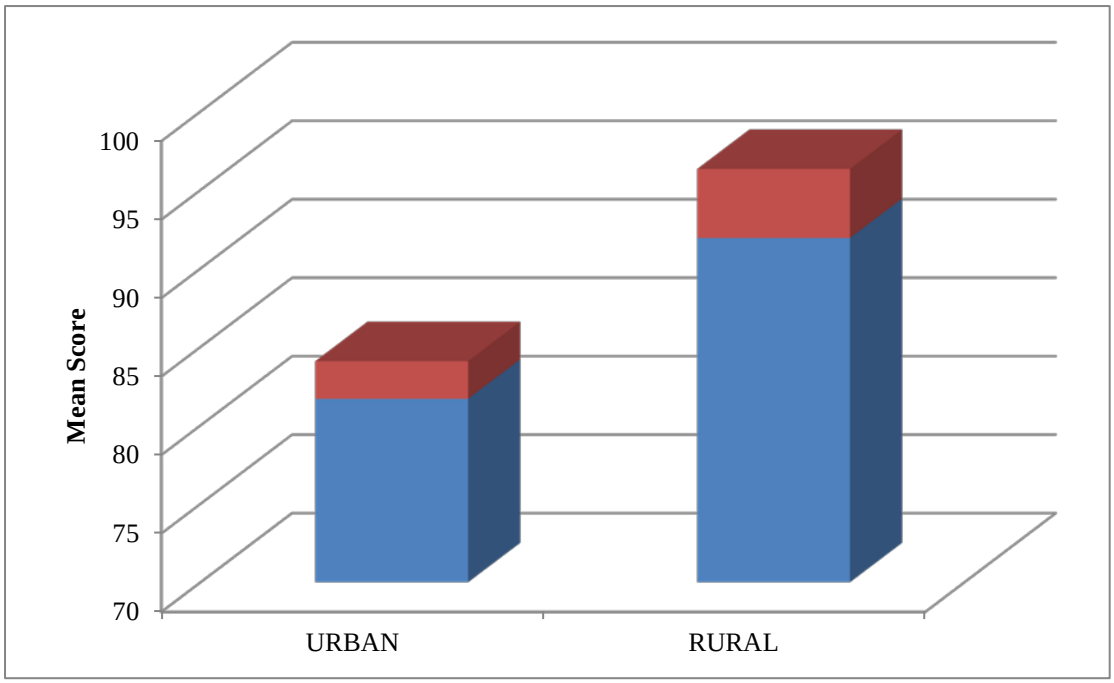


Fig. 3: Mean scores of urban and rural secondary school students of North Delhi on their academic-achievement

In the pursuance of objective- 6, to compare urban and rural secondary school students of North Delhi on their academic-achievement, above table- 6 presents the Mean score of urban and rural subjects. Mean score of urban subjects on academic-achievement is 81.685 with Standard Deviation 23.157. Mean score of rural subjects on academic-achievement is 91.935 with Standard Deviation 15.74. Difference of Mean score (t) is 1.29 which is significant at .01 level of significance. So, the hypothesis "There is no significant difference between urban and rural senior secondary school students of North Delhi on their academic achievement" cannot be accepted. Rural students were found to have more academic achievement than urban students.

OBJECTIVE-7

To compare urban and rural of Senior Secondary School students of North Delhi on their Learning and Thinking style.

Hypothesis

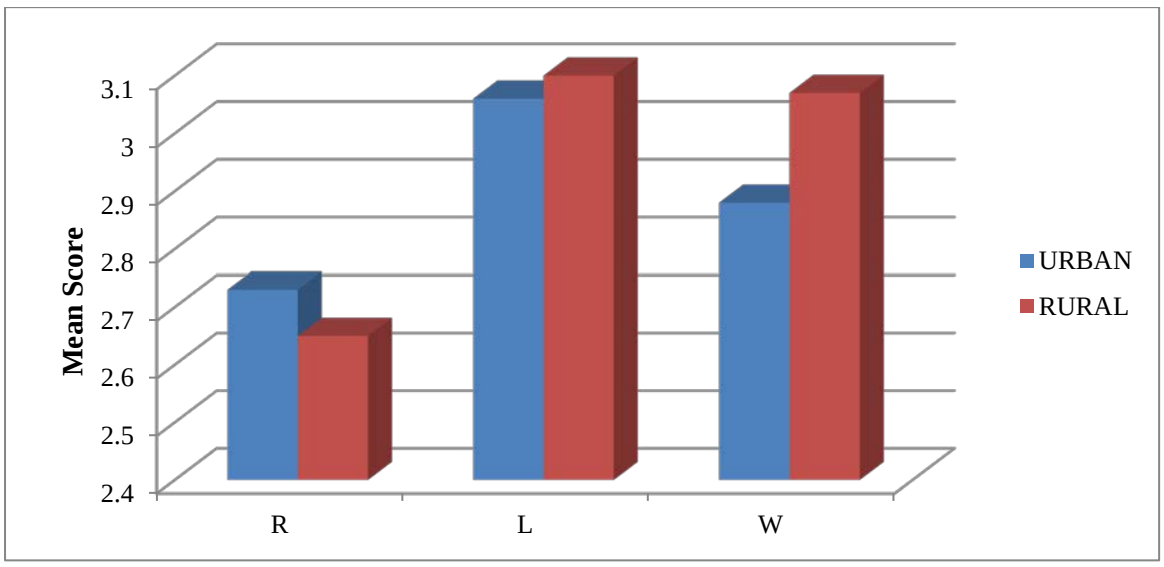
"There is no significant difference between urban and rural secondary school students of North Delhi".

TABLE-7

Mean, Standard Deviation and't' scores of urban and rural of senior secondary school students of Delhi University, North Delhion their learning and thinking style

LEARNING AND THINKING STYLE	N	MEAN			S.D			't'		
		R	L	W	R	L	W			
URBAN	50	2.73	3.06	2.88	1.55	1.42	1.15	3.39**	0.58NS	1.11NS
RURAL	50	2.65	3.1	3.07	1.41	1.32	2.24			

****Significant at .01 level of significance; NS = Not significant**



LEARNING AND THINKING STYLE

Fig. 5: Mean scores of urban and rural secondary school students of North Delhi on their learning and thinking style

In the pursuance of objective-7, to compare urban and rural secondary school students of North Delhi on their learning and thinking style, above mentioned table- 7 presents the results. Mean score of the Hemispheric dominance of the urban subjects are 2.73 (Right Brain Users), 3.06 (Left Brain Users) and 2.88 (Whole Brain Users) with Standard Deviation 1.55, 1.42 and 1.15. Mean score of the Hemispheric dominance of the rural subjects are 2.65 (Right Brain Users), 3.1 (Left Brain Users) and 3.07 (Whole Brain Users) with Standard Deviation 1.41, 1.32 and 2.24. 't' score between both of the Mean score are 3.39 (Right Brain Users), 0.58 (Left Brain Users) and 1.11 (Whole Brain Users) respectively. Difference between Mean Score of urban and rural subjects on their Learning & Thinking Style is not significant at the level of significance on left brain users and whole brain users, but a significant difference was found on right brain users among rural and urban students. Urban students were found to having using right brain than rural students. So, hypothesis framed for the objective "There is no significant difference between urban and rural secondary school students of North Delhi on their learning and thinking style" is partially accepted and partially rejected.

CHAPTER- V

FINDINGS, CONCLUSIONS AND DISCUSSION, EDUCATIONAL IMPLICATIONS AND SUGGESTION FOR THE FURTHER STUDY

FINDINGS, CONCLUSIONS AND DISCUSSION, EDUCATIONAL IMPLICATIONS AND SUGGESTION FOR THE FURTHER STUDY

The present chapter is confined to the main findings of the study based on analysis and interpretation of the data, discussions of the results and most importantly the educational implications. In the end suggestions for the further research is also given.

The discussion, data analysis and their interpretation of the study in the previous chapters would naturally lead one towards a conclusion phase. But it is very difficult to summaries briefly the large amount of data and facts dealing with the academic achievement in relation to learning and thinking style of senior secondary level students as revealed in the present study. Therefore, it directs the investigator to conclude and discuss this main finding in short as far as possible. Though the discussions and main findings have been presented in short yet it has been attempted to present the entire salient findings lest it should miss the charm of the main findings.

In this investigation, the researcher proposed to make a study on the correlation of academic achievement and learning and thinking styles of senior secondary school students. Further comparison of male/female and urban/rural students was made on their academic achievement, learning and thinking style by using Styles of Learning and Thinking (SALOT) by- D. Venkataraman and Academic Achievement score by subjects' performance in 10^{th} class.

The study was conducted on 100 senior secondary school level students studying in secondary/senior secondary schools of North Delhi of Haryana.

FINDINGS:

The findings of the study are as follows:

- Academic Achievement of secondary school students of North Delhi was found to be as follows:-
  - Mean score of the academic-achievement of the subjects were 347.25 with Standard Deviation 81.72.
- Learning and Thinking Style of secondary school students of North Delhi was found to be as follows:-
  - Mean score of the learning and thinking styles of secondary level students of North Delhi, were 23.11 (Right Brain Users), 18.08 (Left Brain Users) and 8.44 (Whole Brain Users) with Standard Deviation 5.8, 4.6 and 7.0.
- Academic-Achievement and Learning and Thinking Styles of secondary level students of North Delhi, were found to be independent variables and thus not correlated with each other. The correlation between the two was not found significant at the level of significance.
- Male and female secondary school students of North Delhi were compared on their academic-achievement. Female subjects lend higher on academic-achievement than their male counterparts. Comparison of Mean score (t) was found to be significant at .05 level of significance. So significant difference between male and female subjects on their academic-achievement was found.
- Male and female secondary school students of North Delhi were compared on their learning and thinking styles. Comparison of

Urban and Rural senior secondary school students of North Delhi was compared on their learning and thinking style. Difference of Mean score (t) was found to be significant at .01 level of significance on Right Brain scores only. It means urban and rural subjects significantly differ on their Right Brain usage (learning and thinking style). No significant difference was found between urban and rural students of secondary level students of North Delhi, on their usage of Left Brain and The Whole Brain scores.

CONCLUSION AND DISCUSSION OF RESULTS

During the past decade, educational research has identified a number of factors that account for some of the differences in how students learn. One of these factors, learning styles, is broadly described as "Cognitive affective and psychological friars that relatively stable indications of how learners perceive, interact with and respond to the learning environment" (Keefe, 1979). Present study was aimed at studying academic-achievement, learning and thinking styles of secondary/senior secondary school students of North Delhi. Further correlation of the independent variables with dependent variable was examined. Academic- achievement and learning and thinking style were found to be independent to each other. Finding of the study is an agreement of Bilal (2010). Further male and female students were compared on their academic-achievement and learning and thinking styles. Learning styles have attained vital importance in our society. Obtained result shows the higher lend of female students on academic-achievement as compared to their male counterparts. A significant difference was found between male and female students on their learning and thinking style except whole brain usage. Findings of Sharma and Neetu (2011) Lavanya (2011), Vengopaland Mridula

(2007) are in consonance with present study. Conclusion can be drawn that male and female students differ significantly on their learning and thinking styles on their usage of Right and Left Brain Female students were found to obtain higher scores on their self-concept. Urban and Rural students of secondary level students of North Delhi were also compared on their academic-achievement and learning and thinking style. It can be concluded on the basis of above findings that there was significant difference between urban and rural students' of secondary level students of Delhi University, North Delhi, on their academic-achievement. Rural students had a higher lend on their academic-achievement than their urban counterparts. Conclusion on their learning and thinking styles can be drawn as per above findings. Urban and Rural students differ on their Right Brain usage only; they did not differ on their usage of Left Brain and Whole Brain.

EDUCATIONAL IMPLICATIONS

The study will help the policy makers and educationists to provide better provisions and opportunities to the students to achieve their goals in all areas of education.

This study examined academic achievement and it's relation with some cognitive (Academic-achievement) and psychological (learning and thinking style). Results support that learning and thinking style does affect students' academic- achievement. Educational institutions must take care of this psychological aspect of the students. For the purpose, schools must provide psychological services. They can include such activities and strategies in their schedule which are helpful in enhancing learning and thinking styles of the students, so they can achieve better. As the results of the study show, male students obtained low scores on

academic-achievement in comparison to female students. Due attention should be paid towards male above findings that there was significant difference between urban and rural students' of secondary level students of North Delhi, on their academic- achievement. Rural students had a higher lend on their academic-achievement than their urban counterparts. Conclusion on their learning and thinking styles can be drawn as per above findings. Urban and Rural students differ on their Right Brain usage only. They did not differ on their usage of Left Brain and Whole Brain.

SUGGESTIONS FOR FURTHER STUDY

Research in any branch of human knowledge never a close the book; there is always a persistent need of finding solution to new problem and testing the veracity of solutions of older problems. Some of the suggestions for the further research in the area are given below:

1. The study can be conducted on a larger sample than selected for the present study which can make the results more reliable.

2. Other than the secondary school group of students any other age group can be taken for the study which shall help to find out the difference of the impact.

3. Any other variable like personality, attitude, intelligence, creativity and aptitude can be selected to see their relationship with Learning and Thinking styles.

4. By applying further inferential statistics like regression analysis, more studies can be conducted to get results in detail.

5. Studies in academic-achievement can be conducted with other variables viz. socio-Economic-factor, Personality, Study Habits etc.

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APPENDIX

APPENDIX

Questionnaire

SOLAT

By D.Venkataraman

NAME _____ AGE _____ SEX _____

CLASS _____ SCHOOL _____ DATE _____

DIRECTION:

Please read the following statement carefully. Each statement has two parts 'a' and 'b', followed by boxes in the end. Put a tick mark in the box whichever statement is true for you. You may tick both the statements in a pair if both are true for you or you may leave both the statements if none of them are true for you.

(NOTE: LEAVE BOTH THE STATEMENTS BLANK ONLY IF IT IS IMPOSSIBLE FOR YOU TO DECIDE)

1. I understand clearly the information passed through by actions. a. ☐

   I understand clearly the information passed through by words. b. ☐

2. I have habit of talking while reading or writing. a. ☐

   I need complete silence while reading or writing. b. ☐

3. I can learn best in the class when the instructor uses visual presentation. a. ☐

   I can learn best in the class when the instructor uses verbal presentation. b. ☐

4. I like to draw pictures. a. ☐

   I like to write and talk. b. ☐

5. I like to express my feeling through dance, drama, poetry and songs. a. ☐

   I like to express my feeling openly in words. b. ☐

6. I like to learn things by handling light tools and electronic items in a laboratory. a. ☐

   I like to learn things by handling machines in industries. b. ☐

7. I like modifications of lessons without planning for learning apart from syllabus. a. ❑

I like planned lessons for learning as per syllabus. b. ❑

8. I like to learn lessons by main ideas. a. ❑

I like to learn lessons by detailed and specific facts. b. ❑

9. I like to write, imaginative stories. a. ❑

I like to write essays and articles. b. ❑

10. I like to learn through exploration. a. ❑

I like to learn through examination. b. ❑

11. I get clarity while learning experimentally. a. ❑

I can learn easily through logical reasoning, without experiment. b. ❑

12. I understand things when a matter is analyzed as a whole. a. ❑

I understand easily when a matter is analyzed in parts. b. ❑

13. I understand lessons easily when taught through examples. a. ❑

I understand lessons easily when taught through concepts or summary. b. ❑

14. I take time to understand and follow habits. a. ❑

I easily understand and follow habits. b. ❑

15. I am not interested in games and sports. a. ❑

I am interested in games and sports. b. ❑

16. I can give various answers in different forms and ways to a particular question. a. ❑

I can give only one answer to a particular question. b. ❑

17. I can concentrate on several to a particular question. a. ❑

I can concentrate on things one by one. b. ❑

18. I like to try to be better than other students. a. ❑

I do not like always trying to be better than other students. b. ❑

19. I like to work by myself. a. ❑

I like to work in a group. b. ❑

20. I can work by myself, by adjusting with other in the class. a. ❑

I cannot adjust or tolerate in the class, which I dislike. b. ❑

21. I like to invent something new in an imaginative way. a. ❑

I like to improve upon the exiting one. b. ❑

22. I like to solve complex problems smoothly. a. ❑

I like to solve simple problems. b. ❑

23. I am interested in artistic and aesthetic works. a. ❑

I am interested in worldly affairs. b. ❑

24. I am interested in knowing activities and characters of men. a. ❑

I am interested in knowing activities and characters of women. b. ❑

25. I am interested in funny things. a. ❑

I am not interested in funny things. b. ❑

26. When I think about a matter I think about it as a whole unit. a. ❑

When I think about a matter I think it in segments and its merits and demerits. b. ❑

27. I can remember my friends through faces rather than their names. a. ❑

I can remember my friends through names rather than their names. b. ❑

28. I can remember and recall shapes and figures. a. ❑

I can remember and recall languages and numerical figures. b. ❑

29. I can identify a person through his voice. a. ❑

I can identify a person through his speech. b. ❑

30. I can organize and express the ideas with examples. a. ❑

I can organize and express in a sequence as they occur. b. ❑

31. I can find out theory through facts and examples. a. ❑

I can find out facts through theory. b. ❑

32. I like to solve problems through independent thinking. a. ❑

I like to solve problems with the opinion of others. b. ❑

33. I think deep while learning down. a. ❑

I think deep while sitting erect. b. ❑

34. I can easily find out directions even in unfamiliar places. a. ❑

I can easily find out directions only in familiar places. b. ❑

35. I like to guess results. a. ❑

I am not interested in guessing results. b. ❑

36. I think creatively to solve problems. a. ❑

I think intellectually to solve problems. b. ❑

37. I like to pre-plan things which I have to do. a. ❑

I like to day-dream things which I have to do. b. ❑

38. I like to solve problems by analyzing the reasons through internal feelings. a. ❑

I like to solve problems by analyzing the reasons through intelligence. b. ❑

39. I judge things through experience and internal inspirations or feelings. a. ❑

I judge things through logical reasons. b. ❑

40. I like to solve problems in a playful way. a. ❑

I like to solve problems in a business like approach. b. ❑

41. I forget things which I have to do. a. ❑

I never forget things which I have to do. b. ❑

42. I hope that everything will be all right. a. ❑

I feel that everything will be a failure. b. ❑

43. I do not have the nature of punishing others, when things go bad for me. a. ❑

I have the nature of punishing others, when things go bad for me. b. ❑

44. I am always peaceful even when facing problems. a. ❑

I get aggressive and angry easily when facing problems. b. ❑

45. I have strong determination and ambition to be successful in every matter. a. ❑

I hope of feel to be successful in every matter. b. ❑

46. I have strong memory and remembrance for images and pictures. a. ❑

I have strong memory and remembrance for voices. b. ❑

47. I can do things by imaginations. a. ☐

I can do things after knowing and analyzing. b. ☐

48. I have the ability to tell the characteristic features of an object by touching. a. ☐

I have no ability to tell the characteristic features of an object by touching. b. ☐

49. I can imagine and summarize matters. a. ☐

I can give out line of matters. b. ☐

50. I can imagine incidents occurred in the past. a. ☐

I can analyze details of incidents occurred in the past. b. ☐

FOR OFFICIAL USE ONLY

SOLAT SCORES

R score	
L score	
W score	
HEMISPHERECITY (Brain dominance)	