CHAPTER – II

THEORETICAL ASPECTS ABOUT

INDEPENDENT VARIABLES

Theoretical viewpoints about the predictors under consideration are presented in detail so as to get the complete understanding of the rationale and relationship of these variables in the present study.

2.1 EMOTIONAL INTELLIGENCE

Emotional intelligence, like general intelligence, is the product of one’s heredity and its interaction with his environmental forces. Emotional intelligence refers to the capacity for recognizing our own feelings and those of others, for motivating ourselves and for managing emotions well in ourselves and in our relationships. It is often said that a high IQ may assure us a top position, but it may not make us a top person. According to Salovey and Mayer (1990), “Emotional Intelligence is a set of skills hypothesized to contribute to the accurate appraisal and expression of emotions in oneself and others, the effective regulation of emotions in oneself and others, and the use of feelings to motivate, plan, and achieve in one’s life.”

Historically speaking, the term emotional intelligence was introduced in 1990 by two American University professors Dr. John Mayer and Dr. Peter Salovey. They attempted to develop a scientific measure for knowing the differences in people’s ability in the area of emotions. However, the credit for popularizing the
concept of emotional intelligence goes to another American psychologist Daniel Goleman.

In the views of Daniel Goleman (1995), “An I.Q. test is really a single measure of how verbally fluent you are? It is how well you do mathematics and logical reasoning. But a more powerful predictor of how well people will do in life is a measure of their emotional quotient, which taps their emotional and social skills.”

There is growing evidence that fundamental ethical stances in life stem from underlying emotional capacities. The medium of all emotions is impulse and the seed of all impulse is a feeling bursting to express itself in action. The people who are always at the mercy of impulses and lack self-control, suffer from a moral deficiency, because the ability to control impulse is the basis of will and character. One should be empathetic and should be able to read emotions of others. If one lacks this sense, there will be no caring and sharing. Self-restraint and compassion are the moral stances, which are needed by us in the present scenario.

Understanding the interplay of brain structure that rules our moments of rage and fear, passion and joy, helps us learn about one’s emotional habits. These emotional habits help us to subdue our most destructive or self-defeating emotional impulses. The basic flair for living called emotional intelligence is being able, to rein in emotional impulse, to read other’s innermost feelings and to handle relationships smoothly. Our genetic heritage endows each of us with a series of emotional set points that determine our temperament.

Teaching of emotional and social skills is must for children to keep their lives on track. No doubt, childhood is a critical time for
its development. Emotional intelligence is not fixed at birth. It can be nurtured and strengthened throughout adulthood – with immediate benefits to our health, our relationships and our work.

These two different kinds of intelligence – intellectual and emotional, express the activity of different parts of the brain. We have two minds – one that thinks (rational mind) and one that feels (emotional mind). One acts according to his emotional and rational mind. The intellect is based solely on the workings of neocortex, the more recently evolved layers at the top of the brain. The emotional centers are lower in the brain, in the more ancient subcortex; emotional intelligence involves these emotional centres at work, in variance with the intellectual centers.

According to Goleman (1995), “Emotional Intelligence is the ability to motivate oneself and persist in the face of frustrations; to control impulse and delay gratification; to regulate one’s moods and keep distress from swamping the ability to think; to empathize and to hope.” He believes that Emotional Intelligence is a necessary, often neglected, component of success in life. According to Salovey and Mayer (1990), “Emotional Intelligence is the ability to monitor one’s own and other’s emotions, to discriminate among them and to guide one’s thinking and actions.” The reason that Emotional Intelligence has fired such intense public interest is that, unlike traditional ideas of intelligence which posit that intelligence remains relatively static, Emotional Intelligence techniques can be learned. It is not based on a measure of innate ability, socio-economic status or cultural factors. While researchers and practitioners have primarily focused on the development of Emotional Intelligence in children to promote future success, it would seem that adult learners could also benefit
by learning the components of Emotional Intelligence, particularly those involving motivation and social skills.

According to Schutte (2000) “The related construct of emotional competence is a crucial component of social development and contributes to the quality of interpersonal relationships.” Further definitions of emotional intelligence have included cognitive components, “such as emotions aiding judgement and memory” and conceptualizing emotional intelligence as a trait and an ability.

According to Mayer and Salovey (1995), “Emotional intelligence may be defined as (a) The ability to accurately perceive, appraise and express emotions, (b) The ability to access or generate feelings on demand when they can facilitate understanding of yourself or another person, (c) The ability to understand emotions and the knowledge that derives from them, (d) The ability to regulate emotions to promote emotional and intellectual growth.

2.1.1 Emotional Intelligence includes the following characteristics:

1. **Self Awareness:** Knowing your emotions, recognizing feelings as they occur and discriminating between them is being emotionally literate. Being able to identify and label specific feelings in yourself and others, being able to discuss emotions and communicate clearly and directly.

2. **Mood management:** Handling feelings so that they are relevant to the current situation and you react appropriately. Better able to express anger appropriately without resorting to violence, fewer suspensions or
expulsions, less aggressive or self-destructive behaviour; better at handling stress.

3. **Self motivation:** “Gathering up” your feelings and directing yourself towards a goal, despite self-doubt, inertia and impulsiveness. More responsible, better able to focus on task at hand and pay attention, less impulsive; more self-controlled and improved scores on achievement tests.

4. **Empathy:** Recognising feelings in others and turning into their verbal and non-verbal cues. Better able to take another person’s perspective, improved empathy and sensitive to other’s feelings, better at listening to others.

5. **Managing relationships:** Handling interpersonal interaction, conflict resolution and negotiations.

### 2.1.2 Importance OF Emotional Intelligence

Emotions are an important part of one’s personality. They determine the nature and effectiveness of the pattern of social interaction and also contribute importantly to the psychological well being of an individual. An emotionally sound individual automatically avoids a host of other problems related directly or indirectly to the individual’s pattern of emotional responses.

**Building healthy relationships:** A close and loving personal relationship fulfils a fundamental need of self expression of each individual. It adds to the sense of security and the sense of acceptance. Emotional intelligence enhances personal effectiveness leading to healthier and stronger relationships. Emotionally intelligent people are able to express their emotions positively without actually threatening the emotions of other person. Also, the current trends in marriage and divorce make emotional
intelligence more crucial than ever. Emotionally intelligent couples can handle their differences more effectively without blaming each other. Emotional literacy provides a conducive environment for healthy marital relationships leading to happy married life.

**Emotional intelligence at workplace:** Emotional intelligence helps to avoid stress at work place also. Application of emotional intelligence at the work place enables to form a conducive work environment in three important ways, Firstly, it helps to see grievances as helpful critics. Secondly, it helps in creating an atmosphere in which diversity is valued. Thirdly, it enables to create effective networks where differences are respected and people are motivated to work towards a common goal. It adds to group I.Q., ie, the ability of group members to harmonize and work together effectively.

**Emotional intelligence and physical health:** Negative emotions cause distress, which is bad for health. A number of researches point to the harmful consequences of emotional turmoil and the strong relationship between emotional and physical health. People, who experience chronic anxiety, long periods of sadness, and pessimism, unremitting tension, relentless cynicism or suspiciousness, have double the risk of disease-asthma, arthritis, headaches, peptic ulcers, and heart disease. Thus, emotionally intelligent people have better chances of enjoying physical well-being.

**Emotional intelligence is also crucial for effective child-rearing:** Emotionally intelligent parents instill a sense of security and acceptance in their children. They are also able to provide healthy emotional environment for their children. They enable them to acquire the positive traits such as confidence,
cooperativeness, self-control and capacity to communicate. Hence they add to their all round development.

**Goal directedness:** Delaying immediate gratification and being able to concentrate on a goal is an important component of emotional intelligence. Working consistently towards a goal is a pre-requisite for success. Being successful helps in building up a positive self-concept and adds to psychological well being of a person.

**Emotional intelligence and adolescents:** Emotional literacy is also helpful in avoiding a host of problems characteristic of adolescents. Loneliness, lack of concentration, stubbornness, drug abuse, feeling and being unloved and many more are just a manifestation of lack of emotional intelligence. Emotionally intelligent children are better able to distinguish between their emotional states and can express their emotions more effectively. Furthermore, they are able to cope with setbacks and difficulties in a better manner as compared to children who have a limited repertoire for emotional responses.

Being emotionally literate is as important for learning as instruction in mathematics and reading. Emotional Intelligence also helps the learner in the following ways:

**Self-Awareness:** Observing yourself and recognizing your feelings; building a vocabulary for feelings; knowing the relationship between thoughts, feelings and reactions.

**Personal Decision-Making:** Examining your actions and knowing their consequences; knowing if thought or feeling is ruling a decision; applying these insights to issues such as sex and drugs.
Managing Feelings: Monitoring ‘self talk’ to catch negative messages such as internal put-downs; realizing what is behind a feeling (e.g. the hurt that underlies anger), finding ways to handle fear, anxiety, anger and sadness.

Handling Stress: Learning the value of exercise, guided imagery, relaxation methods.

Empathy: Understanding other's feelings and concerns and taking perspective; appreciating the differences in how people feel about things.

Communications: Talking about feelings effectively: becoming a good listener and question asker; distinguishing between what someone does or says your own reactions or judgements about it; sending T’messages instead of blame.

Self-Disclosure: Valuing openness and building trust in a relationship; knowing its sake to risk talking about your private feelings.

Insight: Identifying patterns in your emotional life and reaction; recognizing similar pattern in others.

Self-Acceptance: Feeling pride and seeing yourself in a positive light; recognizing your strengths and weaknesses; being able to laugh at yourself.

Personal Responsibility: Taking responsibility; recognizing the consequences of your decisions and actions, accepting your feeling and moods, following through on commitments.

Assertiveness: Stating your concerns and feeling without anger or passivity.
**Group Dynamics:** Cooperation; knowing when and how to lead, when to follow.

**Conflict Resolution:** How to fight fair with other kids, with parents, with teachers.

Developing emotional quotient skills will serve as a helping hand for problem solving, better productivity, good quality of life and improved performance. The concept of emotional intelligence is an emerging field of research in the area of social, behavioural and management science. If one is emotionally healthy, life will be bright and beautiful rather than dull and dark.

The lapses in emotional skills can be remedied to a great extent and with the great effort can be improved on. And for this, educational institutions should act in such a manner, where a ‘new vision’ should be built up by bringing the head and heart together in the classroom. The journey should not end with the visits to innovative classes where children are given grounding in the basics of emotional intelligence rather education should try to inculcate essential human competencies such as self-awareness, self-control, empathy and the arts of listening, resolving conflicts and co-operation. It should help the child not only to understand himself but also his fellow beings, since getting in touch with your own feelings and empathizing with those of others definitely has benefits beyond measure. Otherwise as Cooper and Sawaf Bupa (1998) said, “Without emotional intelligence, in the medium to long term, you will have less balanced personal life and make lots of enemies”.

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2.2 CREATIVITY

Due to the tendency to assign different meaning to creativity and due to the complex nature of creative experience it is considered vague. (Yamamoto, 1964; Getzels and Dillon, 1973; Barron and Harrington, 1981) e.g. in the past the term creativity was more or less synonymous with terms like intention, insight and imagination. Then other definition of creativity points out that creativity involves the development of something unique, although the uniqueness has not been well defined by different investigators.

Goleman (1963) points to its denotative versatility- "Creativity is a normally distributed trait, an aptitude trait, an intra-psyhcic and a style of life".

According to personological approach, Creativity is related to unique cognitive factors (Guilford 1950) and also dependent upon certain non-cognitive factors (Raina, 1971; Gakhar, 1973, 1975; Gupta, 1979).

According to Guilford (1963), “It is a combination of aptitude factors and disposition that enables a person to use his importance in novel ways”.

According to Israeli (1946), Drevadahi (1956), Stein (1962) and Kavolis (1964), “Creativity is the capacity of the individual by which something new is produced, an idea or an object including a new form or arrangement of old element. In the creative product uniqueness or novelty is the main element. In some definitions of creativity (Stein, 1953; Rogers, 1954), novelty has been viewed in tangible products, but certain others (Stewart, 1950; Guilford, 1964) hold that it can also be present in the intangible products.
Harman (1958) defines it as “The process by which something new is produced, an idea or an object including a new form or arrangement of old elements.” The new criteria must contribute to the solution of problem. Creativity as a process has been advocated by Taylor (1958), Kubie (1958), Vinacke (1960), Yamamoto (1964), Torrance (1962), Rogers (1976), Kant (1976), Brown (1977) and Gordon (1982).

In the views of Wallas (1926) creative process can be divided into four stages; preparation, incubation, illumination and verification. According to Taylor (1958) the Wallas (1926) steps towards creative accomplishment are valid but it is also necessary to recognize the hierarchical levels of creativity which from the lowest to highest are: expressive creativity, technical creativity, inventive creativity, innovative creativity and emerge creativity. Hadamard (1945) identified the four phases in the creative process (i) Preparation (ii) Incubation (iii) Illumination (iv) Verification. (i) Preparation involves an inner urge to solve a problem (ii) Incubation- this is progress a period of no obvious activity and progress. The problem is being solved unconsciously. (iii) Illumination- this is so called “Eureka”. At this stage creative ideas emerged all of a sudden (iv) Verification- it is tested whether new idea found is appropriate or not. The same four stages have been identified by other writers (Patrick, 1937; Poincare, 1931; Arnold, 1959). In Mansfield and Busse’s (1962) Model of creative process, also there are five steps towards creativity. (i) Selection of the problem that is important and potentially soluble (ii) Extended effort to solve the problem (iii) Setting constraints to the solution of the problem (iv) Changing the constraints through a restructuring process and (v) Verification and elaboration of results.
In the views of Torrance (1962) creative process consists of identifying problems, developing hypotheses as to the cause of the problems, find out new solutions, application of those solutions which involve improvement of product and usual uses and finally communicating the results. Verbal creativity according to him can be measured in terms of fluency, flexibility and originality.

Hudson (1966), Torrance (1972) and Vijay Lakshmi (1980) state that socio-economic status may act as an inhibiting/facilitating theories of Kris (1952) and Kubie (1958) emphasize the importance of pre-conscious process. These processes are believed to occur when the ego, with its emphasis on logical, rational thought, temporarily loosens its control of the thinking process so that an unorganized-drive-oriented type of thinking can occur. Gestalt psychologists employ the term “Productive thinking” and problem solving to refer to what others might can creative thinking. The structural features of the problem itself set up stresses and strains in the thinker. By following up these stresses and strains, the thinker is led to a restructuring of the problem. Successive restructuring occur until a solution emerges.

Press also contributes towards the creative process and products as considered by Rogers (1962), Torrance (1965), Hasan and Butcher (1966), Synder (1967) and Goyal (1973) and conditions of psychological safety and psychological freedom should be set up so as to maximize the likelihood of emergence of constructive creativity (Roe 1952, Nuss 1962).

Rogers’ (1954) definition of creativity includes all the four concepts suggested by Rhodes (1961) and Kneller (1965). According to him, “It is the emergence in action of producing
something uniqueness of the individual (Person) on the one hand, and the materials, events, idea (process), people, or circumstances of his life (Environment) on the other”.

The definitions that are given in terms of person, product, process and press (environment) suggests that creativity also includes four things: (1) Transcendence, (2) Originality, (3) Adaptability, (4) Realization.

(1) **Transcendence:** means that creative ideas which transform the generally accepted experience of man by introducing new principles.

(2) **Originality:** means production of idea.

(3) **Adaptability:** is the beneficial change to meet the environment demand, that is, response in order to be creative should be adaptive to or of reality.

(4) **Realization:** is the elaboration of the original ideas or an act.

Finally, creativity is the capacity to devise new ideas and see deeper meaning in object, events, interpersonal relationships and symbolic materials.

### 2.2.1 Nature of Creativity

Regarding the nature of creativity, it has different meanings to different people. There is little conceptual clarity and agreement among the investigators as to the nature of and definition of creativity.

According to the ‘Artist’ - creativity is the ability to raise an emotional need which is conducive to creativity. According to ‘Architect’ - creativity is ability to produce new forms and new approaches and new materials in the functional design.
According to 'Mathematician' - creativity is the ability to solve mathematical problems and also useful in creating combinations and that provides knowledge of mathematical law.

According to ‘Scientists’ - creativity is the ability to provide knowledge and projecting the contrivances, which change the course of human events.

According to ‘Social Scientists’ - creativity is the ability to produce new theories.

As per business point of view- creativity is the capacity to produce fresh, original and valuable ideas. Hallman (1963) explains the five components of creativity, which are- the act, object, the process, the person and the environment.

The creativity act, Hallman says:

(i) Is a whole act, a unitary instance of behaviour;

(ii) Terminates in the production of objects or of forms of living which are distinctive;

(iii) Evolves out of certain mental processes;

(iv) Occurs within a particular kind of environment.

Hallman called the first of these five components as “Connectedness”.

The second component is “Originality”. For the clarification of originality, Hallman (1963) includes four qualities- novelty, unpredictability, uniqueness and surprise.

Third component- is “Process”- in general that “certain unconscious mental processes are responsible for the metaphoric
function of fusing images into new creations”. Creativity has been explained in three ways. As a process:

(i) “as a sequential series of stages of activity;
(ii) as a vertical level of psychological function;
(iii) as types of mental forces”.

Person: is the fourth component of creativity. It is explained in terms of the condition of self-actualization. Self-actualization criterion “identifies creativity with self-formation and therefore implies that unless significant transformation occurs in personality during an activity, that activity will fall short of the creativity”. (Hallman, 1963). Environment is the fifth component of creativity. Hallman explained that openness includes such traits as self-acceptance, sensitivity, tolerance of ambiguity and spontaneity and as the condition of openness which refers to “those characteristics of the environment, both the inner and the outer, the personal and the social, which facilitates the creative person’s moving from the actual state of affairs which he is in at a given time toward solutions which are only possible and as yet undetermined”.

2.2.2 Theories of creativity:

As far as theories of creativity are concerned Spearman (1931) proposed a special intellectual theory of creative performance. Spearman’s point of view that every creative act is a matter of “educing correlates”. A “correlate” is a “fundament” or unit of information, needed to complete a relationship when the relation and other unit are given. Spearman described in his theory that creative thinking depends upon a single factor of intelligence,
one or at the most four (for four kinds of content) out of a possible 120.

**Kris (1953)** developed a “Psychoanalytic theory of creativity”. This is also one of psycho-analytic theories. According to Kris point of view that creative thinking is not conscious and also do not associate creative thinking with unconscious and latter is regarded as stereotyped and restricting. According to him thinking is a function of what they call the preconscious. There is relief from repression so that communication is improved between the id and ego, permitting preconscious development. **Maltzman (1960) and Medmick (1967)** are two proponents of a theory of the associative type. Both evidently their empirical starting point from the finding that a word association test, with weighted scoring for statistical infrequencies of responses, is a measure of individual differences in the factor of originality.

**Medmick (1967)** has proposed (elaborated) a theory of originality which is based upon the infrequency principle. He supposes that in connection with each stimulus word, an individual has a hierarchy of potential responses, each response with its own degree of readiness, when the stimulus comes. In this theory, stimulus-response connections are formed.

**Mansfield and Bussee (1962)** had given two fundamentally different approaches to the study of creativity. First creativity is considered in terms of test performance. The divergent thinking tests developed by **Torrance (1966)** and others to measure divergent thinking abilities have often been used as measures of creativity. Divergent thinking tests use problem that allows many possible solutions. Researchers who use tests to measure creativity assume that the abilities being tested are essential to real life
creativity and persons with high-test scores have high potential for creative accomplishments. Secondly, real life creativity may be measured directly in terms of products such as poems, symphonies, books, inventions and scientific theories.

Associationist theories involve the common assumption that creativity results from unusual or novel associations. (Koestler, 1964; Gruber, 1974; Medmick, 1967) defined the creative process as “The forming of associative elements in to new combinations which either meet specified requirements or are in some way useful”, when highly creative people are asked to respond to a stimulus word then he gives remote or uncommon responses; on the other hand less creative people respond to stimulus word then he gives only common stereo typed responses. The degree of creativity depends on the relative remoteness of the elements used to form the new combination.

Hadamard (1945) theory combines psychoanalytic as well as associationist ideas. According to Hadamard point of view that all thinking is unconscious because thinking can not be observed and reported by thinker himself like Wallas. He proposed four steps in creative process- Preparation, Incubation, Illumination and Verification. Preparation i.e. an inner urge to solve a problem and preparation period is conscious, systematic and logical. Incubation is that period where there is no obvious activity and progress. The problem is being solved unconsciously. Preparation period sets in motion some unconscious thinking processes that are essential to the incubation and illumination phases. The unconscious mind first produces number of associations and then selects only potentially meaningful or fruitful ideas for their beauty or elegance, are allowed to reach consciousness in the phase of illumination. At
this stage creative ideas emerged all of a sudden. Last step in creative process is verification. i.e. it is tested whether new idea found appropriate or not and verification of the value of ideas and establishing its implications is essentially conscious.

**Koestler (1977)** developed a “bisociation” theory of creativity. In bisociation, two independent matrices of ideas come in to contact, but this occurs only sub consciously through a repression to the pre-conscious thinking processes stressed by psychoanalytic theorists.

**Gruber's (1974)** theory draws on the associationists and Gestalt positions as well as on Piaget’s theory of cognitive development. According to Gruber’s point of view that accomplishments are fueled by conscious, purposeful action. Creative thought is preceded by a period of persistent search enquiry. After such a period, idea discovery can occur. Discovery results not from a single association but from a succession of small changes or restructings.

In the present study creativity has been operationally defined as “ the process of sensing gaps or missing elements, forming ideas or hypotheses concerning theory, testing these hypotheses and communicating the results, possibly modifying and retesting the hypotheses” Torrance, (1966). Its measure is the total scores on fluency, flexibility and originality as measured by Verbal Test of Creative Thinking (Mehdi, 1985), Fluency is the ability to call up relevant ideas where the quantity and not the quality is emphasized. It is the total number of relevant responses i.e. the total number of responses given by the subject minus the number of duplicate and irrelevant responses. Flexibility is the ability to produce diversity of idea with a number of shifts. Originality is the
statistical infrequency of responses or the extent to which the responses deviate from the obvious and the common.

2.3 LEARNING STYLES

In recent years, there has been a lot of research on learning styles of students at various levels of education. Learning Styles 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. The concept of learning style has been treated as a potential individual difference that might be employed by the teacher to enhance student's learning. Learning style is simply, the way, method, or approach by which a student learns. Learning Style is the way in which individuals begin to concentrate on, process, internalize and retain new and difficult academic information. Vermunt (1992, 1996) describes the concept of learning style as consisting of four aspects:

1. Processing Strategies
2. Regulation Strategies
3. Mental Models of Learning
4. Learning Orientation

Agarwal (1981) defined learning styles “as sum total of physical, social, emotional and environmental elements which affect and help an individual in the course of learning.” Since there may be a number of combinations of these factors for different persons, there will always be a unique learning style of every individual.
Garger and Gluid (1984) define learning styles as “stable, persuasive characteristics of an individual expressed through the interaction of one's behaviour and personality as one approaches a learning task.”

McDermott and Beitman (1984) stated that “Learning Styles defines, the distinctive ways 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 situation in their analysis.

Keefe (1987) and Schmeck (1988) opined that the term, learning styles customarily refers to the usual cognitive processes through which a learner perceives, codes, organizes and remembers. Styles of learning may also refer to characteristics of the physical environment in which an individual carries on learning.

Dunn and Dunn (1992) define learning styles as those environmental, emotional, sociological and physical characteristics through which an individual learns most easily. In other words, these are the ways in which individual begins to concentrate on process, internalize and retain new and difficult academic information.

In view of Jackson (2002) learning styles are personal qualities that influence a student’s ability to acquire information and to participate in learning experience.

The common theme of all these definitions, as well as several others that exist, is that an individual’s learning style is primarily an interactive process between that individual, child or adult and...
his interaction between the biologically inherent and/or learned propensities, and the specific environmental demands of the particular situation with which the individual is confronted. It is therefore, clear from the definitions that in general, it is a way in which a learner approaches a problem or deals with learning situation.

2.3.1 Classification of Learning Styles

Students in a given classroom may vary not only in the things they know and in their capabilities for learning but also in ways in which they approach and deal with a given task.

It is believed that there are no limits to the different styles of learning. Vermunt (1992, 1996, 1998) distinguishes four different learning styles: an undirected, a reproduction directed, an application directed and a meaning directed learning style. Students characterized 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. Students with a reproduction directed learning style are characterized by study behaviour directed mainly on reproducing what is learnt at examinations, in order to pass these successfully. Students with application directed learning style apply what they learn to actual, real world settings. 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.
2.4 APTITUDE

Aptitude is defined as the specific capacity to do a certain job that is performed by training in that field. Aptitude is a condition or a set of characteristics regarded as symptomatic of an individual’s ability to acquire with training and knowledge, skills such as ability to speak a language, play a musical instrument, electrical ability etc. When we refer to a person’s aptitude for science or music, we are referring to his future vocation too. This aptitude is a present condition having something to do with his future.

Aptitude is a condition or a set of characteristics regarded as indicative of potentialities but one cannot be very sure that a person possessing a particular aptitude is going to succeed later in the job or occupation. Aptitude, as stated, is a present condition and it is very likely to be influenced by other factors. However, one does succeed in the occupation of his choice in the light of his aptitude. It is also true of aptitude tests. Aptitude tests do not directly measure further accomplishment. These make no such pretence. They measure present performance and on its basis we make predictions.

According to Good’s Dictionary of Education(1973), “Aptitude is defined as a special ability, talent and potential capacity for learning a certain mental or physical operation or it is a mental capacity that indicates the probability of success in a particular line of endeavour.”

The following are certain assumptions underlying the concept of aptitude:
1. **An individual's potentialities are not equally strong in all the fields of learning:** A person may be a good lawyer but it does not mean that he is a good scientist or a good politician as well. Similarly, an individual who can draw the figures and lines with ease and expertise, blend the colours in a decorative manner so as to produce a beautiful painting, can prove to be an utter failure while handling test tubes in a science laboratory.

   In the same way, we cannot expect a singer, who has a melodious voice and can sing well to be equally good at playing the different instruments being used in symphony.

2. **Individuals differ from each other in their potentialities:** All the individuals cannot be expected to have a taste and track for the same thing. They also differ in their physical and learning abilities. Thus, failure and success of a person depends upon many other factors including aptitude. Aptitude is an important factor of achievement in a particular field. Now the question arises; Can we identify and isolate aptitude for one field from another field? This is a very difficult question to answer and there may not be a very clear demarcation between different aptitudes.

**2.4.1 Nature of Aptitude**

1. An aptitude is a unique combination of abilities and personality characteristics which predisposes a person to do one kind of work better than another and increases his chances of success in it.

2. An aptitude is not a unitary trait of human personality. For example, aptitude for science involves basic intellectual
qualities like logical learning, abstract thinking, arithmetical reasoning, certain temperamental qualities like interest in experimentation and initiative for invention, personality characteristics like persistence and hard work.

3. Environment influences aptitude though in many cases it has an innate basis. Aptitude of an individual at a particular moment is in all probability dependent upon both heredity and environment. Social heredity has considerable influence on the formation of aptitudes.

4. An aptitude is symptomatic or indicative of one's ability for particular work or job. This ability means fitness, suitability and similar other things.

5. Training hones the innate capacity of a person. At the time of birth, a particular aptitude is present and later on it is trained through education.

6. An aptitude cannot be touched and weighed. It is not a concrete thing. It is an abstract noun. It can only be felt.

7. Aptitude stabilizes in the early years of life but there is no specific time of demarcation after which there is no effect on the formation of aptitudes. Generally, it is considered that aptitudes are formed up to puberty.

8. Each aptitude is independent of the other.

There are many specialized aptitude tests measuring the aptitude for various traits. These are clerical aptitude tests, differential aptitude tests, musical aptitude tests, scientific aptitude tests etc.
Aptitude also plays a very important role in the development of the personality of an individual. Hence, it becomes one of the most important functions of the counsellor to find a particular aptitude in child. By knowing the mathematical aptitude of the child, he can be guided to adopt a profession related to the field of mathematics. Mathematical achievement of a child largely depends upon his mathematical aptitude.

2.5 MATHEMATICAL APTITUDE

As our society becomes more and more dependent on high levels of computer-based technology, it becomes increasingly important that children should grow up with a basic competence and familiarity with numbers and they should feel at home in the world of calculation and computation. Of course, there are many children who easily develop a familiarity with numbers, yet there are also many children who think that mathematics is like learning a foreign language and approach numerical problems with a mixture of confusion and helplessness. Some of these children manage to grasp the concepts in school, by picking up a collection of techniques, tricks and rules of thumb. These may suffice them to get through the examinations, but they may be only hazily understood.

It seems quite possible that children might have difficulty with routines learned at school and yet at the same time be able to solve the mathematical problems for which these routines were devised in other more effective ways. One way to test this idea is to look at children who have to make frequent and quite complex calculations outside school.
It might be the case that the same person could solve problems sometimes in formal and at other times in informal ways. This seems particularly likely with children who often have to do mathematical calculations in informal circumstances outside school at the same time as their knowledge of numbers, which they have to learn at school; is imperfect and their use of them is ineffective. There is also some evidence that informal procedures learned outside school are often extremely effective. Gay and Cole (1976) for example showed that unschooled kepelle traders estimated quantities of rice far better than educated Americans managed to.

There are reasons for thinking that there may be difference between solving mathematical problems learned in school and solving them in familiar contexts out of school. Reed and Lave's (1981) study with Liberian adults showed differences between people who had and who had not been to school. However, it is quite possible that the same differences between informal and school-based routines could exist within people.

Thus, pedagogical psychology has proved that aptitude of children and youth are shaped and developed in the process of activity requiring the utilization of those qualities which form abilities to do that kind of activity.