CHAPTER - I

INTRODUCTION
The inventive mind with an array of scientific tools can accomplish almost anything within the scope of man's imagination. At the decision-making level, in government, in industry and in all the phases of social life, a vast new pool of resource persons are in demand with the skills, trained intellect, personality, leadership qualities, and integrity to exert national and international leadership. Hence, striving for excellence, is the only alternative with the present society.

Our democratic ideals compel us to seek out and promote the talented and gifted. If talent is systematically discovered, developed, and utilized, society as a whole has certain general responsibilities. The democratic ideal of equal opportunity for all does not mean, that all people should have identical opportunity, rather, it means that all the people should have the opportunity to make the most of whatever abilities they have. It is not sufficient, simply to offer opportunity, but opportunity should be commensurate with ability, that is with high ability, should go greater opportunity. A democratic society should not have a laissez faire policy with respect to the gifted. It should actively seek them out, wherever they are, and attempt to stimulate them to take advantage of the educational opportunities that are available to them.

Thus, the importance of identifying and fully developing the talents of young people, which is important in its own right, quite apart from the economic needs, is reinforced by the imperative of development.

As the year 2000 approaches, there are important advances to anticipate challenging tasks in Gifted Education. On the assumption that it is the right of all children to fulfil their potential, so far as circumstances allow, researchers often find themselves wondering just what to do with the gifted children.

Why are the academically students gifted? What makes them different than the average students? Is it the way they learn or the way they go about the learning process in the cycle of learning in different academic subjects, which makes them academic superior to others. With these queries in mind that the present study was conceived of.

CONCEPTS DEFINED

Giftedness

The history of the gifted education movement has witnessed extensive efforts in both theoretical and empirical areas to define giftedness. An explicit definition of giftedness is considered by many to be a keystone for the development of programs
for the gifted. It is important because of the close link, that must exist between the
definition and the identification system (Ward 1983; Feldhusen, Asher and Hoover,

According to Marland (1971), gifted and talented children are those identified by
professionally qualified persons who by virtue of outstanding abilities are capable of
high performance. These children are those who demonstrated achievement and/or
potential ability in any one of the following areas:

1. General intellectual ability
2. Specific academic aptitude
3. Creative or productive thinking
5. Psychomotor ability.

Renzulli (1982) has asserted that despite the efforts, the precise definition of
giftedness remains a question with no universally accepted answer. He suggests that
many a definition of gifted range along a continuum from "conservative" as
represented by Terman's definition of the top one percent in general intellectual ability,
to the more "liberal" definition of witty (1940), who recommended that the definition of
giftedness is to be expanded to include any child whose performance, in a potentially
valuable time of human activity, is consistently remarkable.

According to Renzullis and Reis (1991), giftedness is present when there is
interaction among above average ability, task commitment, and creativity
(See Figure-1.1). These are the elements of giftedness:

![Fig. 1.1: Elements of giftedness](image)
Heller (1991, 1992), defined giftedness as the individual's cognitive and motivational potential as well as social and cultural conditions of achieving excellent performance in one or more area.

According to Clark (1992), giftedness is the result of appropriate enrichment and stimulation of the interaction between unique genetic pattern and the environment.

Kar (1992) defines, "gifted are those children whose cognitive abilities place them in the upper level of population distribution. They constitute only 3-5 percent of the total population. They have superior cognitive ability, creativeness in thinking and production, and superior talent in special areas".

The published definitions of giftedness may be classified into six categories according to Feldhusen and Jarwan (1993). These categories are:
1. Psychometric Definitions
2. Trait Definitions
3. Definitions Focused on Social Needs
4. Educationally Oriented Definitions
5. Special Talent Definitions
6. Multidimensional Definitions

Psychometric Definitions

Psychometric definitions represent a quantitative approach in viewing giftedness in terms of cut off points on certain criteria such as I.Q. originating from traditional psychometric research (Terman, 1925 and Hollingworth, 1929).

Terman and Hollingworth used intelligence as a basis for defining giftedness and operationally defined intellectual giftedness in terms of a line drawn at a score level on an intelligence scale (Hollingworth 1929; Terman and Oden, 1959).

Hollingworth (1929) also equated giftedness with high levels of intelligence as measured by standardized individual tests. She believed that "a mind must be judged by its product" and "the measurement of performance" is the "only approach to the measurement of mind. She defined intellectually gifted children as the most intelligent 1 percent of the population who are at or above 130 IQ.
Trait Definitions

Trait Definitions are derived from psychological characteristics that are assumed to differentiate gifted children from others. Reynolds and Birch (1977), suggested that, the gifted student is likely to have above average language development; persistence in attacking difficult mental tasks; the ability to generalize and see relationships; unusual curiosity and a wide variety of deep interests.

At least one component of Renzulli's definition (1978), which includes task commitment, is derived from this approach. Unusual curiosity, variety of interests, productive thinking, etc., are among the traits included in these definitions. Several of these characteristics may be viewed as traits.

Definitions Focused on Social Needs

This category refers to definitions that are based on social needs (Newland, 1976). Researches have concluded that "giftedness is societally defined" (Kirk and Gallagher, 1983; Sternberg and Davidson, 1985).

In a comprehensive historical review of public concern for the gifted during the period from 1950 to the present, Tannenbaum (1986) concluded that statistics of supply and demand in key professions, especially in science and technology, and racial balance were major factors in determining the direction and extent of concern about gifted education at all levels.

Educationally Oriented Definitions

Educational definitions focus on specific qualities of education or schooling that are important for the gifted.

Gallagher's definition (1975), for example, states that the gifted are the children who require differentiated educational programme and services beyond those normally provided by the regular school program in order to realize their contributions to self and society.

Special Talent Definitions

- The term talented generally refer to students who are outstanding in a specific skill, such as arts, music, mathematics, science, on any other aesthetic or academic area (Davis & Rimm, 1985). The emphasis on the talent category is on particular aptitudes. (von Ardenne, 1990; Balogh and Nagy, 1990; Howe and Sloboda, 1991).
Multidimensional Definitions

This category refers to recent definitions that integrate several factors and include more detail. Renzulli’s conceptual definition (1986) may be classified under the multidimensional, educational category.

Gifted behaviour reflects an interaction among three basic clusters of human traits. These clusters being above average, general and/or specific abilities, high levels of task commitment, and high levels of creativity.

Feldhusen and Hoover (1986) also presented a multidimensional conceptualization of giftedness as an interaction of superior general abilities (intelligence), focused talents, and a special conception of self.

Feldhusen (1986a) also stressed the role of knowledge base, acquired through educational experiences, as another fundamental component of emerging giftedness.

Differences Among the Definitions

The definitions of giftedness differ in at least four fundamental ways:

Degree of comprehensiveness or breadth

This dimension refers to the nature and number or variables included in the definition. At one extreme are definitions with a single variable and domain such as mathematical aptitude or creativity. At the other extreme are multivariate definitions that include a wide range of traits in addition to cognitive variables.

Degree of superiority

This dimension ranges from conservative definition such as Terman’s top one percent level in general ability as measured by the Stanford-Binet Intelligence Test to liberal definitions, such as, the multiple talent viewpoint of Taylor, Allington, and Lloyd (1990), that considers almost every one to be gifted or talented in some way.

Gifted versus potentially gifted focus

This dimension refers to an important aspect of the conceptualization of giftedness in terms of the extent to which definitions involve a static or dynamic view of components or characteristics of giftedness. According to Hoge (1989), the continuum ranges from definitions based on 1Q tests to definition that involve a set of potentialities that may or may not be developed.
Terminology of giftedness

A variety of terms have been used in defining the giftedness. Some use the term "giftedness" and "talent" synonymously, some distinguish between them, while others associate them with the term "creativity".

On the basis of the above review of the various shades of meaning of giftedness, in the present study, "giftedness" is understood and used as a potential ability in a person as demonstrating in his/her scholastic achievement and superior intellectual ability. This meaning fits in the category of psychometric definitions of giftedness.

Characteristics of the Gifted

The following distinguish characteristics of gifted can be checked in area of intellectual ability:

♦ Leams rapidly and easily
♦ Uses a lot of common sense and practical knowledge
♦ Reasons things out, thinks clearly, recognizes relationships, comprehends meanings
♦ Retains what he has heard or read without much rote drill
♦ Knows about many things of which other children are unaware
♦ Uses a large number of words easily and accurately
♦ Can read books that are one to two years in advance of the rest of the class
♦ Performs difficult mental tasks
♦ Asks many questions. Is interested in a wide range of things
♦ Does some academic work one or two years in advance of the class
♦ Is original, uses good but unusual methods or ideas
♦ Is alert, keenly observant, responds quickly.

Special Education Needs of the Gifted

The characteristics of the gifted lead to a set of special educational needs. Van-Tassel (1979) proposed the following list of special educational needs of gifted children:

♦ Challenged to operate cognitively and affectively at complex levels of thought and feeling
♦ Opportunities for divergent production
♦ Work that demonstrates process/product outcomes;
♦ Discussions with intellectual peers;
Experiences that promote understanding of human value system;

Special course that accelerate pace and depth;

The opportunity to see interrelationships in all bodies of knowledge;

To apply abilities to real problems;

Exposure to new areas of learning;

Critical thinking, creative thinking, research, problem solving, coping with exceptionality, decision-making, and leadership.

IDENTIFICATION OF INTELLECTUAL GIFTEDNESS

Identification of the gifted has become more complex and difficult, as the focus of attention moves beyond traditional IQ definition of giftedness to broader perspectives, which views giftedness as a multifaceted process (Heller, 1991; Necka, 1991) including many talents and aptitudes as well as general ability (Feldhusen, 1986a, 1986b; Gardner, 1983; Getzels and Jackson, 1958; Guilford, 1967; Marland, 1971; Silverman, 1986 Treffinger and Renzulli, 1986; Tyerman, 1986; Wallace and Pierce 1992).

In India, the NCERT launched a scheme of 'NTS' in 1963 which later became National Talent Search Scheme (NTSS) in 1977. It used Scholastic Aptitude Test, test of Mental Ability and interview for selecting talented students.

National Report of identification (Richert et al., 1982)suggested following six principles for identification of gifted:

a) Defensibility: Procedures should be based on the best available research and recommendations.

b) Advocacy: Identification should be designated in the best interests of all students. Students should not be harmed by procedures.

c) Equity: Procedures should guarantee that no one is overlooked. The civil rights of students should be protected, and cut off scores should be avoided, since they are the most common way that disadvantaged students are discriminated against.

d) Pluralism: The broadest defensible definition of giftedness should be avoided.

e) Comprehensiveness: As many gifted learners as possible should be identified and served.
f) **Pragmatism:** Whatever possible, procedures should allow for the modification and use of instruments and resources in hand.

In view of Feldhusen, Asher, and Hoover (1984), a sound identification process includes five major steps, each of which must be viewed separately in order to determine its validity within the framework of the entire process. They identify these steps as:

- The clarifications of the goals of the identification process and the program, including the types of youth to be served.
- The application of a nomination-screening process that uses appropriate and psychometrically sound measures.
- The use of assessment procedures that reduce the number of youth to be served and that "yield diagnostic information about the students' special talents, aptitudes, abilities, strengths, weaknesses" and needs.
- The differentiation of individuals for the differentiation of education.
- The validation of the identification process through correlation of the measures used with criteria of success in the gifted programme.

Sinha (1993) stated a more sophisticated approach to detect talent/gifted. It relies on various kinds of standardized intellectual, aptitude and achievement tests, which in turn, are supplemented by teachers' observation.

A Delphi study of 29 experts (Cramer, 1991) in the education of the gifted drew attention to six issues as top priorities in this field:

(a) Curriculum for the gifted
(b) Procedures for identifying gifted children
(c) Selection and training of teachers of the gifted.
(d) Working with special populations of gifted
(e) Ascertaining goals of programmes for the gifted
(f) Defining the term "gifted".

In the present research, the gifted students were identified with the help of:


3. Academic achievement: average scores of two consecutive annual examinations in previous classes. in three different subjects.

OPERATIONAL DEFINITIONS

There are diverse conceptualization of giftedness, since there is no one accepted definition of giftedness, it has prompted the researcher to formulate operational definition of giftedness.

"Intellectually gifted are those who rank at or above 90th percentile on the test of intelligents."

INTELLIGENCE

Psychologists have been generous to a fault to their definitions of intelligence. Philosophers have pondered over it, teachers have evaluated it in their pupils and the man on the street has assumed without question that he knows what it is. Inspite of its wide and common current usage and ancient roots, intelligence is relatively a recent concept in psychology. Almost every writer on the subject has put forward his own definition and some in the fullness of time, have offered even more than one. It is true that some of the apparent disagreements are mainly verbal but many of them reflect fundamental differences of opinion concerning the concept of intelligence. The fact that intelligence is a concept rather than a power or a thing that can be observed causes difficulty when a definition of it is attempted and leads to a great variety of interpretation.

Dictionary meaning of intelligence centres around understanding or reasoning, taking effective action in new situation and acquiring and utilizing appropriate information.

Thorndike in 1926 recognized that, intelligence is given meaning only by its observable consequences or as he expressed it, by its "products". The "products" of intelligence are the tasks an individual is able to complete. The difficulty level of the task completed indicates the person's intellectual level. Thorndike, therefore, envisaged as many different types of intelligence as there are different types of tasks.

A more comprehensive and perhaps appropriate description, given by Garrett (1949) is that Intelligence includes at least the abilities demanded in the solution of problems which require the comprehension and use of symbols.
Piaget (1950) has defined intelligence from a different angle. According to him "Intelligence constitutes the state of equilibrium towards which tend all the successive adaptations of a sensory motor and cognitive nature, as well as all assimilatory and accomodatory interactions between the organism and the environment. Piagets General theory is in the category of cognitive psychology, but he pays so much attention to sensory motor activity, at least in the young child, that he almost qualifies as a behaviorist.

Wechsler (1958) proposes as a definition when he says that Intelligence, operationally defined, is the aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively to his environment. Although intelligence is not a mere sum of intellectual abilities, the only way we can evaluate it quantitatively is by the measurement of the various aspect of these abilities, says Wechsler (1958). He concluded that general intelligence is not a unique entity but a complex constellation of inter acting factors.

Drever (1958) defines intelligence as the ability to perform tests or task, involving the grasping of relationship. The degree of intelligence being proportional to the complexity or the abstractness or both of the relationship.

For Guilford (1967) however, intelligence is contained in four words: comprehension, invention, direction and criticism". He continuously revised his definition of the nature of intelligence and finally characterized intelligence as: inventiveness dependent upto comprehension and marked by purposefulness and creative judgment. Thus, we see that intelligence is not a simple entity.

In the present study, intelligence is taken as general mental ability, as measure by Raven's Standard Progressive Matrices and Jalota's General Mental Ability Test.

**Relationship between Intelligence and Academic Achievement**

Academic achievement is dependent on a number of cognitive factors like intelligence and creativity, or non cognitive factors like personality variables, adjustment, study-habits, socio-economic status etc. Many scientific researches in the past have shown and given a considerate weight to intelligence as a major influencing factor in the domain of academic achievement.

Gill and Spilka (1962) in their study found that over achievers appear to be both more intellectually efficient and socially more mature than their under achieving classmates. The achiever wins good grades.
Lalithamma (1965) in her study on achievement of secondary pupils in mathematics, found that the achievement in mathematics was positively correlated with intelligence.

Sinha (1967) found that intelligence and academic achievement were significantly related.

Harries (1968) and Vernon (1970) have also reported that intelligence influences the academic achievement of the children to a great extent.

Joshi (1970) found that higher intelligence is positively associated with higher scores on the algebraic concepts.

Bhushan (1973) in his study revealed that the post-test scores, were significantly correlated with intelligence.

Mohan (1975) reported that intelligence as measured by progressive matrices was positively related with total educational attainment.

Sodhi (1977) found that intelligence acted as a redundant variable so far as overall achievement in taxonomic categories is concerned.

Sansanwal (1978) found that, the mean achievement score of students belonging to high intelligence group was significantly higher than that of average and low intelligence group students. And also that the mean achievement of average intelligence students was significantly higher than that of low intelligence group.

Mehrotra (1986) also found that a positive relationship existed between intelligence and academic achievement.

Russo (1989) in his comparative study of creativity and cognitive problem solving strategies of bright and average students found, that there were no significant differences as such between P-S strategy of bright and average children. He concluded that not I.Q. but P.S. and creativity underlie the creative achievement.

The interplay of intelligence and achievement as reflected in the studies quoted above are quite conclusive towards the positive relationship between the two.

ACADEMIC ACHIEVEMENT

Academic achievement is important, as it helps the students to understand the hierarchy based on academic achievement i.e. higher the achievement more are the openings for the students and, they can go for better lines and better jobs in all fields like science and technology, medicine, management, literature, education etc.
Higher scholastic achievement is of paramount importance for progress and promotion in any field. As students with higher level of achievement can have a better chance to get higher level of jobs, and the type of work that is given to them provides still better chance of their growth in the professional field.

Another important role that academic achievement plays is the elevation of the socio-economic status of the individual, as well as, the family because of the higher/better occupational opportunities.

Academic achievement is also an indicator of the level of intelligence and the effectiveness of the teachers, as well as, the overall effectiveness of any institution. The world is becoming more and more competitive, and the quality of performance has become the key factor for personal progress. Parents desire, that their children climb the ladder of performance as high as possible. This desire for a high level of achievement shapes their attitude, towards the educational system.

In fact, it appears as if, the whole system of education revolves round the academic achievement of student, though various other outcomes are also expected from the system. Thus a lot of time and effort of the schools are used for helping students to achieve better in their scholastic endeavours.

Trow (1956) defined academic achievement as "the attained ability of degree of competence in school tasks, usually measured by standardized tests and expressed in grades or units based on norms derived from a wide sampling of pupils performance".

Good (1959) stated academic achievement, as the knowledge attained or skill developed in the school subjects usually designated by test scores or marks assigned by the teacher.

According to Crow and Crow (1969) achievement is the extent to which learner is profiting from instruction in a given area of learning.

Horrock (1969) pointed out that achievement is the status or level of person's skill, the range and depth of his knowledge or his proficiency in a designated area of learning or behaviour.

Mehta (1969) pointed that the word 'performance' is a wider term, which includes both the academic and co-curricular performance of an individual.

According to Christian (1980) it indicates the learning outcome of the students, which affects three major areas of student behaviour viz.:
i. Cognitive (Intellectual development, Recall and Recognition).
ii. Affective (Self-concept, Personal growth).
iii. Psychomotor (developing of muscular skill).

In other words, academic achievement refers to the attainment of the pupils in the so-called academic subject, as reading, writing, arithmetic, science and history, as contrasted with, skill developed in such areas as industrial and physical education. Thus, there are various aspects of the concept of academic achievement which have a great bearing on the personality of a student. From an early age, a sense of achievement is a source of good feeling and self-esteem; and failure a source of anger and self reproach.

Operational Definition of Academic Achievement

The term Academic Achievement in this study have been used as a measure of knowledge and understanding of skills in a specified subject or group of subjects, which is the outcome of learning experiences that students have in educational places.

Factors Affecting Academic Achievement

Academic achievement is considered as the unique responsibility of educational institutions. Knowledge of significant and non significant correlation between the different factors and academic achievement is therefore, necessary for a teacher in asserting the cause of high and low achievement. It will consequently help in promoting achievement of students, which is of a great concern to the parents, teachers, the institutions and the society. In fact, the future of any institution depends on the academic achievement of its students. However, it can be generalized that different factors affecting the academic achievement can be categorised two broad categories, viz. personal and social factors.

Personal Factors

These are the factors pertaining to self of the individuals. These included cognitive and non cognitive factors, as described here:

Cognitive Factors
♦ Intelligence
♦ Motivation
♦ Creativity
♦ Learning capacity
Non-cognitive Factors
♦ Aptitude
♦ Level of aspiration
♦ Physical and mental health
♦ Self-concept of the learner
♦ Heredity
♦ Locus of Control

Social Factors
♦ Home environment/family environment
♦ Community
♦ School environment
♦ Classroom environment
♦ Friends
♦ Socio-economic status

These factors effect the academic achievement both positively as well as adversely.

In the present study, the investigator decided to take some of the variables which affect giftedness. These are: learning style from among cognitive factors and locus of control from non-cognitive factors.

LEARNING STYLES

In recent years, there has been a proliferation of research on learning styles of students at various levels of education, which are employed to illustrate the application of rigorous qualitative analysis in investigating the actual tasks undertaken by students, in the areas of higher learning, leading to the description of qualitative differences in learning outcomes. These are related to different learning styles adopted by students. By establishing a link between qualitative and quantitative analysis that different learning styles can be identified.

The new trend of teaching an individual in the classroom through individualized instruction is gathering momentum. Various methods, approaches learning models, etc. have been developed by researchers and educationist. Identification of the learning style is one of such methods.
This ability to learn, is the most important skill one can acquire. One is often confronted with different and new experiences to learning situations in classroom, in day to day life. In order to be an effective learner one has to shift through a process of getting involved, to listening, to making decisions and organising ideas, hence developing a learning style.

Thus, learning style is simply the way, method, or approach by which an individual learns.

Kolb (1976) regarded learning style as relatively constant attribute or preference of an individual.

According to Claxton and Ralston, (1978) learning style 'a student's' consistent way of responding to and using stimuli in the context of 'learning'.

Garger and Gluld (1984) defined learning styles as 'stable, persuasive characteristics of an individual expressed through the interaction of one's behaviours and personality, as one approaches a learning task.

According to Kaulback (1984), learning styles may refer solely to sensory modality.

According to McDermott and Beitman (1984) learning style is the distinct way in which a child characteristically goes about the learning process. They include the observable problem-solving strategies, decision-making behaviours and the child's reactions to the expectations and limitations of school learning situations in their analysis.

According to Keefe (1987) and Schmeck (1988) the term, learning style customarily refers to the usual cognitive processes through which a learner perceives, codes, organizes and remembers.

According to Hergenhahn (1988) has suggested that learning style comprises three types of behaviours: cognitive, affective, and physiological. Cognitive behaviour is based on a preference for a given type of information process, whereas affective behaviour is based on attitude or opinions. Attitude toward the instructors style or identification with the instructors as a person, and physical or physiological behaviours is based on environmental and biological factors.

Learning style is the way in which individuals begin to concentrate on, process, internalize, and retain new and difficult academic information (Dunn and Dunn, 1992,
Vermunt (1992, 1995) describes the concept of a learning style as consisting of four aspects:

1. Processing strategies
2. Regulation strategies
3. Mental models of learning
4. Learning orientation.

In this way, Vermunt conceptualises a learning style in some, what broader sense than, for example, Kolb (1984); Pask (1988); Schmeck, Geisler-Brenstein, and Cercy (1991) and Simons (1995) do. In their notions, the focus is mainly on cognitive activities.

CLASSIFICATION OF LEARNING STYLES

It is believed that there are no limits to the different styles of learning (Guilford, 1959b).

Marton and Saljo (1976) found that students differed in the level of understanding, they displayed or consequence of what was termed as their "approach to learning". Students either adopted a deep or a surface approach to tackle their learning tasks. A deep approach draws on a sophisticated conception of learning with an intention to reach a personal understanding of the material presented. In contrast a surface approach involves a simple conception as memorization and an intention merely to satisfy task or course requirements.

According to Kolb (1976) learning styles reflects many characteristics of students, including genetic coding, personality, and environmental adaptation abilities. Drawing from the work of cognitive theorists (Kolb and Fry, 1975). Kolb identified two dimensions along which cognitive learning occurs: concreteness/abstractness and experimentation/reflection. By intersecting these two dimensions, Kolb identified four types of learning:

1. Concrete experience
2. Reflective observation
3. Abstract conceptualization
4. Active experimentation

These four types of learning combined, yield four learning styles:

1. The accommodator
2. The assimilator
3. The diverges
4. The converges.
Researches in this direction have revealed some interesting findings, indicating towards the general characteristics of the four learning styles.

The accommodator (AC) as the opposites strengths of the assimilator (AS). Being best at concrete experience (CE) and active experimentation (AE). Their strength lies in doing things, in carrying out plans and experiments and involving themselves in new experiences. They tend to be more of a risk taker than people with other three learning styles. They tend to excel in situations, where they must adapt themselves to specific immediate circumstances. Accommodators tends to solve problems in an intuitive, trial and error manner (Grochow, 1973), relying heavily on other people for information rather than their own analytical ability (Stabell, 1973). At ease with people, but is sometimes seen as impatient and "pushy". They often excel in technical or practical fields such as business.

The assimilators dominant learning abilities are abstract conceptualization (AC) and reflective observation (RO). His/her strength lies in the ability to create theoretical models. Excelling in inductive reasoning; in assimilating disparate observations into an integrated explanation (Grochow, 1973). Assimilator like the converger is more concerned about abstract concepts, but is less concerned with the
practical use of theory. This learning style is more characteristic of the basic sciences and Mathematics rather than applied sciences.

Diverger on the other hand has the opposite learning strengths of the converger. He/she is best at concrete experience (CE) and reflective observation (RO). Diverger strength lies in his/her imaginative ability. He/she excels in the ability to view concrete situations from many perspectives and to organize many relationships into a meaningful gestalt. Diverger are interested in people and tend to be imaginative and emotional. Having broad cultural interests they tend to specialize in the arts. Diverger is a characteristic of person with humanities and liberal arts background.

The converger's dominant learning abilities are abstract conceptualization (AC) and active experimentation (AE). His/Her great strength lies in the practical application of ideas that Torrealba (1972) studied. Hudson's (1966) research in this style of learning (using different measure than LSI) show the converger to be relatively unemotional, preferring to deal with matters than people. Convergers are tend to have narrow interests, and often choose to specialize in physical sciences. According to Kolb, 1976.

In a study by Pask (1976), students showed distinct preferences in styles of learning, adopting Holistic style where the students tried to see the widest possible perspective and in serialist style they began with a narrow focus, concentrating on details and logical connection. Combination of style enabling everyday studying was described by Pask as Versatile style.

The learning style preferences often reflect cerebral dominance of left (serialist) or right (holist) hemisphere of the brain, combined with firmly established personality characteristics of the individual.

In an attempt to extend the original research to describe day-to-day studying in the normal institutions setting, Entwistle and Ramsden, (1983). introduced strategic approach to learning with its own characteristics intention. In this approach the student adopts deep and surface approach in combination designed to achieve the highest possible mark.

Entwistle and Waterson (1985) identified 16 styles of learning (subscales) across four domains producing four main factors, which have been described as deep, surface, organised, and strategic approaches to learning. The deep and surface factors contain, among their component items, the defining features derived from the
Features of Approaches to Learning

Deep Approach:
- Intention to understand
- Vigorous interaction with content
- Relate new ideas to previous knowledge / comprehension learning
- Relate concepts to everyday experience
- Relate evidence to conclusions
- Examine the logic of the argument

Surface Approach:
- Intention to complete task requirements
- Memory information needed for assessments
- Failure to distinguish principles from examples
- Treat task as an external imposition
- Focus on discrete elements without integration
- Unreflectiveness about purpose or strategies.

Strategic Approach
- Intention to obtain highest possible grades
- Organize time and distribute effort to the greatest effect.
- Ensure conditions and materials for studying appropriately.
- Use previous exam papers to predict questions.
- Be Alert to cues about marking schemes.

Vermunt (1992, 1996, 1998) distinguishes four different learning styles: an undirected, a reproduction directed, an application directed and a meaning directed learning style. Students characterised by an undirected learning style are having, for example, problems in processing the material for study, experiencing difficulties with the amount of study material and with discriminating what is important and what is not. This learning style is similar to the non-academic orientation proposed by Entwistle (1988). Students with a reproduction directed learning style are characterised by study behaviour directed mainly on reproducing what is learnt at examinations, in order to pass these successfully. This learning style is similar to the
reproducing orientation as proposed by Entwistle (1988). Students with application directed learning style to apply what they learn to actual, real world settings, comparable with the convergers and assimilators of Kolb (1984). Finally students with meaning directed learning style wish to find out what is meant exactly in their study materials, inter-relate what they have learned and try in a critical sense to develop their own vision. The meaning directed learning style is similar to what Dippelhofer-Stiem (1989) calls research oriented learning and what Pintrich, Marx and Boyle (1993) call a mastery goal orientation.

RELATIONSHIP BETWEEN LEARNING STYLES AND ACADEMIC ACHIEVEMENT

A number of studies have revealed a positive and significant relationship between learning styles and academic achievement.

Pask (1976), studied learning styles of 62 students in 2 series of experiments. The study revealed extreme styles of learning, namely: comprehensive learners and operation learners. The former had the tendency to jump to conclusions and to make impulsive links between ideas, and the latter failed to build up a general picture of what is to be ignored. In this way, the learning styles affected achievement.

Sevensson (1977), in his study of learning process and strategies involving 80 first year education students, found that the distinction between holistic and atomistic cognitive approaches was consistent over different occasions, when the students were asked to read and to recall their knowledge of the two tests in the experiment. Furthermore, the study showed that this concept of cognitive approach also had a functional relationship with academic attainment helping to explain not only examination success but also other aspects of the student's approaches to studying.

Aggarwal (1981) while studying students' learning styles and contract activity package found that students' who are motivated and responsible may continue either academic or creative studies independently through contract activity package.

Ramsden and Entwistle (1981), investigated the effects of academic department on students approaches to studying using a sample of 2208 students. The results indicated that, there was significant relationship between the variables among themselves, and that positive attitude and deep approaches were linked with academic progress.
Lembke (1985), in his study, reviewed literature about individual differences in learning styles. Four related topics were investigated, (1) learning style as the factor constituting individual differences among students; (2) the necessity of diagnosis to the learning style paradigm; (3) elements making-up individual learning style differences; and (4) the relationship between academic achievement and matching instruction to student's learning styles. Three principal points stood out in the review of the literature:

First, learning styles do exist.

Second, learning styles are not difficult to identify and diagnose.

Third, when students are taught through their preferred learning styles, academic achievement is enhanced.

Leeman (1985), in his review noted that when teachers at Roosevelt Elementary School in Hutchinson, Kansas, used the learning style inventory to determine the best learning conditions for each student, then allowed students to study and, take standardized tests under their preferred conditions. There was improved behaviour and achievement at all ability and grade level.

Okebukola (1986), investigated the influence of preferred learning on cooperative learning in science. It was concluded, that learning preference directly influences achievement.

Petruzillo and Scheinbart (1986), in their study described a program initiated at a high school in New York city, that identified learning styles of special education students in an effort to increase their achievement. This study concluded that the program led to gains in motivation as well as achievement.

Miller (1987) studied the effect of learning styles and strategies on academic success. He developed an inventory of learning processes to assess students learning styles and strategies. Results showed that students with high grade point average fared significantly better on deep processing (critical analysis of relationship).

Dunn and Dunn (1987), in their study on Dispelling the outmoded beliefs about student learning, challenged 15 popular beliefs about students and optimal learning styles. They demonstrated that individual learning styles vary. The academic achievement could be improved by providing flexible teaching styles and classroom environments, where students can match their learning styles.

Smith and Holiday (1987) in their investigation of differences in learning styles as measured by learning styles in 4th 5th and 6th grade students achieving at high-,
low- and average levels, concluded that, students did not learn in the same manner and that they manifested significant variations in the way they preferred to learn.

Verma and Sharma (1987) made a study to discover the difference in academic achievement of students belonging to different learning style groups. Results showed that there were significant differences in the achievement in various subjects and total area of study based on certain learning styles.

A four year investigation by the U.S. office of Education that included on site visits, interviews, observations, and examination of National Test Data concluded that learning styles based instruction was one of the few strategies, that had impacted positively on the achievement of classified special education students. (Alberg et al., 1992).

Sullivan (1993) revealed that the consistent effects of treatment across mediators and demonstrated learning style preferences to an appropriate instructional treatment, augmented learning outcomes. An additional finding was that, as the degree of learning preference increased, the effect size and mean standardized difference also increased. This gave support to the positions that, learning styles preferences may be learning strengths.

Shah, (1993), studied, the relationship between learning styles and achievement for high school students in vocational education programs. She found that the results did not refute or support the research hypothesis that, learning styles would affect achievement. The differences would be found in effect on English and Mathematics as compared to Vocational achievement.

Yates (1994), conducted study to identify the relationship between the students who scored well and less well on the Kentucky Instructional Results Improvement System and their learning styles. Each group was administered the Dunn, Dunn and Price Learning Style Inventory. The result indicated that the learning style elements of noise level, design, authority figures, kinesthetic, time of day, late morning and mobility either reached significance or closely approached significance.

The findings of Dunn et al. (1995) indicate, that matching students learning style preferences with educational interventions compatible with those preferences is beneficial to their academic achievement.

Gryniewicz (1995) investigated the role that student learning style plays in performance in introductory college chemistry. He found that relationships did exist
between learning style and performance. Sensing thinking learners made the highest grades, and sensing feeling learners made the lowest grades.

The findings of Goodwin (1995) indicated that the students taught by instruction that matched their preferred learning style, had significant gains in academic achievement.

Significant high achievement resulted, among previously failing students when they were taught with strategies that complemented their learning style preferences. A number of studies relating to achievement gains were reported by Lemmon, 1985; Clark-Thayer, 1987; Mickler and Zippert, 1987; Andrew's, 1990; Bruner and Majewski, 1990; Orsak, 1990; Elliot, 1991; Stone, 1992; Klawas, 1993; Nelson et al., 1993; Gadwa and Griggs, 1995.

But there are few studies with somewhat contrary observation:

Blagg, (1985) in his study to determine, whether cognitive style and learning style variables were predictive of success in a graduate allied health education program, came to conclusion that, there was no significant relationship between academic success and style variables.

Vondrell and Sweeney (1989) tried to determine, whether identification of learning style would assist in prediction of adult student success in an independent study program. It was concluded, that regardless of learning style, students could expect to complete the experience successfully.

In light of these studies, much of the wastage in academic achievement could be arrested, if the instruction and learning styles were matched evenly.

LOCUS OF CONTROL

If one regards giving a test in driving primarily as dependent on one's own effort and ability, then one can see the locus of control in the situation (control over whether you pass or fail) as being with you. However, if a person regards passing or failing as being predominantly out of his/her hands, then you see the locus of control depending upon chance or fate (e.g. how heavy the traffic is on that day) or upon powerful others beyond your influence (the driving test examiner). The former point of view would be typical of someone with internal locus of control, the latter of someone with external locus of control.

The concept of Internal-External (I-E) was first proposed by Rotter (1966) and it forms relatively small part of a more extensive personality theory incorporating many of
the principles established in psychology of learning. This theory is known as social learning theory. He proposed that the degree to which people believe their lives to be under their own control is an important dimension of individual variation. People who are relatively internal, believe they are responsible for their destiny. On the other hand, people who are relatively external, believe that the good and the bad things happening to them are determined by luck, chance or powerful others.

Before describing the social learning theory, it must be emphasized that Locus of Control is not a typological concept and people are not internally or externally controlled type. Locus of control is a continuum, and people can be ordered along that continuum. But it should be emphasized that the behaviour of an individual in any given situation is determined by many converging factors. To classify one as internal or external is a typological error, that ignores these factors, which over simplifies the predictive process and thus leads to disappointing results.

In Rotter's social learning theory, I-E is regarded as a characteristic attitude towards the world, referred to as a generalized expectancy. The expectancy about the locus of control over rewards and punishment generated by a person's position on the I-E dimension will influence the way that person perceives most situations, and hence will partially determine how the person will behave. Rotter regards generalized expectations as only one of the factors which determine the way person behaves in a particular situation. He believes that behaviour is a function of reinforcement. But generalized expectancies have important modifying effects on the expected relation between behaviour and reinforcement.

According to Rotter, first people have to believe that they have the capability to perform the necessary behaviour to earn the reinforcement, and also to regard the reward as worth the effort before they will act. Second, and even more important, they have to expect that when they behave appropriately they will actually receive the desired reward. Therefore, whether or not a behaviour occurs depends upon three conditions:

1. a person must have the capacity to produce the behaviour;
2. he must regard the reward as desirable; and
3. he must expect that the reward will be received, if the appropriate behaviour is produced.

Lefcourt (1966) said that locus of control is not to be regarded as an omnius trait similar to 'competence' and intelligence which pertains to each and every fact of
human endeavour. Rather, it can more fruitfully be defined as a circumscribed self-
appraisal pertaining to the degree, to which individuals view themselves as being some
casual role in determining specific events. Locus of control refers to the extent to
which a person believes that he has control over the reinforcements he experienced.

From the research summarized by Phares (1976), relating to I-E to a wide
variety of behaviours, a distinct picture of the internal as compared to external people
emerges. The internal person is more likely to be receptive to aspects of health care
like giving up smoking, taking exercises etc. Their desire for self determination is
reflected in their greater resistance to social influence and attempted attitude change.
In part, this behaviour is a result of the internals' superior knowledge, since, they are
characterized by their effort to seek out information which enables them to exert
greater control over their environment.

In the area of mental health, the internals are generally found to be better
adjusted and less anxious as compared to externals. External individuals beliefs are
symptomatic of a number of psychiatric disorders such as depression and
schizophrenia. In short, the internal individual, in contrast to the external, is
independent, achieving and masterful.

Pettersen (1987), in dealing with a theoretical clarification of the concept of
locus of control, defined internal locus of control as the perception that, an individual
has of being able to influence the occurrence of reinforcements around him by his
behaviour. In the same way, the external locus of control expresses the perception of
an individual who believes that influencing reinforcement around him is not within his
control. In other words, it is the perception of change, the possibility that a
reinforcement might occur.

This definition excludes the conception of locus of control which involves
different sources of control such as, chance, luck, destiny, the influence of others and
the complexity of the environment in the case of external sources and the
individual's own personal characteristics and behaviour in the case of internal sources.

The variable of locus of control is of major significance in understanding the
nature of learning processes in different kinds of learning situations. Consistent
individual differences exist among individuals in the degree to which they are likely to
attribute personal control to reward in the same situation.
RELATIONSHIP BETWEEN LOCUS OF CONTROL AND ACADEMIC ACHIEVEMENT

A number of studies have identified significant relationships between locus of control and academic achievement.

Stephens (1973) has found externality to be related to achievement. Phares (1976) in a discussion of locus of control and academic achievement, concluded that, internals tended to show superior performance in comparison to their external counterparts.

Vogel (1976), conducted a study to determine the effects of perceived locus of control on the academic achievement of 673 fifth and sixth-graders. Main effects of the locus of control reached significance on the analysis of covariance at p=.10 for reading, p=.65 for languages and p=.02 for mathematics. Even among more powerful predictors, locus of control stood its ground. There was no interaction among locus of control, intelligence quotient, sex and socio-economic levels. Thus, it would appear that the effects of locus of control on academic achievement are the same for both sexes, for various levels of intelligence and for different socio-economic levels.

Clinger (1980), in a study titled "Relationship between motivation, locus of control, knowledge of study skills and achievements" examined if addition of certain controlled affective variables could improve significantly the predicting power of cognitive variable for academic achievement of college freshmen. Controlled variable was intelligence and the dependent variable was academic achievement. Locus of control, motivation, and study habits were the affective variables investigated. Findings include: (1) individual affective variables and locus of control were not significant contributive factors of academic achievements, when sex and intelligence were controlled, (2) when taken as a unit, the affective variables accounted for a small amount of variance in academic achievement. Since the first and basic finding contradicted many previous studies quoted and the relationships in the second finding had their Achilles' heels, further research was recommended.

Fry and Coe (1980), found that internal subjects had significantly higher academic achievements than the externals (F=10.31, for 1-143 df, p>.01).

Bar-Tal, et al. (1980), in their study, found that internal subjects had higher academic achievements, lower level of anxiety and higher level of aspirations and socio-economic status.
Gruzynski (1981), investigated factors affecting academic achievements in high-ability Junior high school with varying self-concept. Factors studied include locus of control, vocational aspirations, perception of physical appearance and perception of interpersonal adequacy, paternal occupation and sex of the student beside intellectual ability and self-concept of the student. Results indicated that locus of control was not contributing significantly to reading achievement in junior high school sample. Beyond that, it was explained by intellectual ability and self-concept of the student.

Allen (1982), conducted a study in which he reported that: (1) internal-control subjects achieved higher scores on Mathematics and language than external subjects; (2) internal-control subjects scored higher on reading and language than external subjects; and (3) no difference were found between internals and externals on any achievement tests.

Puri (1984), showed that the internals were superior to externals in academic achievement. He found the correlation between locus of control and academic achievement to be -.34. The high score on locus of control was negatively and significantly related to achievement at 0.01 level, suggesting that external orientation on the part of pupils was negatively related to academic achievement.

Studies relating locus of control to academic performance have reported significant correlations in expected directions (Trice, 1985; Nunn, Montgomery & Nunn, 1986; Ogden & Trice, 1986; Chadha, 1989; Cone & Owens, 1991; Maqsud & Rouhani, 1991).

These findings providing directions to the researcher to further investigate if locus of control has any bearing on a person's level of intellect, scholastics performance or the approaches, one adopts to complete cognitive tasks.

STATEMENT OF THE PROBLEM

In view of the above, the present study was conceived of and stated as under :-

"Learning styles and locus of control of gifted and average students in different academic subjects":

DELIMITATION OF THE STUDY

Due to the constraints of resource and other factors, the present study was delimited to:

a) Students studying in class IX only.
b) Only four Government Model Senior Secondary Schools and three Private High Schools of Chandigarh under the C.B.S.E. Board.
c) Out of the various independent variables affecting giftedness, present study was delimited to only two independent variables of learning styles and locus of control in different academic subjects.

OBJECTIVES OF THE STUDY

After identifying and selecting the gifted and the average students the study was then carried out with the following major objectives:

1. To compare the gifted and average students on the variables of learning styles and locus of control in different academic subjects.
2. Comparison between males and females:
   a) To compare the gifted males and females on the variables of learning styles and locus of control.
   b) To compare average males and females on the variables of learning styles and locus of control.
3. School-wise comparisons: between private and government school students:
   a) To compare the gifted students of private and government schools on the variables of learning styles and locus of control.
   b) To compare the average students of the private and government schools on the variables of learning styles and locus of control.
4. Bi-variate relationships:
   To study the nature, extend and magnitude of underlying relationship between the variables under study, in case of gifted and average group.
5. Counseling of the gifted:
   The counseling of the gifted was done to access what is it that accounts for the "giftedness" which is a distinct feature and draws the attention of the society.

HYPOTHESES BASED ON THE OBJECTIVES OF THE STUDY

In order to achieve the above stated objectives, the following hypotheses were formulated as stated below:

1. Comparison between gifted and average students:
   a) Gifted and Average students exhibit different learning styles in the subject of English, Mathematics and Science.
b) It is expected that students are governed by external locus of control.

2. Sex-wise comparison between gifted and average students
   There exist significant differences between males and females with respect to their general learning styles and styles of learning in the subjects of English, Mathematics and Science and Locus of control.

3. School-wise comparison between gifted and average students:
   There exist significant difference between the gifted and average students of private and government schools on all the variables.

4. Hypotheses pertaining to bi-variate relationship:
   There exists significant positive relationships between learning styles and locus of control.

5. Hypotheses pertaining to counseling of the gifted:
   Both family environment and school environment contribute significantly in making of the gifted.