CHAPTER – II
CHAPTER-II

CONCEPTUAL FRAMEWORK OF
THE VARIABLES

In order to get the conceptual understanding of the various variables considered for the present study, and also to understand the rationale of the relationship of these variables with scientific attitude of IX class students, the theoretical views of the variables under consideration are presented here.

2.1 PERSONALITY

Modern aim of education is all round development of personality. Educators are busy in developing wholesome and balanced personality. Personality involves the overall organization and the relative potencies of his psychological needs; the manner in which the individuals personal “style of life” affect other people. According to Murray and Kluckhohn (1948), “Personality is the continuity of the functional forces and forms manifested through sequence of organized regnant processes in the brain from birth to death”. The functions of personality are: to allow for the periodic regeneration of energies by sleep; to exercise its process, to express its feelings and valuations, to reduce successive need tensions, to design serial programmes for the attainment of distant goals; to reduce conflicts between needs by following schedules which result in a harmonious way of life, to reduce conflicts between personal dispositions and social sanctions, between the vagaries of antisocial impulses and the dictates of the super ego.
by successive compromise formations, the trend of which is towards a whole
hearted emotional identification with both the conserving and the creative
forces of society.

There are many other definitions of Personality given by
psychologists and for convenience they have been classified as follows:

(i) In terms of aggregate of disposition and tendencies

Such definitions emphasize “the sum total of” or “aggregate
nature” of personality. Prince (1929) tried to give personality a broader place
by accepting the role of both heredity and environmental factors in
constituting personality. Personality in his words “is the sum total of all
biological innate depositions, impulses, tendencies, attitudes and instincts of
the individual and the dispositions and tendencies acquired by experience”.

According to critics, the omnibus type of definitions does not
serve any purpose. It merely makes a count of all dispositions and
tendencies.

(ii) In terms of integration and configuration phenomenon

The definitions of such kind emphasize the wholeness and
configuration of personality. The psychologists in this category lay stress on
the integrative and configurational aspect of personality. They say human
personality is a well organized and integrated phenomenon.

According to Gessell (1946) personality is defined as “the
pervasive super pattern which expresses the integrity and the characteristic
behavioural individuality of the organism”. In other words personality is the
entire organization of a human being at any stage of his development. This
definition draws attention to the complex nature of human personality. He
emphasized the integrity in terms of pervasive super patterns which are qualitative in nature.

(iii) In terms of hierarchical levels:

As per James (1920) there are four levels of human personality. The first level is the ‘material self’, which includes the human body, hereditary and family possessions. The second level of the human personality or self is termed as social self. It is expressed, when a person develops social relationships and engages himself in social interactions. The third level of the self is ‘spiritual self’. James regarded it as the unity within the individual which kept him united and integrated within the self inspite of his assuming different selves in different social groups. The fourth level of the self is called as ‘the self of selves’ i.e. the ‘Pura ego’. One had to attain perfect self-realization to reach this level.

Self-actualization has been described by Maslow (1968) in terms of integrated individual. He has mentioned a hierarchy of needs which are indirectly involved in the development of self-actualized personality. These needs are for

(i) Physiological gratification
(ii) Safety
(iii) Esteem and
(iv) Self-actualization.

The development and progress of personality from the physiological level to the level of self-actualization is indicative of the hierarchy in human personality.
(iv) **In terms of adjustment**

The individual has to live in an environment which has a number of pressures of various types. There are physical, social, economic, cultural pressures and so on. A person has numerous types of demands, desires and wishes and he must learn to adjust to his desires and wishes keeping in view the kind of pressure he is faced within a given environment.

According to Shaffer and Shoben (1956), “the personality of an individual may be defined as his persistent tendencies to make certain qualities and kinds of adjustments. They are also of the view that, “Personality does not depend on one or a few characteristics only, but upon the interplay of practically all of an individual’s qualities. Physical structure, chemical functioning, learned motives and habits of adjustment, all contribute to personality and not as separate entities but as interacting aspects of an organized system”.

(v) **In terms of distinctiveness**:

The definition given by Allport (1937) is a broad definition, which fully takes into account the wholeness, the need for adjustment and the distinctive and unique features of human personality. As defined by Allport, “Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustment to the environment”.

A synthesis of various approaches to definitions of personality can be found in this definition. The key words in this definition are ‘dynamic organization’, ‘psycho-physical systems’, and ‘unique adjustments’. By dynamic organization is meant that organization of personality which is constantly changing and evolving. The psychophysical refers to habits,
dispositions, sentiments, tendencies and attitudes. By unique adjustment means those adjustments which are spontaneous, creative and unique in the sense that they differ from individual to individual.

**Approaches to personality**

Personality is a highly complex field of psychological enquiry, open to many different interpretations since it is assumed to reflect the very essence of individual’s personal manner of living. During the scientific era of psychology, personality has been variously defined, i.e.,

a) In terms of several typical systems e.g. introverts, ambiverts and extroverts (Jung, 1923), aesthetic, pyknic, athletic and dysplastic types (Kretschmer, 1925), normal, hysteroid, cycloid, schizoid, and epileptoid types (Rosanoff, 1927), cerebrotonic somatotonal and viscerotonic types (Sheldon, 1942);

b) In terms of developmental descriptive concepts (Gessel, 1940)

c) In terms of psychological traits or telenomic trends (Allport, 1937, Cattell, 1971, and many others) •

d) In terms of various resolutions of dominating purpose in life e.g. trying to overcome a feeling of inferiority (Adler, 1924)

e) In terms of consistent complex of self regarding attitude, or ego structures (Lecky, 1945, Sherif and Cantril, 1947, Combs and Snygg, 1959) &

f) In terms of a dynamic complex of psychological needs, motor-perceptual systems, and characteristic models of conflict resolution (Freud, 1938, Lewin, 1936 and Murray, 1938).
Theories of personality

Different theories about personality structure and organization have been given by psychologists. Murray (1938) has attempted to explain this. According to his reasoning, psychologists may be divided into two fundamental groups, the peripheralists, and the centralists. The peripheralists are attracted to directly observable things. They define personality in terms of behaviour patterns “as such” and evidence little curiosity about central processes, which may underlie these behaviour patterns. They concern themselves with tangible, measurable variables like attitudes, traits, vocational pursuits and the like. On the other hand; the centralists are attracted to more subjective aspects of personality like, feelings, desires and intentions. They are more concerned with underlying central nervous system constructs, and do not hesitate & postulate cause effect relationships between overt behaviour and covert psychological and physiological structures. Different theories of personality are discussed below.

(i) Descriptive theory of personality growth

Gessell (1940) on the basis of his biological clinical approach to child development has elaborated descriptive theory of the personality growth of the children during the first ten years of life. Although Gessell’s theory of personality growth is primarily descriptive, it does have some predictive implications in that it describes stages of personality organization which are supposed to be subsequential with age progression. Gessell’s theory of personality organization is thus concerned with general developmental stages through which all children are supposed to move in the process of growing up. These stages constitute general description of behaviour organization within areas like the following; motor characteristics,
personal hygiene, emotional expression, fears and dreams, self and sex, interpersonal relations, play and pastimes, school life (if any), ethical sense, and philosophical outlook. Since this theory does not attempt to infer the nature of underlying psychological variable that produce individual differences in personality, it is not very helpful in promoting the understanding of individual differences.

(ii) **Freud’s (1957) approach to personality theory**

According to the present theoretical constructs of Freud’s approach to personality structure, the human personality is viewed as consisting of dynamic interactions between and among the id, the ego, the superego and the outer world. These interactions are characterized by the varying levels of consciousness.

(a) **The id**

It is unborn, unconscious, moral, illogical, unintegrated and the great reservoir of libidinal energy. It operates on animal level and is dominated by the principle of pleasure. It is the source of all instinctive energy for the individual.

(b) **The ego**

It is called the executive of the personality and obeys the reality principle. It is an integrated organization of mental processes involving the impulses from the id, the censure of the superego, and the demands of the outer world. It controls the mobility and perception of the external environment. The ego distinguishes between the subjective reality and things in the external environment.
(c) The Superego

It represents the ideal rather than the real and strives for perfection. It is an outgrowth of ego. Its principle function is to serve as a model for and a censor over the ego’s transactions. Its influence often creates feelings of anxiety and guilt in the ego. Another function of it is the setting of standards of exemplary conduct and human aspirations. It works in accordance with the moral standards authorized by the agents of society.

Freud further said that if there is equivalence between the id and the superego, there will be a balanced personality but if there is no proper equivalence between the id and the superego, there will be a maladjusted personality.

(iii) An eclectic theory of personality organization

Murray (1938) has conceived personality as consisting of an integrated aggregate of ‘needs’ and perceptual ‘presses’. Needs are defined as what the subject requires to reduce striving behaviour. The frequency and the intensity of the various needs (which covers a host of social as well as personal need situations) define a principle component of an individual’s personality organization. A press or an object or person is defined as what it can do ‘to’ or ‘for’ an individual’s personality i.e., the power it has to affect the well being of an individual. Needs and presses are functionally related. Environmental presses are often interpreted by the individual on the basis of current needs. The behaviour resolution of a particular complex of need-press is called a ‘thema” in Murray’s theory. A thema is the dynamic structure of an event, i.e. the general nature of the environment and the individual’s response. According to this theory, an individual can infer the general nature of one’s needs and perceived presses by analyzing a large
variety of his thematic tendencies. These thematic tendencies are most revealing when the individual feels no need to cover his "real" needs and perceptions.

However, Murray's approach does not rely completely on projective procedure for obtaining information about the individual's needs and presses.

For the purpose of present study, personality is that which permits a prediction of what a person does in a given situation and is concerned with all the behaviour of the individual both over and under the skin. In the present study, scores obtained on Indian adaptation of Cattell and Eber (1967) 16 personality factors questionnaire by Kapoor and Tripathi (1981) are the measures of personality.

COGNITIVE VARIABLES

Bloom proposed that there is a hierarchy of cognitive skills possessed by each individual. Learning takes place at a different level for each individual depending upon his prior concepts and generalizations at any given time and his ability to use them in a total thinking process. Different learning levels are the level of maturity of concepts and generalizations. In the present study following cognitive variables have been taken:

2.2 INTELLIGENCE

It is the teachers who try to cultivate intelligence and the psychologists who try to measure it but as such no body seems to know precisely what intelligence is. Some definitions which can be quoted are as under:
Intelligence is the ability to carry on abstract thinking:

In other words, an individual is intelligent in proportion to as he is able to carry on abstract thinking (Terman, 1921). “Intelligence manifests in purposive direction, active adaptation and conscious correction. It is the ability to make and maintain a given mental set, the capacity to make adaptations for the purpose of attaining the desired end and the power of self-criticism”. Binet (1916) also represents this view.

Intelligence is the ability to adapt or adjust:

Stern (1914) belongs to this group. But this definition puts certain difficulties. For example, there are some people with whom it is generally agreed that they are not very intelligent and who do not score very well on intelligence test, yet they adapt very well to their environment, and vice-versa. Therefore, what is successful adjustment for one individual would be a poor adjustment for some one else, since people from different cultures have different goals, talents and aspirations.

Intelligence is the ability to learn:

According to another group of psychologists the more readily one is able to learn, the more intelligent he is. But this definition also involves the limitation of perceiving it as a unitary phenomena. There are many different kinds of learning and individuals who do well on some kinds of learning do not necessarily do well on others.

“Intelligence is the global or aggregate capacity of an individual to act purposefully, to think rationally and to deal effectively with his environment” (Wechsler, 1944). If we see carefully, then it seems that this definition combines the above three groups of definitions.
Intelligence is the ability to undertake activities that are characterized by difficulty, complexity, abstraction, economy, adaptiveness to goal, social value and emergence of originals” (Stoddard, 1943). But the difficulty with Wechsler (1944) and Stoddard’s (1943) definitions is that in these definitions many of the terms used are so vague that it would be extremely difficult to demonstrate that any given intelligence test is actually measuring the global capacity to act purposefully, to think rationally and to deal effectively with the environment.

An overview of above definitions of intelligence reveals the following factors:

a) Intelligence is the ability to solve problems.

b) Intelligence is the ability to learn.

c) Intelligence is the ability to adapt to novel situations.

Vernon (1960) perceived three broad categories for defining intelligence. These were:

(a) Biological

These biological definitions emphasize the individual’s capacity to adjust or adapt to environment. Adaptation here refers to modifying behaviour either overtly or covertly as a result of experience.

(b) Psychological

These definitions stress mental efficiency and the capacity for abstract reasoning.

(c) Operational

The definition belonging to this category involves making detailed specifications of intelligent behaviour and then finding measures of these specifications. Intelligent behaviour is thus expressed in terms of these
measures. The expression “intelligence is what intelligence tests measure” is often used to describe the operational definition.

Intelligence refers to a general level of cognitive functioning, as reflected in the ability to understand ideas and to utilize abstract symbols (verbal, mathematical or spatial) in the solution of intellectual problems. Perhaps this is the most agreed view about intelligence.

Some of the relationships between the more theoretically oriented work on models of intelligence on the one hand, and the more practically oriented work aiming to develop instruments to measure intelligence on the other can be discussed as:

**One or many dimensions of intelligence**

According to Unitary theory of intelligence, which was put forth by Stern (1914), intelligence is single unit or capacity to solve all types of problems. According to this theory a man who is intelligent in doing one task will also be intelligent in doing other tasks because intelligence is the allround capacity of the individual. For example, Sri Nivasa was a great mathematician. According to this theory he could be a great poet or singer also. Spearman (1904) on the basis of empirical studies of several sets of variables by rank matrix correlations concluded that “all braches of intellectual activity have in common one fundamental function (or group of functions), whereas the remaining specific elements of the activities seem in every case to be wholly different from that in all the others”. These results were formalized in Two-factor Theory of Intelligence by Spearman (1904) which states that performance on a task is affected by two factors only, the g-factor, which is common to all tasks and the s-factor which is unique to each task. Every individual has one g-factor and some s-factor.
The g-factor is always the same for the same individual and the s-factor varies from task to task. It means different individuals differ both in their g factor as well as in their s-factor. In doing any activity g-factor is always involved and some s-factor is also there.

Multiple factor theory regards intelligence as constituting a multiple of separate factors or elements. According to this theory intelligence is nothing more than a convenient name for an infinite number of actual or potential specific connection between the stimuli and responses. Difference of intelligence among people are due to the number of connections in the neurological system.

Thurstone (1938) applied multiple factor analysis to test battery of 38 tests, many of which were newly developed and found about a dozen factors, each of which accounted for performance on a subset on the factors in the battery. There was no sign of a general factor. Most factors identified by Thurstone (1938) were replicated several times by Thurstone and his colleague and it was possible to set up a list of six or seven easily replicable primary mental abilities (PMAs), such as: verbal comprehension (V) involved in understanding of language and frequently found in tests such as reading, verbal analogies, and vocabulary, word fluency (W), affecting the fluent production of language and measurable by tests such as rhyming or naming words in a given category; induction (I), measured by test requiring the subjects to find a rule in complex material, space (S), found in manipulation of geometric or spatial relations; perceptual speed (P), reflected in quick and accurate grasping of visual details, and number (N), involved in quick and accurate arithmetic computations.

The Group Factor Theory accepts the fact that intelligence consists of a number of primary abilities (groups). Every primary ability is
independent of the other ability. Every primary ability is found in a particular mental ability. So according to this theory, a child who is intelligent in one group of knowledge may not be intelligent in the other group. But he may be equally intelligent in the various subjects of that very particular group (e.g. a person well in physics may be equally well in chemistry but not well in history). According to this theory, there are eight primary mental abilities, which constitute intelligence;

(i) Numerical ability
(ii) Verbal ability
(iii) Rote memory
(iv) Verbal comprehension
(v) Spatial relations
(vi) Perceptual speed
(vii) Inductive reasoning
(viii) Deductive reasoning

Guilford (1967) in his Structure of intellect model rejects the idea of a general intelligence factor and also broad factor groups like Thurstone’s primary abilities. He believes that many aspects of intelligence tend to be ignored when items are lumped together to form tests. An item used as a test of verbal ability is distinguished from one that is non-verbal on the basis of its content-words as opposed to pictorial material. But what one does with the content of the test item (e.g. memorizes it or uses it to engage in a reasoning process) will depend upon the nature of the task and may be relatively independent of the content. Suppose that you are shown a picture of a dozen different objects and told that you will be asked to recall the names of the objects at some later time, does this task involve verbal or pictorial ability? To be sure, a picture is presented but most subjects will
name the objects and then rehearse the names, rather than try to memorise the picture itself.

Guilford maintains that intelligence test items should not be distinguished in terms of content alone, but also in terms of the operations performed upon the content and the product that results. His Structure of intellect model (as shown in the figure) shows the way in which 4 contents, 5 operations and 6 products combine to yield 120 unique intellectual factors.

**Figure showing Guilford’s Model of Intellect (1967)**

Each of small cubes in the solid represents a unique intellectual ability. An intelligence test item can be distinguished in terms of its contents, the kind of operation the subject must perform on the item, and the product resulting from the particular operation applied to a specific content.
A more elaborate hierarchical model has been developed by Cattell and Horn (e.g. Cattell 1971, Horn 1980). The two dimensions of most central importance in this model are fluid intelligence (GF) and crystallized intelligence (GC); and the whole theory is often referred to as GC-GF theory. Both these dimensions reflect the capacity of abstraction, concept formation, and perception and education of relations. The GC dimensions, however, is thought to reflect individual differences associated with systematic cultural influences, and is central in task of verbal –conceptual nature. The GF dimensions in contrast reflects effects of biological and neurological factor and factors such as incidental learning, and this dimension is most strongly shown in tasks that are either new or very familiar to the examinees.

The most influential model was, however, proposed by Vernon (1950) as a hypothetical integration of all the factorial investigation that has been carried out. In the Vernon model, factors of atleast three degrees of generality are identified: the general factor, major group factors and the minor group factors. Among the major group factors Vernon distinguishes between verbal numerical educational (V:ed) and spatial practical-mechanical-physical (K:m) ability. The V:ed factor subdivides into minor groups, such as verbal and number factors and reading, spelling, linguistic and clerical abilities, and also into fluency and divergent thinking abilities. The K:m factor subdivided too and this complex includes minor group factor, such as perceptual, physical, psychomotor, spatial and mechanical factors. At the level below minor group factors the tests would be found but “there is ample evidence to support the view that group factors are almost infinitely sub-divisible, depending only on the degree of detail to which the analysis is carried” (Vernon, 1950).
The Vernon model thus represents the most influential hierarchical model from the British tradition of research while the Cattell-Horn model represents the most elaborate and influential of the hierarchical model developed within American research. There are obvious similarities between these models, but there are also differences: The Cattell-Horn model lacks the g-factor which has such a prominent place in the Vernon models and there are only two broad group factors in the Vernon models, while there are several broad abilities in addition to GF and GC in the Cattell-Horn model.

Research experiences have revealed that intelligence is distributed according to the law of normal probability curve. Very few individuals possess a high degree of intelligence and few others have low degree of intelligence. But majority of individuals possess average intelligence.

2.3 ACHIEVEMENT

The process of education includes three major divisions: formulations of objectives, designing learning experiences for the achievement of objectives and assessing the outcomes or achievements of education. As such testing and measurement are as old as or rather older than any system of education. They have been used for the process of educating and advising young people.

The word ‘achievement’ means the end gained or level of success attained by an individual or group on the completion of a task whether it can be academic, manual, personal or social. Academic or scholastic achievement means the attained level at which the student is functioning in school tasks such as Hindi or Mathematics or Science as
measured by school marks or grade earned. In trade and occupation, it will mean the change in the level of skills attained as measured by marks or grades. Achievement, thus, means all those behavioural changes which take place in the individual as a result of learning experience of various kinds.

As defined by Crow and Crow (1956), Achievement means the extent to which a learner is profiting from instruction in a given area of learning. In other words, achievement is reflected by the extent to which skill or knowledge has been acquired by a person from the training imparted to him; it is the outcome of general and specific learning experience. Therefore, the special acknowledgement of a person’s skill, the range and depth of his knowledge or his proficiency in designated area of learning or behaviour is indicative of the extent of his achievement.

According to Good (1959) there seems to be considerable similarities in as much as all of them place emphasis on knowledge attained or skill developed in the academic subjects usually designated by test scores. In other words, academic achievement refers to the degree or level of success or proficiency attained in some specific area concerning school or academic work.

Pressey, Robbinson and Harrock (1959) define achievement as “the status or level of person’s learning and his ability to apply what he has learned”. According to them achievement would not only include acquisition of knowledge and skills but also attitudes and values as aspects of achievement. Achievement as manifested by the application of acquired skills and knowledge is a product of learning attitudes and interests since these factors would implicitly influence the extent of achievement. It is obvious that whether a particular learning is referred to as an achievement or not, depends upon whether somebody considers it desirable or not. Hence
any behaviour that is learned many come within the definition of achievement.

Good (1973) defines academic achievement as “knowledge attained or skill developed in the school subjects, usually designated by the test scores or by marks assigned by the teacher or both.”

The need for measuring academic achievement is based on two fundamental assumptions of psychology. First, there are differences within the individual from time to time known as behaviour oscillations i.e. academic achievement of the same individual differs from time to time, from one class to another and from one educational level to another. Secondly, there are individual differences. Individuals of the same age group, of same grade, usually differ in their potential abilities and academic proficiency whether these are measured by standardized measure of achievement by teacher’s grading or by marks obtained in tests and examination.

Science is one of the important subjects at the secondary stage. Science achievement is the extent to which a learner progressed in science subject. It is measured from the marks secured in previous year’s examination, i.e. VIII class examination.

FACTORS AFFECTING ACHIEVEMENT

The difference in the level of academic achievement to the large extent can be attributed to different levels of receptivity between children and their ability to demonstrate the proficiency attained by them. The factors affecting academic achievement may be classified into:

1. Subjective Factors
2. Objective Factors
1. **Subjective Factors**
   
   These are related to the individual himself. It includes:
   
   (i) Intelligence
   (ii) Creativity
   (iii) Learning ability
   (iv) Aptitude
   (v) Self concept
   (vi) Study habits
   (vii) Motivation
   (viii) Level of aspiration
   (ix) Attitude towards teachers and course
   (x) Perception of the school
   (xi) Social and emotional adjustment

2. **Objective Factors**

   These are related to the environment of individual. It includes:
   
   (i) Socio-economic conditions
   (ii) Medium of instructions
   (iii) Teacher’s personality, efficiency, training attitude and method.
   (iv) Educational facilities
   (v) Evaluation system
   (vi) Family traits
   (vii) Psychological environment in the school
   (viii) Number of students and size of school and expectations etc.
2.4 ACHIEVEMENT MOTIVATION

This concept was developed by McClelland and refers to the motive to achieve some standard of accomplishment or proficiency. People with a strong achievement motive (which McClelland calls need for achievement) prefer moderate to easy or hard goals or risks, want concrete feedback regarding task performance, prefer tasks where skill rather than luck determines the outcome. They seek personal responsibility, have a future time perspective and err somewhat on the side of optimism in estimating their chances for success, especially on new tasks.

McClelland (1961) claims that the achievement motive is crucial in entrepreneurship and influences success in entrepreneurial occupations. He has even claimed that cultural differences in achievement motivation account for differences in economic growth rates. It is argued that the need for achievement is fostered by child rearing practices which encourage independence. It is held by McClelland to be a subconscious motive, and therefore more accurately measured by projective techniques such as the Thematic Apperception Test, than by self reports.

A person wants to have a unique accomplishment, an accomplishment of excellence. Such concerns and communities grow their predominance of certain motives at a given period of time. Studies on motives reveal that if a community has a predominance of achievement and affiliated motives then they grow faster than other communities having predominance of other motives. It has been also observed that a person's high level of achievement motive makes him sensitive to the concern for excellence and as a result he performs better to attain a sense of uniqueness.
Thus, motives specifically achievement motive play a significant role in the total shaping of behaviour and personalities which in turn shapes the economic and social destiny of a given society.

When a person tries to manifest concern for excellence in his work, we call it a behaviour backed by achievement motive. A person having some achievement motive will try to strive for excellence in his work.

Achievement oriented people would enhance education and manifest concern for excellence in later work. The concept of need achievement was put forth by Murray (1938). He defined need achievement in terms of the following:

a) To accomplish something difficult.
b) To master, manipulate or organize physical objects, human beings or ideas.
c) To do a task as rapidly and as independently as possible.
d) To overcome obstacles and attain a high standard.
e) To excel one’s self.
f) To rival and surpass them.
g) To increase self regard by the successful exercise of talents.

Atkinson (1964) states, “the theory of achievement motivation attempts to account for the determinants of the direction, magnitude and persistence of behaviour, in limited but very important domain of human activities”.

Heckhausen (1967), the German exponent defines the achievement motivation as the striving to increase, or keep as high as possible, one’s own capacity in all activities in which a standard of
excellence is applied and where the execution of such activities can, therefore either succeed or fail.

Correspondingly, that is an approach and avoidance tendency in achievement motivation. It has been studied by Atkinson as ‘Hope of Success’ and ‘Fear of Failure’. He concluded that person in whom the achievement motive is stronger, prefer intermediate risks, while persons in whom the motive to avoid failure is stronger avoid intermediate risks and prefer instead either easy and safe undertakings or extremely difficult undertaking.

Mehta (1969) has put forward a wider conceptual definition of achievement motivation as a dissatisfaction with the present state of affairs and an urge to improve the life condition or sense.

Generally achievement motivation has two aspects positive and negative aspects. The person who had got more or approach aspect is called high need oriented person and a person having more avoidance is called a low motivated person.

High achievers enjoy working hard for things and overcoming difficulties. They not only enjoy challenges, but actually see tasks which challenge them, they will find no joy to turn at simple easy things which anyone could win.

In achievement oriented individual, the thoughts are focused on excellence, progress, doing things better, faster, more efficiently, doing something unique or in general ways competing with others.

They are optimistic about their abilities and feel if one could reach the tcp they too are capable of doing likewise. They possess a dynamism which induce them to try to do better for their positions. A
student who stands second in class will determine to come first in the next examination.

In competing with others, they find a real accomplishment. They can ever overcome certain failure in their struggle for excellence, but they will make sure that they can be as good as the others. Besides all this, an achievement oriented person aspires to be unique in his accomplishment. He would like to maintain a certain standard of excellence in whatever he decides to do in a unique manner, thus deviating from an average personality and this will motivate him in doing any task, since they possess a peculiar desire to strive for excellence.

High need achievement oriented people fail less often in reaching challenging goals, as they think out their plan and obstacles carefully well in advance.

So, the term ‘Achievement Motivation’ has been defined by psychologists as the tendency to maintain and increase individual proficiency in one’s area of work. It is an ‘urge to improve’. Just as everyone has an achievement motive to some extent but some people are consistently more oriented towards achievement than others. Perhaps the most important aspect of a really strong achievement motive is that it makes it’s possessor very susceptible to appeals that he tries harder. Again most people will put more efforts into their work if they are challenged to do better or if some valid reason for exertion in pointed out to them, but the achievement oriented person is likely to out-strip all others in his zeal to improve his performance when he is challenged to do so. The stronger the achievement drive, the greater the probability that the individual will demand more of himself. Perhaps the most fascinating aspect of the
achievement motive is that it seems to make the accomplishment an end in itself.

An achievement oriented person does not spurn tangible rewards and even has a rather unexpected use for them; they are not really essential to him, either. He takes a special job in winning. In competing successfully with a difficult standard; this means more to him than money or a pat on the back.

Achievement motivation is, thus, a learned motive to complete and strive for success. As almost every activity in our daily life is to be viewed in terms of competition and success versus failure, the need to achieve influences behaviour in a large number of quite diverse situations. And because it is a learned motive, there are wide differences among individuals in the past experiences and hence in their motivation with respect to achievement.

**AFFECTIVE VARIABLES**

Affective domain as described by Krathwohl and his associates is based on internalization process, which helps us to internalize a phenomenon or value (Krathwohl et al., 1964). Internalization process occurs in stages, an individual becomes aware of a phenomenon or value; shows his willingness to attend to the phenomenon; responds to the phenomenon with a positive feeling, and ultimately the phenomenon or value becomes his own outlook.

**2.5 INTEREST IN SCIENCE**

Interests are one of the important traits of the personality of an individual which have significance for educational and vocational success.
and satisfaction. These are manifested as likes, dislikes, indifferences, preferences, and evaluation.

Interest are related to some extent with educational and vocational choices but are too deep seated and too general to be perfect indicators of any such specific outcomes as educational or vocational choices.

The knowledge and understanding of a child’s interest becomes a major factor in educational guidance. An educational plan related to the child’s ability and aptitudes may fall short of realization because it is not consistent with his interests and fails to stimulate the desired application of effort on his part.

“Millions of the items of the outward order are present to my senses which never properly enter into my experience. Why? Because they have no interest for me. My experience is what I agree to attend to. Only those items which I notice shape my mind-without selective interest, experience is an utter chaos. Interest alone gives accent and emphasis, light and shade, background and foreground – intelligible perspective in a word” (By James, as quoted by Taneja, 1972).

Interest thus are very traits of the personality of an individual. No clear-out definition of interest exists. At the one extreme is a casual liking or disliking directed towards a single object, person and idea or job level. At the other extreme is the definition in which interests are structured out of the individual’s attempts to match his self estimate with the competitive reality of jobs and activities in which he chooses to engage or is forced to engage. Strong (1943) says that interests are the sum total of likes and dislikes for a wide range of stimulus objects and activities. Bingham (1937) writes, “An interest is a tendency to become absorbed in an
experience and to continue it”. Murphy says, “Interests are conditioned stimuli related to goal objects and expressed as likes or dislikes of activities, objects, characteristics or people in the environment”. That means an interest is an expression of like or dislike towards an object or activity of moving towards or away from the object or activity.

The terms “Interest” has been used in many senses. The four most common ways in which it has been used in literature on vocational guidance as given by Super & Crites (1968) are as follows:

(a) **Expressed Interest** :-

This refers to the verbal expression of interest in an object, activity, task or occupation. These expressed or ‘specific interests’ as called by Fryer have been shown by research to be quite unstable in the child and in the adolescent though a fair degree of stability has been found in the expressed interests of adults. The lack of stability is due to the fact that the immature individual’s judgment about liking and disliking of an activity is considerably influenced by other factors associated with the activity rather than by the intrinsic elements of the activity itself. For example, a boy likes mathematics when the fact may be that he likes his mathematics teacher and has no specific interest in the subject itself.

(b) **Manifest Interest** :-

This refers to the actual participation in an activity or occupation. Such type of interest is open to objective observation. If a boy, for instance paints beautiful posters for the school exhibition, we assume that he is interested in artistic activities. The participation, however, may be due to factors other than a real interest in artistic activities, for instance, this may be the one way open to the boy through which he may get himself accepted as a member of a group whom he wishes to join.

57
Similarly, a real interest may fail to manifest itself in activity due to environmental limitations.

(c) Tested Interests :-

This refers to interests as measured by objective tests, as differentiated from inventories which are based on subjective self estimates. Such tests measure interest in different types of activities through specialized vocabularies, the assumption being that interest in a certain type of activity should lead to greater familiarity with the terms related to that type of activities than with the terms related to other types of activities. Green’s Michigan Vocabulary Profile Test is an objective test of interest.

(d) Inventories Interest :-

This refers to interest as measured by lists of activities etc. to which the subject responds on the basis of his liking or dislike. These interests differ from ‘professed interests’ in being more subtle, valid and less subjected to ‘faking’ as in the inventory every possible response to every item is given an experimentally determined weight and the scores on the various items are added to give total scores for various activities. Research has shown interest assessed by this method to be rather stable ‘not only in mature individuals but also in adolescents’.

The interests have certain general features. They are :

(i) Interests are an aspect of personality development shaped by both hereditary and environmental factors.

(ii) Vocation and vocational interests run in similar directions for a large proportion of individuals. The interests of individuals tend to become less varied with increasing age.
Interests and aptitudes are often assumed to go together and interests are inferred from aptitudes or vice versa. The idea behind the presumption is that a person develops interests in the things which he can do well. Aptitude leads to success in a particular activity, the success is followed by extrinsic rewards such as feeling of satisfaction for work completed and completed well.

The rewards bring about feeling of satisfaction and pleasure in the individual and to get feeling of satisfaction and pleasure again, the individual repeats the activity. This desire to go in for the activity again and again is what is called interest.

Research has shown the existence of a low to moderate degree of relationship between aptitudes and interests. This, however, is no proof of a casual relationship between the two. Besides, the relationship is not sufficiently strong to justify the making of inferences about the one on the basis of data about the other.

**Interest, Abilities and Achievement**

There exists a relationship among interests, abilities and achievement. Strong describes this relationship by the analogy of a motor boat with motor and rudder. The motor (abilities) determine the speed of the boat, the rudder (interests) determine the direction in which the boat travels by and the distance travelled by the boat (achievement) is a result of the operation of both the motor and the rudder. That means interest is not a separate psychological entity but merely one of the several aspects of behaviour. Studies have shown that there is a moderate relationship between intelligence and interest, the correlation ranging from +0.4 to −0.4 depending upon the nature of interest. This means that it is difficult for a
person to develop interest for something which he does not have the intelligence to understand.

The problem of educational underachievement may be traced in most cases, to the lack of relationship between the pupil’s ability and his interests. It is no doubt true that often ability is a factor in the development of interests. A child’s success in any task depends upon his ability to perform the task. The achievement of success serves a two fold need. It brings him self recognition as well as self-esteem. Both are satisfying experiences, and consequently, lend a value to the task, attains a special significance in the child’s life. Failure in a task produces the opposite results. The unpleasant effect is transferred to the task and the child develops a dislike for it. In this manner, interests become related to the child’s intrinsic ability or inability to achieve success. But all interests are not by product of the child’s abilities or aptitudes. Interests are also the outcome of the child’s endeavour to satisfy his need for social belongingness and social conformity. The child accepts the norms and values of his social group. This lends special significance to the objects, activities and situations related to those norms and values, either positively or negatively.

Thus, socio-economic and cultural factors also play an important part in the development of interests. The son of a successful medical practitioner often likes to be a doctor inspite of his poor academic ability or his weak scientific aptitude. Similarly, a child’s suppressed hostility for a parent, or the dislike of a school subject teacher, may create in him an aversion for his studies or for a particular subject of study despite his superior ability or aptitude.
Development of Interest

Interests are basically determined by environment and heredity. Berdie believes that sex differences in interest are related to psychological or physical variables. He also reports that measured vocational interests apparently reach a point of relative stability soon after physical and intellectual maturity.

Fryer (1931) is of the opinion that interests are primarily of environmental origin. They appear to have a chance relationship with abilities.

Peter says, family is the greatest single agency in determining vocational choice. School has a great influence on vocational interest. In one group that Berdie studied, 32% reported as the reason for choosing a vocation the influence of a favoured school subject. Another 10% were influenced by their teachers, Berdie believes hobbies and occupations are vital instruments in vocational selection. He concludes, “No one factor, ability, school or work experience plays a large part in determining vocational interests yet all of these factors are related to interests to some extent. Vocational interest is a complex phenomenon resulting from a multiplicity of conditions. Family influences are among the more effective factors, interests and abilities are among the least effective factors”.

Assessment of Interests

Assessment of interests is very important for providing vocational guidance. The aim is to discover the degree to which the individual possesses the general pattern of interests that characterize successful workers in a specific occupation. Strong and others who have been stressing vocational interests inventories base their work upon the fact
that “Men engaged in a particular occupation have been found to have a
characteristic pattern of likes and dislikes which distinguish them from men
following other professions”. The conclusions follow logically that one who
possesses to a high degree the interest that characterize physicians as a group
and possesses to a low degree the interests that characterize engineers as a
group should give weight to this fact in making his vocational plans.

The United States has played the leading role in the
development of measures of interests. The inventories which have been
developed yield scores that indicate interests according to three types of
classification.

(i) Interests in specific occupations
(ii) Interests in families of occupations.
(iii) Interests in broad fields, which may cut across vocational groups.

The outstanding example of an inventory of the first type is
represented by the occupational scale of the Strong Vocational Interest
Blank for Men. Examples of the second type of inventory are the group
scales on the Cleeton Vocational Interest Inventory, Brainard Occupational
Preference Record and the Lee Thrope Interest Tests, the third type is
illustrated by the Kuder Vocational Preference Record.

2.6 ATTITUDES

Attitudes have been defined as ideas with emotional content,
important beliefs, prejudices, biases, predispositions, appreciations and as
state of readiness or set. Allport has defined an attitude as a “mental and
neural state of readiness, organized through experience, exerting a directive
or dynamic influence upon the individual’s response to all objects with
which it is related”. Attitudes have intellectual, biological, social and emotional components that are derived from experience and exercise a determining influence upon behaviour. Any definition that includes all of the connotative aspects implied by the term attitude must be broad and vague, yet it is necessary somehow to limit this discussion to a specific concept. For this purpose, an attitude is defined as a developmental state of organic valence, created by psycho-biological processes, exerting a motivational influence upon the individual’s responsive behaviour in situation directly and indirectly related to it.

A variety of patterns are included in an individual’s array of attitudes. There are attitudes towards health, life, death, people, new situations, music and art, work, play, government, religion and many more that are of like importance. These attitudes have been influenced by the educative process through planned and random experiences. Since creating and shaping attitudes is one of the most important functions of the school, attention should be given to a study of their genesis, nature and dynamic aspects.

**Attitude Formation**

The four major methods namely,

(i) Conditioning and reinforcement

(ii) Incentive and conflict

(iii) Functionalism and

(iv) Cognitive consistency deal with attitude formation

Conditioning and reinforcement model predicts the relationship between a given independent variable and attitude change in terms of the known relationship of that independent variable to learning, on the
assumption that the relationship of the independent variable to attitude change will follow its relationship to the learning mediator. Thus attitudes are considered to be acquired in the same way as facts, concepts, ideologies, ways of thinking and habits are acquired.

While developing the individual acquires information and feeling by the process of association, reinforcement and imitation. Associations are formed when stimuli appear at the same time and in the same place. Learning the characteristic of an object, a person or an idea is obviously an important aspect of developing an attitude towards it (Norman and Anderson, 1964). Having learned the characteristics, the subject also learns an attitude. Several factors may play a part in the establishment of such associations. One such factor is research reinforcement. A prediction that is encouraged by rewards or social acceptance is likely to be enduring. The emotional gratification of the rewards become associated with the object. On the other hand, negative reinforcements – punishment, criticism etc. lead to a negative attitude towards the object. Imitation also plays a part in the formation of attitudes. Just as people imitate the behaviour of others, they might imitate attitudes as well.

According to the incentive and conflict approach, the relative strength of these incentives determine one’s attitude. If the initial attitude was negative, it would become positive only if there is a greater incentive for taking a new position than for maintaining the original one. When there are conflicting goals the individual adopts the position that maximizes his gains.

The functionalist approach states that attitudes are formed because they meet particular psychological needs and functions. Katz and
Stotland (1955) and Katz (1960) have identified four most crucial functions:

(i) The instrumental, adjustive or utilitarian function

(ii) The ego-defensive function

(iii) The value expression function

(iv) The knowledge function

The adjustive function is recognition of the fact that people strive to maximize the rewards in their external excitement and minimize the penalties. The utility of attitude may be its social adjustment value rather than its actual instrumentality to goal attainment.

Ego – defensive function of attitude is the mechanism by which the individual protects his ego from his own acceptable impulses and from the knowledge of threatening forces from within, and the methods by which he reduces his anxieties created by such problems. Many of our attitudes are held more to help us and deal with our inner conflicts than because of any characteristic of the object to which the attitude is directed (Sarnoff, 1960).

Attitudes also serve the function of giving positive expression to individual control and to the type of person he considers himself to be. The value expressive function of attitudes justifies one’s behaviour (Brehm and Cohen, 1962). A person’s attitude, according to his view, changes when he is forced to comply overtly with a new norm. The result is that his attitude is modified to justify the new overt behaviour, the person thus internalizes the new norm.

Lastly an attitude is based on what the person has directly observed and what has been communicated to him by others. An attitude based on this knowledge function should be particularly amenable to change when new information is communicated to the subject or when the subject
has new experiences with the object. In life, the raw phenomenon are too rich to be grasped in all their individualities. We tend to group them into convenient categories and form useful generalities about relationships among these abstract categories by their simplification and relatively univocal implications for action in the face of otherwise overpoweringly complex situation. For instance, social and universal attitudes give us a needed feeling of competence to deal with present and future experiences. This function of attitude was suggested by Lippmann (1922) when he stated that public opinion consisted of an economical simplification of the complex world.

The cognitive consistency method of attitude development and change envisages that if given inconsistency, people will have a tendency to change towards consistency. (Newcomb, 1953). Although people need not be consistent in everything they say or do, contradictions produce conflicts, tension and anxiety until there is a resolution. Heider (1958) states that attitude towards persons and casual unit formations influence each other. An attitude towards an event could alter the attitude towards a person. There is an emergence of a balanced configuration if the attitudes towards the parts of a casual unit, were similar. In Heider (1958) “p-o-x” formation, the person ‘p’ tried to keep his sentiments regarding another person ‘o’ in the line with their mutual liking for an object. Congruity theory which is related to Heider’s balance theory also states that the principle of congruity governs all human thinking. Changes in evaluation or attitude always occur in the direction of increased congruity with the existing frame of reference. In other words, attitudes are changed so that inconsistency is reduced or eliminated and congruity is achieved.
2.7 PARENT CHILD RELATIONSHIP

The Kothari Commission on education has observed in 1964 that the future and fate of India was developing in the schools. This observation clearly emphasizes the important role of schools for the all round development of students. The role of ‘family’ has also been equally praised in the development of the personality of adolescents. With the advances made recently in the field of information technology the importance of ‘family’ has increasingly become very great.

It seems that the adolescents would like to stay more at home. With the spread of T.V. network, big cinema houses are facing economic losses. The expansion of computer technology helps students in creating their own stories at home. Psychologists, educators and sociologists all agree that, whatever, be the structure of schools and facilities rendered by the government, the parents will occupy the most crucial role in the development of the child just as a big grown up tree gives shelter to young saplings and helps them to grow to face the world, its challenges and problems. The values, beliefs and attitude of parents definitely influence the behaviour, growth and outlook of children.

The child is just like clay and parents give shape to that clay according to their own wishes. Parents want their children to be as they are. So, the interests, personality, aptitude, attitude, adjustment, creativity, academic achievement of the child depends upon the relationship of the child with his parents. Parent child relationship is a major aspect in the development of child.

Rejection of parents may have various effects on the child’s adjustment. Symonds (1939) states that when parents reject a child, he is likely to be aggressive, attention getting, hostile, hyperactive and jealous or
rebellious. The child develops a variety of attention getting mechanisms. Maslow (1954) believes that psychological health comes from being loved. A climate of love enables the child to develop more adequate concepts of self, society and the world. Poor parent child relationship is harmful for the person himself and the country too, because the contribution of each and every individual is needed in the progress of the nation.

The parent child relationship on environment has been the object of study and analysis for many years. Present day national involvement with such widespread social problems as ignorance, unequal educational opportunities and social drop-out; have contributed to the development of a new orientation in the study of parent-child relationship.

Bloom (1989) says that the climate of family may be regarded as providing a network of forces and factors, which surround, engulf and play on the individual.

Uniyal and Beena (1989) reported that the word family climate means an interpersonal relationship between the parents and the child. In included the parent’s attitude towards the child related to freedom vs destructiveness, dominance vs submission, acceptance vs rejection, trust vs distrust, warmth vs coldness, partiality vs fairness, expectation vs hopelessness, open communication vs controlled communication. It is also suggested that the development of any particular human characteristics is related to a subset of the total set of the environmental forces.

2.8 BACKGROUND VARIABLES

In the present study, the following background variables have been undertaken.
2.8.1 Sex-differences

No two individuals are similar in this world. An interesting fact is that variations are not only found between the individuals but even within the same individual. The former are inter-individual differences and later are called intra-individual differences. Individual differences are found in men and women. These sex differences are known as inter-individual differences. The intelligence tests have shown that both genders have an average similar I.Q. but some other differences between boys and girls were discovered by McNemar and Terman (1921). On the basis of some studies they have discovered that women have greater skill in memory, making sensory distinction, superior in language, more susceptible for suggestions and men have greater motor ability, excel in mathematics and logic, show greater reaction and conscious of size, weight and illusions, superior in physics and chemistry.

On the other hand, there are studies especially done in recent years, which indicate that there is no significant effect of sex on attitude. Sex has little or no relation to aptitudes, attitudes and abilities. Difference in interest, attitudes, aptitudes and other personality characteristics are becoming fewer in modern society.

Thus, the investigator in the present study tried to find the effect of sex-difference on the development of scientific attitude among children.

2.8.2 Medium of Instruction

Medium of instruction means the medium in which child is getting instruction. In the present study those schools have been selected which impart instructions either in Punjabi, English or Hindi medium.
2.8.3 Type of Management

Type of management in the present study means four types of management i.e. govt. schools, govt. aided schools, private but not getting grant from the govt. and navodaya vidyalayas.