CHAPTER II
THEORETICAL FOUNDATION
AND
REVIEW OF RELATED LITERATURE
CHAPTER - 2

THEORETICAL FOUNDATIONS

AND

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION:

For any research study it is necessary and important to furnish a convincing theoretical frame work which consists of the support of the latest body of knowledge related to the field of study consequently, in the present chapter an effort has been made to provide the necessary theoretical frame work. The section deals with creativity, achievement motivation, mental ability, and classroom climate and the related aspects of the above mentioned variables. This is followed by a discussion of the relationship between the variables under study.

2.2 CREATIVITY:

The concept of creativity and the question of its nurturance has evoked considerable interest among researchers in education and psychology, all over the world and has become vitally important now owing to extensive revision of curriculum and teaching techniques.

According to F. BARRON(1963) who studied creative thinking in adults over a period of several years the making of thoughts
is the most common instance of psychic creation. A man may generate an idea that is totally new for him but is commonly known when all human beings are taken into account.

"All of us are both creatures, and creators, but we vary both in our quality as creation and in our power to create".

2.2.1. ORIGIN OF STUDY ON CREATIVITY:

Although geniuses in various fields of human affairs have always been recognised and usually highly valued it was not until Galton's studies of men of genius (1869) that the eyes of natural science were turned upon them. Galton tried to understand the hereditary determination of creative performance. His study became a classic, but he failed to reach uncontestable conclusions.

Reaching an understanding of exceptionally creative people and of the mental operations by which creative productions are achieved should have been the responsibility of the psychologists. But early psychologists were having such difficulty with more simple, mental events such as sensation, perception, and memory that they had neither time nor the courage to tackle problems of creativity.
Only two writers (Scholer 1930, Gulford 1939, 1952) devoted a chapter to the subject in the field of psychology.

2.2.2. PSYCHOMETRIC INTERESTS IN CREATIVITY:

One kind of psychologists could not avoid the problem of creativity completely; for they dealt with many characteristics in which one person differs from others. Among those characteristics are those that prepare some individuals for higher levels of performance including invention and innovation. The first successful test of intelligence from Binet to Terman and others, were aimed at prediction of academic achievement, at the elementary level, where almost no attention was given to self-initiated ideas when it came time to evaluate achievement.

The selection of abilities to be measured in the first Stanford revision of the Binet Scale omitted those abilities especially relevant to the assessment of creative potential. Terman (1906) administered to two extreme groups (of seven each, out of five hundred subjects) who had been ranked for brightness versus dullness by their teachers; a set of experimental tests, one of which he recognised as a test of ingenuity. The ingenuity test failed to discriminate the extreme groups, but all the other tests were successful in doing so. Thus over the years,
tests of creative qualities have been almost non-existent in intelligence scales.

The lack of correlation between tests recognised as belonging in the creativity category and tests common to intelligence scales were noted in isolated studies over the years. Even before Terman's experience with an ingenuity test, Dearbory (1898) had found the relative independence to be true for his tests involving "productive imagination". (Over the years replications of such findings were reported by Chassell (1916) Andrews (1930) and Welch (1946). Terman could have used Dearborn's findings as evidence supporting his own conclusions that inventive qualities were outside the realm of intelligence, where the latter pertains only to basic academic potential, or he could have reached the more recently demonstrated conclusion that intelligence broadly conceived, embraces several components, some of which, at least, do not correlate very much with others. But, the prevailing notion was that intelligence was a monolithic ability, all relevant and unanalyzable.

2.2.3. ANECDOTAL STUDIES OF CREATIVE PERFORMANCE:

Wallas (1926, 1945) Hadamand (1945) and Ghiselin (1952) Rossman (1931) made a more systematic study of inventors, utilising a Questionnaire approach, recording instances of
discoveries in science, literary products, and other examples of output from recognised creative geniuses.

The most fruitful outcome of the study of creative episodes was a list of the stages of thinking that a creator typically exhibits in the total processes beginning with the realised need for creative effort to the "wrapping up" of the final product.

2.2.4. DEFINITIONS OF CREATIVITY:

Psychologists have tried to define creativity in terms of:

(i) a capacity to do things or produce something of a particular nature;
(ii) a mental ability consisting of many component abilities; and
(iii) a subjective experience or process having special characteristics;

A few definitions are given below:

Simpson (1922) defined Creativity as the "initiative which one manifests by his power to break away from the usual sequence of thought into an altogether different pattern of thought."

Wilson (1951) offered an operational definition of Creativity synthesising the diverse meaning of creative process prevalent at that time and described creativity in terms of:
(a) the outflow of individual or group, through which a product is structured;
(b) an action of the mind that produces a new idea or insight;
(c) the mental process of manipulating environment which results in the production of new ideas, patterns or relationships;
(d) the capacity to produce through thought or imagination, capacity for original work,
(e) the emergence in action of a novel relational product growing out of the uniquesences of the individual on the one hand, and materials, events, people or circumstances of his life on the other;
(f) the mental process that involves a rearrangement of past experiences with possibly some distortions in to new patterns to better satisfy some expressed or implied need;
(g) the process which results in novel work that is accepted as tenable or useful or satisfying by a group at some point in time; and
(h) the process by which something new is produced—an idea or an object including a new for or arrangement of old elements.
According to Arnold (1953) "Creativity involves the rearrangement of past experiences, with possibly some changes, into new patterns to satisfy some expressed or implied need".

Rogers (1954) defined the creative process as "emergence in action of novel relational product growing out of the uniqueness of the individual on the hand and the materials events, circumstances of his life on the other".

Drevdahl (1956) considers creativity as the ability of human beings, to produce conclusions of a discretionary kind which are essentially new and were previously unfamiliar to the one who produced them. This can involve a synthesis of ideas which is more than a collection of thought. Drevdahl means by creativity, the formation of new systems and new combinations from known information as well as transference of known connections to new situations and forming of new correlations. A creative activity should be purposeful and directed. It should not be useless and fanciful - although the product does not have to be immediately of practical use nor perfect or absolutely complete. It can assume an artistic literary or scientific for or be connected with the implementation of technology of a methodological kind.
Mendick (1962) defined creative thinking as "... the forming of associative elements into new combinations which either meet specific requirements or are, in some way useful. The more mutually remote the elements of the new combination, the more creative the process of solution".

According to Torrance (1962) "Creative Thinking" is the process of sensing gaps or disturbing, missing elements, forming ideas or hypotheses concerning them; and testing these hypotheses". Subsequently, Torrance (1966) redefined Creativity as, "... a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies and soon identifying the difficulty; searching for solutions; making guesses or formulating hypotheses and possibly modifying and retesting them; and finally communicating the results".

Mackinnon (1970) remarks that Creativity is a multifaceted phenomenon.

In the view of ... Wallach and Kogan Creativity is an aspect of thinking in terms analogous, with Mednick. Creativity is an individuals' capacity or ability to generate cognitive associations in quality and with uniqueness.

Wallach and Kogan laid stress on a playful permissible attitude towards the Creative task which is independent of any temporal pressure.
The above definitions highlight different aspects of the phenomenon of Creativity.

2.2.5. CONCEPT OF CREATIVITY:

Some of the definitions pertaining to Creativity reveal the various aspects of the phenomenon. Creativity is considered a multi-variable phenomenon. The different perspectives that have been adopted to study Creativity functions denote that we are confronted with a highly complex phenomenon. The fact that McPherson (1960) collected 26 different definitions of Creativity and that Mednick (1964) could get 395 different meanings in response to a stimulus word 'Creativity' discloses the diverse nature of Creativity.

There are four approaches to the phenomenon of Creativity, namely

1. A product Approach
2. A Process Approach
3. Environmental Press Approach
4. Personality Profile Approach

2.2.5. A PRODUCT APPROACH:

Wertheimer (1945) considers Creative thinking as productive thinking. Luthe (1976) is of the opinion that this newness in creative product should come from 'within' the creator. He defines Creativity as the 'ability and facility
to actually produce, make or express something that at least in part is originated from oneself'.

Flagnan (1963) believes that creativity is manifested by bringing something new into being. He emphasises on the newness and lack of previous existence of the idea or product. He distinguishes creativity from productivity and ingenuity.

Bruner (1962) insists on newness, surprise and originality in creativity.

Jackson and Messick (1965) suggested four criteria to judge the creativity in the product, novelty being the first criteria. Other criteria are appropriateness, transformation and condensation. It is rather difficult to meet with all these requirements for any product to be called creative.

Parnes (1976) believes that creative behaviour demonstrates both uniqueness and relevance in its products. The product may be unique and relevant to a group or organisation, to society as a whole or merely to the individual himself. Creativity is thus a function of knowledge, imagination and evaluation.

This point is further elaborated by Parnes. He maintains that one has to manipulate knowledge by combining and
re-arranging the facts in to new patterns i.e., new ideas. He thinks that the essence of the concept of Creativity is new and relevant associations of thoughts, facts, ideas, etc. Creativity depends on one's ability to interrelate not only what one already had accumulated, but also the new data which are constantly drawing in through the different senses. The effectiveness of creative productivity also depends on the evaluation and development of embryonic ideas in to usable ideas. Without the ability to synthesize, evaluate and develop our ideas, we achieve no effective Creativity. (Parnes, 1978)

Thurstone is not for judging Creativity according to the usefulness of the product. The criterion of social appreciation of the meaningfulness and novelty of the product is not necessary as it does not make any difference whether society regards the idea novel or not.

Guilford asserts that novelty need apply only within the frame of reference to the person himself (1964)

Margaret Mead expresses her satisfaction if the child evenrediscoveresa principle by himself, and considers him as creative as the original discoverer, though the child's contribution to the cultural tradition is zero (Mead, 1959)
2.2.2. A PROCESS APPROACH:

Foshay (1962) considers the product as a part of the creative process. He postulates four major aspects of this process: Openness to one's own experiencing, focusing of one's experiencing, the discipline of one's actions to work out the focus and closure.

Openness involves suspension of judgement since to judge is to structure. The movement leads to focus. After repeated oscillation from openness to focus a stage comes in where upon a concentrated focus is obtained. In creativity, an attempt to focus implies a deliberate attempt to refine the data that have been let in. To focus is to differentiate, to impose form on formless. It is a proximate test of the possible meaning of some data. An attempt to focus may be made consciously or impulsively, or by insight.

After attaining focus production begins and is fashioned out in a disciplined way. Discipline for the creatives is adopting a way of working that is appropriate to the focus they have committed themselves to as a rejection of distraction from within. The work they carry out is self-defined,
self-imposed and self-disciplined which culminates in a product, the end of the process.

Since creative behaviour involves self from beginning to end, the act of closure of the creative process may be regarded as an act of self-discovery. Frequently, the point of closure is implied by focus adopted but is not fixed by it. Probably, the more complex and novel the effort, the less fixed is the point of completion and the more responsive it is to purely personal and aesthetic criteria. (Foshay, 1962)

Schachtel (1959) opines that creative experience primarily consists in the openness during the creative endeavour and in the repeated and varied approaches to the object, the free and open play of attention, thought, feeling, perception etc., In this free play, the person experiences the object in its manifold relation to himself and also tentatively tries out, as it were, a great variety of relations between the object thus approached and other objects, ideas, experiences feeling, etc.,

Maslow's work on creativity discloses the view that creative thinking involves pre-conscious rather than conscious process. For the purpose of sampling checking, correcting, communicating, etc., Conscious processes are important.
He argues that the information are acquires is never more than a weighted sample of the total input. This point bears a high degree of relevance to psycho-physiology.

Other eminent thinkers such as Govdon (1961), Gowan (1972) and Torrance (1975) attribute important role to emotional non-rational factors in outstanding creative achievement. They hold the opinion that there are different states of consciousness other than ordinary awareness like regression, mediation, reverie, day-dreaming, internal scanning, hyper-alertness etc., in which great inventions, discoveries and other creative works occur.

Kubie (1965) subscribes to the view that creativity is possible only when preconscious processes predominate.

Maslow considers the ability to become lost in the present to be a 'sine Qua non' for creativeness of any kind. He describes what happens in the creative experience in the following terms:

1. Giving up the past and future;
2. Innocence, to receive whatever happens;
3. Narrowing of consciousness - free from other things and becoming the real identity,
4. Loss of ego, self consciousness and self-forget-fullness;
5. Inhibiting force of consciousness;
6. Disappearance of fears; feeling of strength and courage, lessening the defences and inhibitions;
7. The positive attitude, giving up criticism;
8. Trust in self and the world;
9. Taoistic receptivity, permission to dip in to the primary process;
10. Aesthetic perceiving rather than abstracting
11. Fullest spontaneity and expressiveness of uniqueness; and
12. Fusion of the person with the world.

(Malsow, 1967)

A number of prolific inventors were studied by Rossman (1931). He proposed the following set of steps of the inventive process:

1. Need is felt
2. Problem is formulated
3. Information is surveyed
4. Solutions are formulated
5. Solutions are critically examined
6. New ideas are formulated
7. New ideas are tested and accepted.

Basic to these different descriptions of creative process are the classical steps suggested by John Dewey (1910)
and Graham Wallas (1926). Wallas suggested the following four stages of creative thinking process:

1. Preparation: Collection of information
2. Incubation: Unconscious work
3. Illumination: Inspiration of solutions, ideas etc.
4. Verification: Evaluation and testing of solution, ideas etc.

These steps need not follow the same sequence and there may be overlapping of the steps.

Preparation is the stage during which the problem was investigated in all directions; Incubation is the stage during which one was not consciously thinking about the problem. Illumination consists of the appearance of the 'happy idea' together with the psychological events which immediately proceeded and accompanied that appearance. Verification is the large stage which involves both elaboration and evaluation.

It is agreed that a good supply of information is required for creative functioning. Information is necessary though not sufficient for creative production. Preparation refers to the person's total acquaintance with the problem or object, his total previous experience.
The preparation stage includes recognition that a problem exists, acquisition of necessary skills and background knowledge, and appropriate motivation and aptitudes.

The term incubation is used to describe the phase of apparent quiescence when the creator is not actively working on his problem.

Illumination refers to the creative experience, the point at which the solution occurs to the creator.

The term 'Verification' is used for everything that follows: (i.e.)

The scientist testing his hypothesis; the musician writing out his composition; the mathematician working out the minor but perhaps intricate details of his discovery etc.

Although Wallas scheme provides no more than an inadequate descriptive framework it is perhaps the nearest psychologists have yet managed to get to understanding the nature of the creative process. Several examples of creative events in the lives of creative persons such as Einstein, Pioncare's, Faraday etc. clearly indicate that intuitions, inspirations, illuminations, solutions, and other developments
leading to the creative product came to awareness during this passive concentration in association with openminded attitude of passive acceptance, rather than while concentrating actively on the task at hand (Haftmann, 1967)

Inspite of passivity there is always an urge persistent and strong to create.

Incubation stage ultimately ends with a flash of illumination. The time gap regenerates a kind of motivation and propels the inventor to give a new start, or a new strategy, (Patrick, 1935)

Rogers (1959) calls this moment of inspiration as 'Eureka feeling'.

During intuition these is an abundance of controlled thinking, a resort to free association in a kind of daydreaming state, and at the ned, comes a flash of genius'. (Beveridge, 1950)

Rogers says that the process seems to be unknowable and indescribable owing to the suddenness and the unconscious nature of the inventor.

Many experimental studies have brought to light the phenomenon of illumination.

Willingness to resort to intuitive solutions (Westcott, 1956) and the conditions under which insights occur (Snapper, 1956)
have been indicated. Several conditions like previous experience (Mc Geoch and Irion, 1952) level of motivation (Birch, 1945) mental disposition at the time of illumination (Poincare, 1913) etc., have been pointed out. There is unanimity of opinion that lack of distractions and inhibiting interruptions are important conditions for the period of illumination.

Poincare observed that the unconscious work was not possible, or in any case not fruitful unless it was first preceded and then followed by a period of conscious work.

Maslow ascribed hard work in the creative process. He says that the impression that creativeness consists of lighting striking one on the head in one great glorious moment is misleading.

Gordon agrees with Maslow. Gordon believes that hard work to get thorough knowledge of material is essential and only through this thorough familiarity with the field, creativity arises.

For Osborn (1966) creativity is more than mere imagination inseparably coupled with both intend and effort.

Evaluation in creative thinking is an unavoidable step if any of the creative product ultimately is to be of any use.
to a community. It's a part of the creative process. Creativity is considered to be a function of knowledge, imagination and evaluation and creative productivity is a function of knowledge, manipulated, evaluated and effectively developed into usable ideas (Parnes, 1972)

Bruner describes creative learning as 'encompassing acquisition, transformation and evaluation'.

But Guilford asserts that evaluation is always there right from the beginning throughout the creative process.

2.2.5. ENVIRONMENTAL PRESS APPROACH:

The conceptualization and assessment of human environment has become an important area of theoretical and methodological concern of researchers. Situational variables account for the significant amount of behavioural variance has been demonstrated by a growing body of knowledge.

As far as environmental correlates of creativity are concerned researchers are perhaps more in dark about environmental conditions which facilitate creativity that they are about any other aspect of the problem. Beyond obvious conditions such as the need for ample time in which to work freely on problems
Creative thinking process has been considered as bipolar in which there is an interaction between a person and the environment in which he exists. Chambers (1973) regards creativity as a multi dimensional process of interaction between the organism and its environment that results in the emergence of a new and unique product. Parloff (1972) advocates a similar view. He assumes that creative performance is a function of a complex interaction among such factors as personality structure, environmental influences and cognitive capacities. (1972) Piaget (1962) conceives that every act of thinking implies a balance between one's assimilation of the outside world to one's needs and one's accommodation of oneself to the demands of the outside world. When this balance is broken in favour of accommodation, the child imitates reality. When the balance is broken in favour of assimilation, the child enters the realm of symbolic play - the realm of creative imagination. "Imagination play is a symbolic transposition which subjects things to the child's activity without rules or limitations".

Thurstone had a staunch belief that creativity can be encouraged or discouraged by environmental conditions.
Schachtel (1959) and Kubie (1965) adduce experimental evidence to show that creative behaviour can be developed by the environment being controlled in appropriate ways.

Dye (1964) came to the conclusion after her exploratory study that the history of civilization suggests the interdependence between creativity and democratic climate. Freedom and order, properly proportioned are necessary adjunct for emergence of creativity. A democratic climate provides a highly balance combination of the two. It provides enough freedom to challenge the creative potential of an individual and enough order to provide the means to actualise it.

School culture is an important determinant of the Creativity of students. The teacher occupies a vital role in providing conducive climate for the growth in the classroom.

Getzels and Jackson (1963) have reviewed correlates of successful teaching in relation to personality traits, interaction patterns and teaching styles of "successful and "Unsuccessful teachers".

This approach seems to suggest that exciting informative classroom learning depends in part on the intellectual climate.
of the classroom. A 'Laissez Faire' type non-directive, relatively unstructured environment seems to be favourable for creative development. (Drever, 1964)

Ezlkeil (1966) found democratic school administration fostering creativity and initiative in teachers and broadening understanding on the part of all concerned.

Rastogi (1967) and Chattergee (1970) identified students of well equipped and advantageous schools better on creativity tests than students of ill equipped schools.

Aaron et al (1974) did not find any significant difference in creativity scores of students under rural and urban schooling.

Malburg (1970) failed to trace any significant difference in creativity of fifth grades in different classroom climate.

Connor (1960) found out that the conditions within the class are largely responsible for the classroom climate. The classroom with good climate was found by Connor to have more warm and friendly interaction better teacher - pupil rapport, more opportunities for free self expression, relaxed confiding students, more interest and enjoyment for the students. Freedom of expression and recognition of student ideas are the additions made by Enochs to this enumeration (1965). He found that the classroom in which pupil can express ideas, ask
Questions and have their ideas accepted, classified or in some way recognised by the teacher, is a classroom which promotes original ideas.

Bowers (1965) lodges the following opinion. To feel free to express one's ideas implies the provision of an emotional atmosphere which is safe to experiment with one's behaviour, safe enough to make mistakes without risk of being punished. Safely and affection are ranked high in the hierarchy of human needs. "Individuals have ideas but they are reluctant to express them. They have to be provided with a psychologically secure and free environment, explicitly or implicitly".

Group pressure to conform is a chief source of danger to this safety. Creative people conform to group pressure in a lesser degree than the less creatives. (Asch 1960) (Crutch Field 1963, Kumar 1972) but the less creatives cannot enhance their creative potential with group pressure.

Studies conducted by Mc Keachie (1974) on student-centred versus teacher-centred interactions reveal conflicting results. The reason for this seems to lie in the fact that the teacher centred classes are more concerned with course content and achievement while student-centred classes are primarily concerned with individual development and emotional needs.
Home and family environment has been indicated as a major influence on creativity of the child. The conditions under which the child grows in the family are vital to the growth of his creativity (Haronian and Sufarman, 1967) Saran, in his study of personality traits of nursery school children found that individual development of a child with regard to curiosity, creativity, constructiveness, and practical competence largely depends upon the proper home environment (Saran 1970) Getzels and Jackson drew similar conclusion.

Family background of parents their social positions, feeling of superiority professional background and vocational independence also seem to affect child's creativity (Roe 1953; Weisberg and Springer 1961; Oden 1968)

The import of the studies on environmental correlates of creativity is that factors like democratic conditions in group work, freedom of expression and movement, lack of fear of failure and provision of psychological safety, non punitive provisions, encouragement and motivation, playfulness, breaking the barriers of conformity, recognition to individuality, family environment, child rearing practices, parental treatment and family background play very important role in proper nurture of creativity of an individual.
2.2.5. PERSONALITY PROFILE APPROACH

An attempt to study creativity in relation to personality characteristics was made by Weisberg and Springer (1961 and Torrance (1962). Weisberg found highly creative children rated higher than less creative ones on strength of self-image, case of early recall, humour, availability of oedipal anxiety and uneven ego development. Weisberg considered humour as one of the best discriminators between most divergent and least divergent people Hudson (1967) regards 'humour' as a distinguished characteristic of creative people. He attributed 'avoidance of humour' among convergers to their general tendency to 'compartmentalise' experience.

Malson inferred that a creative person was a self-actualising person with a good psychological health.

Torrance gave evidence to 84 personality traits that have been demonstrated to correlate with creativeness of children (1963)

Rauba (1968) found the highly creative high school students exhibiting greater achievement, autonomy, dominance change and endurance than low creative students. Parmesh (1969) found the creative children to be neither extroverts nor introverts and also to be neither high nor low on neuroticism and characterized by high theoretical and aesthetic values.
Pauchaury (1975) investigated into the teachers's perception of creative pupils. The teachers were found to value, curiosity, courageousness in convictions and independence in thinking and in judgement in creative children.

Nair and Baby (1977) in their factor analytical study of personality variables related to high and low creative thinkers found social adequacy, feeling, school inadequacy feeling and personal inadequacy feeling as the dominant factors.

Sharma and Sharma (1969) compared a group of artists with non-artists in order to test analytic hypotheses concerning the personality of artists. They concluded that the artists have a greater conflict with parents their parents reject them more often and as such they have less affiliation with their parents. They are less overtly aggressive and have a greater guilt sense.

In the words of Taylor and Holland (1964)

"There is some evidence that creative persons are more autonomous than others, more self-sufficient more independent in judgement, more open to the irrational in themselves, more stable, more feminine in interests and characteristic, more dominant and self-assertive, more complex
more self-accepting, more resourceful and adventurous, more radical, more self-controlled, and possibly more emotionally sensitive, and more introverted but hold.

Mackinnar (1963) described the creative person as intelligent original, independent in thought and action, open to experience both of the inner self and the outer world, intuitive, aesthetically sensitive and free from Crippling restraints, having high energy level a persistent commitment to creative endeavour and a strong sense of destiny which includes a degree of resoluteness and a measure of egotism.

Carl Rogers (1959) stresses the ability to toy with materials and the capacity to be puzzled as creative personality attributes.

Tyson (1966) considers independence originality openness intuitiveness, playfulness and a sense of destiny as characteristics of highly creative people.

Cricket (1967) observes that highly creative individuals are characterised in the cognitive domain, by possession of wide categories willingness to take risks, willingness to 'have a go' and by high levels of flexibility.

**ASSESSMENT:**

Identifying creative potential is crucial problem related to creativity. Different investigators use different
types of criteria to assess creativity Getzels and Madaus (1969) summarized them under the following categories:

1. Achievement - Highly recognised achievement like a Nobel prize or any other mark of outstanding accomplishment as an index of creativity.
   
   (Ghiselin, 1952)

2. Ratings - Evaluation by peers, teachers, supervisors, experts etc. (Mackinnan 1964, Drevdanl 1964)

3. Intelligence - Performance on intelligence tests. Superior IQ as a criterion.
   
   (Terman 1925)

4. Personality - Evaluation of personality characteristics in relation to a priori profile of creative personality. (Gattell and Drevdane 1955)

5. Creativity - test - Scores - Performance on the creativity tests such as those developed by Flanagan (1958) Bubl (1960), Guilford and Mednick (1964) Torrance (1966) and others.

A survey made by Chauhan and Tiwari (1974) found that inkblots, observations and drawings were frequently used to assess creative ability of children. For assessment of
creativity amongst adolescents and adults researchers were seen to use poems, sketches, essays and stories written with the help of pictures, work construction, plot titles, inkblots, unusual uses, consequences, Mosaic tests, etc.,

Foster (1971), Statuts (1973) and Scharfs (1973) were not able to find the self, peer and teachers ratings an effective measure of creativity. The halo effect in ratings is a particular by the technique of rating. Moreover, the projective techniques need the help of expert to analyse the responses and the products like stories, pictures poems etc. Hence various test are preferred.

Thorndike (1963) maintains that creativity test correlate as highly with measures of the more traditional intellectual abilities as they correlate with one another.

But the studies of Thurstone (1952), Gulford and his associates (1954), Getzeis and Jackson (1962) Torrance (1962) Parmesh (1971) Passi (1972) Mehli (1973), Patel and Joshi (1976), Gakhar and Kaura (1977) have shown that creativity and intelligence are two distinct abilities with different factors and are 'lowly positively related with each other'
2.2.6. ASSUMPTIONS ABOUT CREATIVITY:

Ellis D. Erans and Body McCandless (1904) discuss creativity in the light of five basic assumptions.

First, it is generally assumed that creativity is an aspect of intelligent behaviour that can be expressed in a variety of ways at a number of levels. For example, just as a nuclear physicist or a jazz composer can be creative in the laboratory or music room. So can a cook in the kitchen.

Second, it is assumed that all children and youth possess creative abilities to some degree. One person may demonstrate creative abilities more often than another, but none one completely lacks them.

A third assumption is that creative abilities can be developed under the "right conditions". The exact nature of these facilitating conditions may not be the same for any two children or adolescents, but it seem clear that some general conditions apply to most people.

Fourth, it is assumed with Piaget, that development of creativity abilities is a prime educational goal. This assumption raises some sticky issues, including how to achieve a balance between the intellectual conformity necessary in a society and individual tendencies towards the unconventional. This assumption also requires that one must have in
mind the specific behavioural components of creative expression so that independence or mediation is not confused with destructive rebelliousness or indecision. Creativity is a valuable part of human development that must be nourished and encouraged within the schools.

Fifth, it is assumed that creativity, (with its central component of divergent thinking) and measured intelligence (with its central component of convergent thinking) are not one and the same.

2.2.7. CREATIVITY TESTS:

Guilford's D.P. tests and Torrance's Test of creative thinking are very prominent among the tests of creativity.

Based on Guilford's conceptualisation of creative thinking or on the line of Torrance's Test Model abundant tests of creativity have been developed by researchers in
Majumdar (1973) has developed the creativity tests battery to measure scientific creativity for the science Talent search scheme of National Council of Educational Research and Training, New Delhi.

Passi (1972) developed a battery of creativity tests to measure verbal and non-verbal factors of creativity of the higher secondary school students. The battery consists of six sub-tests (both verbal and non-verbal). The sub-tests are (1) Seeing problems, (2) Unusual uses, (3) Consequences, (4) The test of inquisitiveness, (5) The square puzzle test and (6) The blocks test of creativity. Fifteen different scores like fluency, flexibility, originality, persistency etc., can be derived from the test battery. The reliability quotients by different methods range between 0.68 and 0.57 for the six sub-tests and the factorial validity of the tests against factors viz. Verbal creativity and Non-Verbal creativity ranged from 0.31 to 0.75 percentile norms for all the Six sub-tests are established.

Another widely used test of creativity is that of Baquer Mehdi (1973). Mehdi developed his test battery following the pattern of TTCT. It consists of four Verbal tests Viz.
consequences, unusual uses, similarly and product improvement and three non-verbal tests Viz. Picture completion, Triangles, and Ellipses. The reliability quotients estimated by test - retest method are 0.959 and 0.946 and the validity Quotient obtained against teacher ratings are 0.390 and 0.385 for verbal and non-verbal tests respectively. Percentile norms for grade VII and VIII are provided. The test battery can be administered over a wide age range of sample from middle school to graduate level.

Ramachandrachar (1975) has developed a test developing four matrices. The test is known as Ramachandrachar creative Response Matrices - RCRM. Creative Response Matrices and creative Response Matrices 2 V1 CRM₁ and CRM₂ contain visual Figural stimuli of varying ambiguity and complexity. The subjects are required to write in the blanks provided in a row against each figure as man title - like description as possible.

CRM₃ contains letter duplets. Each duplet is to be converted into as many triplets of equal sum as possible in two minutes. The letters are to be selected, from the given set of nine letters each of which has a definite numerical value assigned. CRM₄ contains sets of five single digit numbers. Each set is to be used in combination with the four
fundamental arithmetical operations in a given fashion as many times as possible in four minutes to get positive round numbers as end product every time.

2.2.8. FACTORS OF CREATIVITY:

Tests for creativity are supposed to measure various factors of creativity. Thomas (1965) considers creativity as synonym to novelty or uniqueness, i.e., originality. Mackinnon (1961) defines originality in terms of statistical frequency - infrequency of the idea. According to him, original idea means the idea which is statistically infrequent or rare.

Wallach and Kogan claim (1965) that an individual's creative potential is affected by two basic variables. The number of associations the person can generate in response to given tasks and the relative uniqueness of the associations that he produces. In addition to originality Wallach and Kogan suggested another factor, i.e., fluency.

Guilford also considers originality as a prominent factor of creativity. Other factors hypothesized by Guilford are related to fluency (word, ideational, asso-
ciational and expression) flexibility (spontaneous and sensitivity to problem. Guilford believes that these are the intellectual factors which form a pattern i.e., creativity.

Whatever may be the approach to the study of creativity, the following components of creativity are generally recognised:

1. FLUENCY - the facility with which many ideas can be generated.
2. FLEXIBILITY - the number of different principles, strategies or approaches used in response to a task, or shifts in response.
3. ORIGINALITY - Uniqueness of response, the response which is statistically uncommon.
4. ELABORATION - the number of details supplied beyond those necessary to communicate a basic idea.
2.2.9. CORRELATES OF CREATIVITY

1. CREATIVITY AND INTELLIGENCE:

The relationship between creativity and intelligence has been a point of controversy since a long time. It seems this controversy centres around two standpoints viz (1) Creativity is a distinct aspect of intellectual functioning which is for all practical purposes independent of conventional intelligence, and (2) it depends upon unique cognitive factors which function within the hierarchical structure of intelligence proposed by Vernon (1951), (Poster, 1971, p.17)

The first standpoint is subscribed by Guilford (1950) Wilson et al. (1954), Getzels and Jackson (1962), Torrance (1962a), Taylor (1964), Yamamoto (1961), Wallach and Kogan (1965). They have claimed that Creativity and intelligence are two distinct mental abilities each involving a special cluster of skills. This viewpoint derives support from the empirical evidence obtained in the correlational studies, inland and overseas, where low relationship between creativity and intelligence was found (Torrance, 1962...
Richards et al., 1964, Guilford and Hoepfner, 1966; Passi, 1972; Mehdi, 1973; Patel and Joshi, 1976); and through the factor analytical studies indicating separate factors of the two (Wallach and Kogan, 1965; Cropley, 1966; Guilford, 1956; Kogan, 1971, Gakhar and Kaura 1977).

Some of the studies found no relation between creativity and intelligence at all. (Clark et al, 1965; Circirelli, 1965; Essenman and Robinson, 1967; Madaus, 1967; Cropley, 1968). Torrance (1967) summarised the results of studies involving 114 correlations with the figural and 88 with the verbal measures of creative thinking and measures of intelligence. The median coefficient of correlation for the figural measures and intelligence was .06 and for the verbal measures .21. Considering the results of various studies, Guilford concludes that high IQ is not a sufficient condition for high Divergent Production performance, but an above average IQ is an almost necessary condition (Guilford, 1964b).

The second standpoint is supported by Burt (1962, 1964), Mc Nermar (1964), Wodtke (1964), Marsh (1964) and others. They attribute creative production mainly to the operation of general ability rather than a distinct skill labelled as creativity and suggested that conventional
intelligence tests can be used effectively for measuring creativity by adding some divergent thinking sub-tests to them. This contention is supported by the findings of the studies of Phatak (1961), Thorndike (1963a), Marsh (1964), Moss (1966), Hasan and Butcher (1966), Lovell and Shields (1967), Olton et al. (1969), Ginsberg and Whittmore (1968) etc.

Guilford (1967a) reports that these two dimensions have curvilinear relationship to each other, leading to a triangular scatterplot indicating that high creative rarely have low IQ while high IQ is often associated with low creativity. The presence of curvilinear relationship suggested the possibility of a third dimension of the issue under discussion. It suggested the possibility on a threshold beyond which any relationship between creativity and intelligence may not exist (Mc Clelland, 1958; Passi, 1972). It is postulated that minimum level of intellectual ability is necessary for creativity but creativity and intelligence become independent when that critical level is exceeded (Mc Kinnon, 1962; Taylor, 1964; Vernon, 1964, Barron, 1969).
The possibility of a substantial relationship between creativity and intelligence at the lower level of intelligence is pointed out by Anderson (1960). Taylor and Holland (1962) after reviewing a large number of correlational studies concluded that the greater number of investigations report a positive but low correlation between creativity and intelligence, ranging between .20 to .40 for general population and almost no relationship at the higher ability levels. Anderson (1960) also believed that beyond a certain critical level of IQ, creativity functions independently. This threshold point has been reported above 95th percentile by Meer and Stein (1955) and IQ of 120 by Barron (1961), Torrance (1962a) and Yamamoto (1964d).

However, Cicirelli (1965) and Bennet (1973) found a weak support to his hypothesis. Similar fundings have been reported by others also. Haddon and Hytton, 1968; Lytton and Cotton, 1969; Gakhar and Kaura, 1977). Even though several investigations persistently indicated positive but low correlation between creativity and intelligence, such equivocal findings question the validity of the threshold hypothesis and suggest extended research effort to answer the question whether creativity and intelligence are distinctly independent of each other.
2. CREATIVITY AND SCHOLASTIC ACHIEVEMENT:

Another important correlate of creativity is scholastic achievement.

The controversy was provoked and sharpened after the startling finding of Getzels-Jackson Study (1959, 1962) that high creative and high intelligent students, despite the difference of 23 points in mean IQ, did not differ in measure of scholastic achievement. It instigated many investigators to probe into the relationship between creativity and school achievement but the findings contradict one another.

Torrance replicated this study several times, avoiding inadequacies of Getzels-Jackson study and with more representative samples. Torrance did not find any significant difference in the academic achievement of highly creative and highly intelligent students. (Torrance, 1960)

Similar findings were obtained in several investigations (Yamamoto 1964 b.c., Cropley, 1967b). Yamamoto obtained 'clear-out' result when he compared school performance
of high school children with their creativity (Yamamoto, 1964b). Despite the difference of 20 points in IQ, his divergent thinking group and the high IQ group performed equally well on IOWA tests of Educational Development. This was true for the whole sample as well as for boys and girls separately. In his extended effort to analyse this relationship, Yamamoto further compared high creative group with low creative group allowing for the difference in IQ (Yamamoto, 1964c). He found that highly creative students surpassed low creative children. The observation made was that the differences in school achievement were not due to the differences in IQ, but due to the differences in creativity. Yamamoto concluded from this evidence that there is a distinct relationship between creative ability and success in school learning.

Cropley (1976b) also investigated the extent to which creativity scores are related to scholastic achievement. He divided his sample of 320 children into four groups:

1. High-High group—comprised of the children in top half on both creativity and IQ measures.
2. Low-Low group—comprised of the children in low half on both measures.
3. High-Low group—children high on IQ but not on creativity.

4. Low-High group—those who were low on IQ but high on creativity.

It was expected that the High-High group would achieve significantly better than the High-Low group and similarly Low-High Group would surpass Low-Low group, despite the absence of IQ difference. Both of these expectations were borne out. The mean achievement scores were found in descending order i.e., for High-High group 69.6% High-Lows 63.5%. Low-Highs 56.6% and Low-Lows 51.9%. These findings indicate the possibility of discriminating the high and low achievers on the basis of creativity scores even after the IQ differences have been removed.

Passi (1972) also obtained similar results when he divided his sample on the lines of Cropley study, although the relationship between creativity and achievement was found low (r = .385). The double-talented, single - talented and non - talented groups were found to have significantly different mean achievement scores—differences in favour of talented groups.
All these dichotomised comparisons come to the same conclusion that creativity and achievement are closely related.

Flescher (1967) failed to obtain the supportive evidence to the hypothesis that creative potential is a determinant of academic achievement.

Thurstone (1953) had given variety of reasons why creativity and achievement may not be related. On the contrary, he hinted at the possibility of detrimental effect of creativity on scholastic achievement. Some of the Indian studies also failed to find significant relationship between creativity and achievement (Phatak, 1955; Sivewania, 1969; Parmesh, 1973; Sandhu, 1979)

The correlational studies also indicate that there is significant relationship between creative thinking and classroom achievement.

Cropley in his study described earlier (1976b) found coefficients of correlation between six divergent thinking tests and academic achievement, ranging from .163 to .420. Torrance (1959), with the sample of 75 children
from grade 4 to 6, obtained higher coefficients of correlation (ranging from .37 to .53). Even after the effect of IQ was removed the partial correlations were as large as .23 to .49. In another study (1962a, p.63) Torrance again found the partial correlation of .48 between creativity and reading skill and .28 between creativity and arithmetic skill.

Similar relationship was observed by Bish (1964), Cicirelli (1964, 1965) and Feldhusen et al. also (1965). Bish (1964) found positive and significant coefficients of correlation (p .001) ranging from .136 to .420 between the verbal measures of TTCT and California Achievement test scores in a study involving 210 students from fourth or sixth grades.

Cicirelli (1964, 1965) combined the fluency, flexibility and originality measures and correlated the combined score with the criterion measures of achievement viz. Gates Reading Test, California Arithmetic Test and California Language Test. The combined score correlated
with them, .32, .26 and .26 respectively and verbal elaboration score correlated .37, .25 and .31. Cicirelli found significant relationship between figural creativity and achievement measures also.

Thus, it can be seen that although results of various studies overwhelmingly support the thesis that creativity is positively related with scholastic achievement, some contrary findings are also observed.

It seems then that creativity and achievement in school subjects are lowly but positively related. It is quite consistent with what we know about the relationship between creativity and intelligence (which also are lowly positively related) and about the high relationship between intelligence and scholastic achievement. In terms of IQ, the point around which creativity independently helps enhancing scholastic achievement seems to be beyond 120. And finally the experimental studies clearly indicate that creative teaching invariably betters the scholastic performance along with enhanced creativity.
3. CREATIVITY AND SEX DIFFERENCES:

There are three contradictory trends observable in these findings:

1. Males are superior to females in creative thinking,
2. Females are superior to males in creative thinking, and
3. There is no sex difference in creative ability.

The first viewpoint may find its origin in the findings of some surveys which indicated very low contribution of women towards creative acts as compared to men. (Cattel, 1903; Ellis, 1904; Castle, 1913). Cattel (1903) listed only 32 women out of 1000 prominent persons. Similarly, Ellis (1904) could locate just 55 genius-women among 1030 persons in his study of British Genius, and Castle (1913) identified only 868 outstanding women down through the ages.
There are several researches reporting superiority of male in creative thinking. Kelly (1965) and Middents (1968) observed males scoring higher than females on non-verbal creativity measures in their samples of school and college students respectively. Mar'I also found male superiority in creativity over females in the study of Arab and American eight graders. In this study boys performed better on none out of 13 scores derived on Torrance Tests of Creative thinking. (Mar'I, 1971). Similar results are found by Hutchinosn (1967) also. Straus and Straus (1968) reported that boys performed better than girls on measures of creativity in both Indian and American culture, while sex differences were more prominent in India. This finding is supported by other Indian studies also (Raina, 1968, 1969; Prakash, 1966; Gagneja, 1972). Raina and Prakash both, with independent data collected from different parts of the country and about five years apart, found that boys excelled girls on practically all of the verbal creativity tests. It also was found that children in India perform disproportionately better on verbal than on figural tests of creativity (Raina, 1968a).

The second trend of observation that girls are better in creative thinking than boys is also supported by findings of quite a good number of investigations where children from first through sixth grade were in-
After reviewing a large number of studies, Maccoby and Jacklin (1974) concluded that no sex differences are found on verbal tests of creativity in pre-school and earliest school years, but from about age of seven, girls show an advantage in a majority of students. On non-verbal measures, no clear trend towards superiority of either sex can be discerned.

This observation is substantiated by a number of studies. (Olton et al., 1969; Goyal 1973; Panucci, 1978).

Several investigations, involving samples ranging from elementary school children through high school to college students, have indicated that there are no sex differences in creativity (Phatak, 1962; Pogue, 1964; Jackson, 1968; Simpkins and Eisenman, 1968; Burns, 1969; Cheek, 1970, Kaltsounis, 1971; Philips and Torrance, 1971; Kloss 1972).
From this brief overview of research findings on sex differences in creativity, one gets the impression that the results are controversial, inconsistent and inconclusive.

4. CREATIVITY AND CHRONOLOGICAL AGE:

Logon (1957) attempted to establish age-level characteristics of children for the development of imagination from birth to age sixteen, as a part of the Union college Character Research Project. He has given a detailed account of the development of imagination in children. His description is supported by later investigations.

Victor Lowenfeld describes the stages of creative growth of the child as follows:

1. Scribbling stage 2-4 years
2. Pre-Schematic stage 4-7 years
3. Schematic stage 7-9 years
4. Stage of Dawning realism  9-11 years
5. Pseudo Naturalistic stage  11-13 years
6. Crisis of Adolescence stage 13-17 years

These stages are characterized differently and provide an outline of the progression of creative expression 
(Low-enfeld and Brittain, 1966, p. 395 - 402)

The development of any mental function is usually determined by measuring status of subjects in various age groups on the mental ability concerned. Torrance has adopted the same approach in the Minesota studies of creative development of children (1961b, 1962a, 1964)

Torrance observed steady growth from grade one through three, a sharp decline at about fourth grade followed by some recovery during fifth and sixth grades, a small decrement at grade seven and then a steady growth till the end of high school stage. The third grade status was not exceeded till the ninth grade by girls and tenth grade by boys. After tenth grade, the locus of slumps, if any, was not clear.

The slumps in the development seem to occur at the transitory periods from one stage of inter-personal development to another. The theory of Sullican (1953) explains
this phenomenon. Torrance quotes Sullican, maintaining that the skills being acquired during the transition period which usually occurs between the third and fourth grades for most children include: social subordination and accommodation, ostracism, segregation into groups, disparagement, stereotyping, competition, and compromise. He maintains that by this time pressures toward socialization have almost invariably resulted in a careful sorting out of that which is agreed to by authorities. Strong dependence upon consensual validation develops, and unusual ideas are laughed at, ridiculed, and condemned. The child sees those around him not so much as enemies but as sources of humiliation, anxiety, and punishment with respect to that which they communicate, and this tends to reduce the freedom and enthusiasm of communication, especially of original ideas. As the transition is made into early adolescence at about the seventh grade, still other social pressures to conformity appear. These new demands typically produce feelings of inadequacy and insecurity, as new roles are imposed. The resultant anxiety restricts awareness and produces uncertainty, making productive thinking difficult. (Sullivan, 1953 quoted in Torrance, 1962a p.94-95)
Trembly studied the growth of creativity in the children of fifteen years of age and older. He tested thousands of individuals on Consequences test and found the trend of scores in relation to age as: rapid rise from the age of fifteen, reaching the maximum at the age of thirty for men and twenty-eight for women. This finding agrees with the results obtained in other studies related to the most productive age of outstanding creativity (Trembly, 1964).

The most impressive information about the peak period of productiveness has been provided by Lehman through his studies of biographies of eminent people (Lehman and Heidler, 1949; Lehman, 1953). Lehman found that highest quality production comes most often in early thirties. The optimal years for Chemists seem to be 26 - 30 years, for Mathematicians 30 - 40 years, for Musicians 30 - 40 years and for Philosophers between 35 and 39 years of age. For writers, specialised in specific field of literature, this peak period ranged between 27 and 45 years (Lehman and Heider, 1949). Lehman has given some examples of the inventors also, e.g., Aristotle, Francis, Bacon, William Crook, Leonhard
Euler etc., who produced outstanding innovations when they were teenagers.

In one of the earlier studies, Rossman (1935) studied 710 inventors and found that 61 per cent of them made their first invention before the age of 25, the average age being 21.3 years. He also concluded that the most productive years for inventors are between 25 and 29.

Chown (1961) tested his subjects of different ages on five different tests of flexibility and developed five age curves. The curves were strikingly similar, rising slowly in the interval 20 - 40, remaining level from 40 - 45 and declining thereafter. Bilash and Zubek (1960) also found the mean Word fluency test scores keeping at a high level at the age of 45 and then decline rapidly, Schaie's findings are also on the similar lines (Schaie, 1958).

Dennis (1956) studied 100 eminent scientists of nineteenth century who lived till 70 or 80 years of age and found that they were more productive in their eighties than in twenties.
Various reasons have been given to explain the decrease in quality of the creative product at the later age. Lack of recognition, destructive criticism, undervaluing the later output, physical decline, letdown in motivation following high achievement, increase in family responsibilities and administrative engrossment, follow up of the implications of the outstanding production etc. are some of them.
Intelligent tests measure only convergent thinking abilities, memory and practice, and completely ignore the divergent thinking abilities (Guil, 1950; Thurstone, 1952; Cropley, 1967).

Torrance discovered a generalisation that if one identifies as excellent or gifted those who rank in the upper 20 percent of a test of intelligence on Scholastic aptitude are misses 70 percent of those who rank in the upper 20 percent on a test of creative thinking.

The reason for failure to differentiate empirically between the measures of creativity and intelligence may be attributed to the practice of correlating IQ with composite creativity score which may be misleading since effect of age is removed in the first but not in the latter; or to the inappropriateness of intelligence testing model for the assessment of creativity since these two are factorially structured differently.
CLASSROOM CLIMATE:

The concept of climate is relatively new. It is a concept which describes the role of participants interaction within the sociological and psychological framework of an institution. Any new observer coming in to a group for the first time, is able to sense a feeling about the group which is classed an 'atmosphere' or a 'climate'. Hence, the term climate refers to the general feeling - tone of persons in a group towards each other and some of the attitudes they reveal in their behaviour.

Classroom climate may be said to be a compound and not a mixture, where various elements meet, which cannot be separated. Classroom climate may be pictured as a personality sketch of a classroom. Just as personality describes an individual, so the climate defines the essence of a classroom. It is said that there are 3000 to 5000 traits of personality. So too there are several components which create climate in a class. Climate being the result of interaction between diverse personalities, is a much more complex phenomenon.
The Editor Carter V. Good in 'Dictionary of Education' says that:

The learning environment in a classroom includes not only physical environment but also emotional tone. All environmental conditions or qualities that tend to produce a given type of feeling or emotional response, especially the teacher-pupil and pupil-pupil relationships as environmental influences during the teaching-learning process.

M. Mishra (1971) gives the definition of Classroom Climate as:

'The term which refers to generalized attitudes towards the teacher and the class that the pupils share in common despite individual differences. The development of those attitudes is an outgrowth of classroom social interaction. As a result of participating in classroom activities pupils soon develop common attitudes about how they like their class, the kind of person the teacher is, and how he will act in certain situations. These common attitudes colour all aspects of classroom behaviour, creating a social behaviour pattern or climate that appear to be fairly stable once established. Thus, "Climate" is as merely an abbreviated reference to those qualified that consistently predominate in most teacher-pupil contacts and contacts among the pupil in the presence or absence of the teacher.'

According to Flanders (1970)

'The phrase 'Classroom Climate' refers to the generalized attitudes towards the teacher and the class that the pupils share in common despite individual differences. These attitudes emerge out of and thus owe their origin to, the classroom
social interaction. Through participation in classroom activities, pupils soon develop some common expectations regarding the teacher behaviour and their collective attitude towards their own class. These expectations influence the social atmosphere or climate that appears to be distinctly existent and fairly stable, once established. In this way, the phrase 'classroom-climate' is merely a short hand reference to those qualified that consistently predominate in most teacher-pupil contacts and in contacts among the pupils in the presence or absence of the teacher.

To Herbert Thelen (1974)

'Each classroom has its distinctive culture and way of life'. This way of life' cannot be directly observed. The obvious 'other thing' is 'what goes on 'in the classrooms and the obvious people from whom to get observations are the ones who make these things happen to the students and teachers. When a group of people assemble together for an hour or more a day in the same place and for the same general, purposes, they will come to know what to expect from other, what sort of behaviour will be respected, what sort of pronouncements will be respected, what sort of pronouncements will be taken as authoritative. In short, the group develops its 'way of dimensions of the way of life in the family, business or club. But each of these groups has its unique composition and environment.

COMPONENTS OF CLASSROOM CLIMATE:

The classroom climate consists of three components namely, 1. Authenticity, ii. Legitimacy and iii. Productivity.
1. AUTHENTICITY: An activity has authenticity for a child if: (1) he finds it worthwhile or meaningful (2) he can participate in it intelligently and with understanding, (iii) it enables him to relate his past experiences with the present ones, (4) it makes the child feel alive, challenged and completely involved, (5) senses the activity as exciting and dramatic.

In activities that are authentic, the child feels that he fully functions, that he has thoughts, feelings, moods, and fantasies. If he is so disposed, that he can examine his experience to find out about himself, others, the nature of ideas and of the world. He admits others as partners and enrichers and not as threats or constrictors. He feels free to make his own decisions and to accept the consequences there of. Theoretically, the acid test of authenticity would be the penetration of experience to the 'inner core', to the 'deepest' levels meaning' but in practice classrooms are seldom intended to penetrate to these 'deep' levels.

An activity is not authentic for the child if: (1) he feels that it is artificial, (2) he finds that
the actual purposes are sensed to be different from the purpose it really serves, (3) he does not know what to make of it, (4) his past experience of living can have no bearing on the present situation.

On the other hand, an authentic activity is not necessarily comfortable, easy or familiar.

ii) LEGITIMACY: Legitimate activities are:
(1) essential and useful for children because through them the children get the training to solve problems,
(2) Purposeful and concerned with the academic subjects taught in the class, (3) necessary for the future career of children and provide them models for the equipment of future.

Legitimate activities animate the process of socialization which is one of the main aims of education.

iii) PRODUCTIVITY: An activity is productive if:
(1) it is effective for some purpose or if the given purpose are served by these activities, (2) it makes the child conscious of its goals and it learns how to achieve them, (3) it leads the child to self-guidance and self-
learning, (4) it unfolds and develops the potentiality of the child.

All classrooms have some component of productivity. Though some components of authenticity are muted in order to maintain productivity and some legitimating authorities may be suspended in order to enhance authenticity, it is productivity that justifies the existence and functioning of any classroom as a group.

Productivity can be regarded as a characteristic of individual students and/or of a classroom as a group. A classroom is a 'productive group' when it is project or action-oriented. Its efforts would be directed to making things, changing environmental conditions and solving problems. It would act purposively and would consciously obtain feedback, assess the situation and make decisions about how to organise its next effort. It would not only produce, it would learn or develop a methodology of production.

Every classroom has components of ALP constructs. The diagram explaining the components of classroom climate is given on the next page.
AUTHENTICITY

1. Role Co-ordination
2. Openness
3. Involvement
4. Expectation
5. Cognitive Input
6. Affect arousal
7. Stimulation
8. Unselfconscious absorption

LEGITIMACY

1. Imposed discipline
2. Utility
3. Homogeneity
4. Commitments
5. Democratic behaviour
6. Group strength
7. Directedness
8. Identification

PRODUCTIVITY

1. Inter personal support
2. Role satisfaction
3. Resource utilization
4. Role manifestation
5. Behaviour consonance
6. Help
7. Physical facilities
8. Fulfilment
The paramount importance of classroom climate cannot be lost sight of as the classroom happens to be pivotal to innumerable activities or phenomenon which are essential to nurturance of cognitive abilities.

Moreover the teacher plays his role as an educator, leader, and counselor in the classroom. He is the master of all the ceremonies in the class. It is the sole responsibility of the teacher to create a learning atmosphere or climate in the classroom.

KARL GARRISON, KINGSTON and ARTHUR.S. MCDONALD observe that the role of teacher is a vital one as it is the task of teacher to foster creative ability and problem solving behaviour.

According to them, "Creative ability and problem solving behaviour appear early in the child's development. Creative behaviour is characterized by free expression. Some characteristics listed for creative expression are:
(i) prolonged attention around some absorbing experience.
(ii) heightened motivation related to the experience.
(iii) expression, involving problem solving behaviour.

certain conditions have been found helpful in the development of creative expression while some of the methods used in the schools present hazards or obstacles to the development of creativity opportunity for experimentation; freedom of choice, heightened motivation, and guidance in the form of encouragement and a minimum of suggestions are helpful in the stimulation and growth of creative abilities.

Thinking and problem solving abilities do not develop in a vacuum. Children need guidance in the development of problem solving ability. Many opportunities for problem solving behaviour appear in the classroom. The problem solving process seems to involve four essential functions:

(1) An orientation function
(2) Information gathering function
(iii) an hypothesis formation function and
(iv) an hypothesis testing function.

Besides this there are other factors which should be considered for developing problem solving ability. Some of the barriers to the development of problem solving are to be surmounted. Lack of motivation is a significant barrier to the development of problem solving ability. A second barrier that may impede critical thinking is the learners' attitudes. Such attitudes may stem from deep-seated prejudices or from reliance upon authority for the answer to all questions. A third barrier is the relatively systematic method of attacking problems while a fourth barrier is rigidity of thinking. Lack of confidence is given as a fifth barrier.

Guidance of the learner in the problem solving process should be directed towards helping the individual overcome these barriers. The how in learning becomes very important in the development of problem solving ability.

One basic personal need is for adequate self-realization and transcendence of self to others in a social environment. Every classroom has an intangible atmosphere.
or climate which affects learning in a positive or negative way along a continuous of influence. This classroom atmosphere is fostered by the teacher—by what he is in the totality of his own personality, by his relationship to the particular class being taught, by the aids, methods, and teaching approaches he uses, and by his reaction to the physical features of the room. Since the learning climate is largely created by the teacher, it ought to be consciously designed to facilitate personal development towards maturity and integration.

A major force in this learning climate consists of that emotional rapport or understanding and insightful acceptance that a teacher shares with each learner because of his native human dignity.

BERNHARDT (1962) remarks:

That intangible but very real characteristics of the classroom sometimes called "atmosphere" becomes a very important consideration. This in turn places a very heavy responsibility on the teacher for it means in effect, that the easy technique of threat and brivety are not only inadequate but detrimental. In a classroom dedicated to
the above goal the teacher loses his role as a domi-
nating, directing, and restricting authority and be­
comes a true leader and guide who creates a permissive
atomosphere conducive to active participation by all
children in meaningful experience.

Wise and intelligent behaviour requires choice
and self direction. This is possible only when the
child is capable of anticipating the possible consequ­
cences of his activity. This is the product of experience
in which the child has freedom to explore for himself.

There is a very important difference in atmosphere
between the group that develops its own rules and the one
in which the rules are determined by one autocratic who
imposes them on the group.

"The basic qualification of a good teacher is the
possession of a happy, healthy, mature personality."

From the view point of the learner, the atmosphere
involves interaction with all he is as an individual and
with all he hopes to be.
SHOSTRAM and BRAMMEN have shown that this interaction comprises the forces of the "I am" (his nature) the "I can" (his capacities), the "I should not" (his values), and the "I want to be" (his aspirations).

The realization of these forces cannot be obtained in a lecture or indirect response to a verbalized wish. They must be experienced.

The learning climate of the classroom involves more than just the teacher — important though he is.

A study made by ASTIN and HOLLAND (1964) indicates that the character of a social environment is depend upon the typical characteristics of its members. It then, one should know the character of a people in a group and the climate is created by the group.

According to ASTIN and HOLLAND (1964) an atmosphere conducive to true learning will be an emotionally secure environment. Some of the factors contributing to this type of climate may be listed as follows:
1. A relationship of understanding, co-operation, and participation between the teacher and individual students, between the teacher and the class as a group, and among the individual pupils.

2. Limits in the form of rules, regulations, standards, purposes and actions, deferred, understood, and mutually accepted in the light of fairness and effectiveness of class activity.

3. Genuine acceptance of pupils as individuals with personal worth, involving rapport, recognition of individual differences, weaknesses and strengths, impartiality and respect in instances of correcting lapses.

4. Provision for constructive emotional release of negative personality forces and for expression of positive and pleasant emotions.

5. Provision for instances of success, of challenge and also of possible failure. (but with safeguards against frustration, useless conflict, or damaging anxiety).

6. Opportunities for development of skills and approaches to give confidence in new situations and in new learning.
participation enlarged their freedom of expression and resulted in greater learning.

MAJOR OBSERVATIONS:

All these studies on achievement motivation development show definite results. Achievement motivation was developed by various techniques. The input models helped the investigator to develop achievement motivation. As a result of the achievement motivation development, the students gained in many psychic factors such as classroom trust initiative etc., The discussion of such gains is given below:

TEACHER BEHAVIOUR AND INFLUENCE ON PUPIL’S PSYCHIC WORLD:

The integration of cognitive learning with affective learning would be a natural outgrowth of humanistic education. It would require a major change in the role of the teacher who at present mostly tries to shape the students according to the academic goals frequently ignoring the aspects of actualization or growth of the individuals affective domain. The teacher should respect the child as a human being and should assist him in unfolding his dormant potentialities through appropriate activities. At present schools are doing almost nothing to prepare students psychologically either for life in the school or
for life after schooling. There are problems of adjustment, emotional stability and motivation. So the teacher should bring about emotional stability and motivation. So the teacher should bring about desirable changes in the psychological domain of the pupil's personality. This would mean that the teacher's classroom work need be restructured and the behaviour of the teacher in the classroom need be changed.

The following are the research results of the changed teacher behaviour on psychological traits pupils:

**ANXIETY:** Certain amount of anxiety is necessary for any student to achieve. Very low anxiety leads to lack of concern for excellence. Studies reveal that Indian students are high anxiety ridden. Choksi's study showed that English students score on anxiety is 11, American is 12, Nijihavan's score of Indian sample is 19, and Choksi's score is 18. There is a need to give psychological treatment to lower the anxiety score.

Choksi (1975) developed an input programme of psychological education and tried its effect on anxiety level of the pupils. The treatment decreased the test anxiety level of the pupils significantly (Pre mean 10.30; post mean 7.90)
Laxmi (1976) studied the effects of input programme on anxiety of training college students. The students who were given input programme manifested less anxiety (pre mean 15.44; post mean 12.72). They also gained more in n-Achievement than those with high anxiety.

ADJUSTMENT: Pupils adjustment to the classroom procedures and teachers, peers and home help them to learn better. Pupils having low adjustment score generally low. Psychological treatment to pupils contribute to increase their adjustment. Greater adjustment of pupils contribute to their evidence to this.

Jangira (1973) studied the effects of teachers behaviour training of teachers on pupil's adjustment level and found out that due to the experimental treatment the experimental group improved in the score of general adjustment (pre mean 4.34; post mean 4.97).

UDA I PAREEK (1971) studied the effects of teacher indirect influence on pupil's adjustment level. He found out that there was no difference between the adjustment scores of students taught by high I/D and the students taught by low I/D teachers. He also found out that the teachers with high I/D ratios produced better adjusted
students than the teachers with low I/D ratios (adjustment score of pupils of high I/D ration teachers 13.53, low I/D teachers 18.68).

Raijwala, H.B. Desai and Pavanam studied the effects of teacher indirect influence on their pupil's adjustment. They found out that the training and feedback given to the teachers have affected pupils' adjustment towards home, school, peers, teachers and the total adjustment (Raijwala - Pre mean 2.660, Post mean 3.605, H.B. Desai Pre mean 1.885, Post mean 3.495; Pavanam Pre mean 18.1 Post mean 21.93)

CLASSROOM TRUST:

Do the pupils develop trust in classroom procedures. The pupils in India have generally low trust in classroom procedures. Indirect teachers' behaviour and psychological treatments generate greater classroom trust. The following studies reveal similar findings.

Udai Pareek (1971) studied the effects of the teacher of high I/D ratios and low I/D ratios on their pupils classroom trust. He found out that the difference (high I/D ration teacher's mean 21.91, low I/D ration teachers' mean 21.89) is negligible and attributable to chance.
Choksi (1976) studied the classroom trust of the pupils after administering a psychological input programme in primary school in Baroda. She found out a significant difference (pre mean 21.65, post mean 23.50) after giving the programme in pupils and they began to trust their teachers more.

Jungira (1972), Raijiwala (1975), H.B. Desai (1976) and Pavanam (1975) found out that the teachers indirect influence brought about by teacher behaviour training resulted in higher classroom trust level (Jungira pre-mean 17.68, post mean 25.69; Raijiwala - Pre mean 22.415, Post mean 25.900; H.B. Desai - Pre mean 22.415, Post mean 25.900. Pavanam Pre mean 21.0, post mean 26.1).

**PUPILS' INITIATIVE:** Classroom procedures are such that pupils lose their initiative. If pupils' initiative is more than they can learn by themselves. They can manifest so many activities which lead them to greater learning. The following studies reveal the findings:

Choksi (1976) studied the effects of psychological input curriculum on pupils' initiative level and found out that there was a difference in their initiative level positively (pre mean 8.30, post mean 11.95).
Rajiwala (1976), H.B. Desai (1975), and Pavanasam (1976) studied the effects of the training of teachers in indirect behaviour on pupils' initiative level and all of them found out that the training have affected the Initiative of the students positively (Rajiwala - Pre mean 11.310, post mean 14.560; H.B. Desai - Pre mean 11.310 Post mean 14.560; Pavanasam - Pre mean 4.5 Post mean 7.3).

DEPENDENCY:

Should the students depend upon their teachers all the time? or should they become independent? Independence leads to better study habits. The final aim of education is to make them independent in their studies. Still however, as the pupils are in secondary school stage, they remain dependent to a certain extent. Can Independence be increased? Can dependency be decreased? The following researches provide the answer.

Jangira (1972) found out that the pupils independency level increased and dependency lowered by the indirect influence of the teachers who were trained in teacher behaviour. The experimental group scored higher on independency (pre mean 4.68, post mean 12.56) and lower on dependency.
Pavanasam (1976) studied the effects of indirect teacher influence on pupils dependency and found out that the dependency level increased significantly as a result of the teachers modified behaviour (pre mean 11.3, post mean 12.7). He also found out that there was a significant decreased in the independence level (pre mean 5.9, post mean 4.8).

FEAR OF FAILURE: Indian students have a high fear of failure. Achievement motive consists of hope of success (HOS) and fear of failure (FOF). The fear of it is high can be decreased. If FOF is decreased, it will contribute to greater learning of pupils.

Rekha (1974) gave fear of failure treatment to pupils and studied the effect of the raise in fear of failure on academic performance, self image and mental conditioning. As a result of the study she found out that the fear of failure treatment decreased the total n-achievement (pre mean 5.684, post mean 2.447). Their test anxiety level increased significantly (Pre mean 9.289, post mean 14.658) but their classroom trust level and adjustment levels increased.
ACHIEVEMENT MOTIVE: Higher achievement motive leads the pupils towards better learning. The pupils achievement motive in India is generally low. The average score is 40.

Choksi (1975) studied the effects of psychological input programme on achievement motive. As a result of the in-rut programme there was a positive increase in n-achievement (Pre test mean 1.23; post test mean 10.68).

Laxmi (1976) developed achievement motivation among teacher trainees and studied the effect of achievement motivation on the performance of teacher trainees. As a result of the input programme, the n-achievement increased significantly (Pre mean 4.28; post mean 24.56).

SELF CONCEPT: Self concept is a new area. In adult population, if motivation development course is given, it helps the students to develop clearer self concept. Laxmi's study bear an evidence to this.

Laxmi (1976) developed an input programme for teacher trainees and studied its effect on self-perception. The score in the self scale increased significantly (pre mean 15.08, post mean 16.80). The input programme developed
positive attitude towards self, optimism and respect for self. It has also resulted in improving the self confidence and self perception of the teacher trainees. It resulted in an affecting change in the right direction in their attitude towards the perception of self, other people, children, authority, work, reality and parents.

MAJOR OBSERVATIONS:

All these studies lead to one conclusion. The pupil's psychic world can be affected positively and helpfully through indirect teacher behaviour and through motivation development inputs. As a result of this, the pupils gain in academic performance.

To identify the 'Classroom climate' and its impact on teaching learning process many studies were undertaken by Hopkin (1941) Lewin (1948), Bovard and Everett (1951). Further there have been studies like those of Anderson (1939), Lewin, Lippitt and White (1939), Withall (1949) and Flanders (1965) which throw light on the aspects of the influence of constrasting climate in the classroom. Likewise, studies by Flanders (1951), Cantor (1951), Perkins (1950) and others have emphasised the need for a conducive
climate for effective learning and healthy classroom interaction. They recommended a type of indirect classroom behaviour which could generate such a climate.

STUDIES ON SOCIO-EDUCATIONAL CLIMATE IN THE CLASSROOM:

Classroom Climate: It is a widely accepted fact that harmonious living in a human society basically requires a kind of school experience for children which emphasises social values. This has generally been taken to mean that school situation, especially in the classroom, must be modelled along democratic principles. Hence, this general position has important implications for classroom teaching with this idea in mind, Hopkin (1940) developed his theory of democratic interaction. The whole idea is that the classroom situation has been interpreted in different ways by different educationists. The term like 'classroom situation has been interpreted in different ways by different educationists. The term like 'classroom dynamics' 'classroom climate' and 'classroom interpersonal relations' have carried by different educationists for understanding classroom situation. The concept of classroom climate or psychological atmosphere has been used by many researchers besides
Anderson (1939), and Lippit (1943) in the area of psychology and education. Prescott (1938), Lewin (1948) and Rogers (1967) for example, have made considerable use of this concept.

The term 'classroom climate' refers to the generalised attitudes towards the teacher and the class that the pupils share in common, in spite of individual differences. Further, proper attitudes will develop from the classroom social interaction. Pupils develop some common expectations regarding teacher behaviour and also collective attitude towards their own classroom through the participation of classroom activities. These expectations influence the social atmosphere that appears to be markedly distinct and fairly stable, if once established. Thus 'Classroom Climate' refers to those qualities and consistently predominate in most teacher-pupil contacts. Therefore, the study of teacher behaviour through interaction analysis becomes a study of classroom climate as well (Flanders' 1960).

Lewin (1948) in his discussion in his explorations of group life and interpersonal relations, used the concept of group dynamics. The phrase 'Classroom dynamics' is the ornamental term of the concept of classroom interaction.
The classroom interaction analysis is a technique which facilitates capturing qualitative and quantitative dimensions of teacher-student verbal behaviour in the classroom. This technique has its limitation i.e. it does not measure everything that goes on in the classroom. Interaction analysis is concerned with only the verbal communication between the teacher and the students. Ned Flanders (1966) developed this technique out of a social, emotional climate of the classroom communication on student's attitudes and learning. In fact, classroom teaching is a social interaction; The teaching acts produce reciprocal contacts between the teacher and students, and this interchange is called teaching. According to Board and Everett (1951) the social interaction in the classroom will influence the individual student's perception, feelings and interpersonal relations.

(b) INTERPERSONAL RELATIONS: Some earlier researches have revealed that good personal relations in the classroom depend on the ability of the teacher to relate in the same wholesome fashion to students, accepting them emotionally and being capable of understanding their problems and appreciating their aspirations. There are two important dimensions
involved in such relations; one is the degree of report that exists between the teacher and students and the other is, the nature of the relation among the students themselves at least while they are in the classroom. Moreover, it has been revealed that a good climate for learning in the classroom depends on the type of social relations of the students. This means, not only is acceptance of a student by his teacher necessary for his adjustment and learning, but also to a certain extent, acceptance from his peers.

(c) THE CONTRASTING CLIMATE: Prescott and his associates (1938) have made valuable contribution in research on teacher effectiveness and the like recognizing the emotional aspects of the learning process.

Anderson's (1939) classic study in which he assessed the integrative and domineering behaviour of teachers in their contacts with children stimulated further studies in the area of research. Anderson described teachers' classroom behaviour as (i) socially integrative behaviour and (ii) domineering behaviour, 'Socially integrative behaviour' in the terms used to designate behaviour leading to oneness
or commonness of purpose despite individual differences. It is a behaviour of flexibility. It is both, an expression of growth in the person using it, and a stimulus to grow in others.

Some of the more specific indicators of integrative behaviour are occasions of which the teachers: (i) extends invitation (as opposed to use of order or pressure, or command), (ii) helps the child to advance or refine a problem, (iii) offers approval, and (iv) admits own responsibility, ignorance or incapacity (Anderson, 1946).

The term 'dominative behaviour' was chosen to designate behaviour of a person who is inflexible, rigid, deterministic, one who disregards the desired, judgements, purposes, values and welfare of other, who, when himself in conflict has the answers. Examples are the use of force, commands, threats, shame, blame, and attacks against the personal status of another. Domination is the technique of autocracy or dictatorship, which is believed to obstruct the growth processes in others. It is the antithesis of the scientific attitudes and the mind (Anderson, 1939).
He demonstrated that children's behavior was consistent with the kind of personality the teacher displayed in the classroom. His findings is highly pertinent to the hypothesis that the main direction of influence in the classroom is from the teacher to the pupil. He also concluded from his study that reliable patterns of teacher and pupil behavior in the classroom can be obtained through categorization of their overt behavior.

The autocratic - democratic concept presented by Lewin, Lippit and White (1939) was another precursor of Flanders' concept. They report results of an intensive study of the effects of the leader behavior on a group of children. Their research discussed findings on group climate obtained in a setting other than the classroom situation, but the inherent hypotheses are intrinsically the same as those tested by Anderson.

Lippit (1940) in his study organised four clubs of five boys each, and gave each club 'Autocratic and 'democratic' leaders for three consecutive six week periods. Each club was headed by several leaders. Their leadership styles differed with successive groups, keeping specific
criteria in mind. Social interaction between group members and leaders was recorded by observers of each club.

The major conclusions of Lippitt's study were as follows:

* different leadership styles produced different social climates and resulted in different group and individual behaviour.

* Conversation categories differentiated leader behaviour techniques more adequately than social behaviour categories.

* Autocratic leadership elicited either an aggressive, rebelliousness towards the leader or an apathetic submission to the leader.

* Leadership style was the primary factor in producing climatological differences and club personnel were of secondary importance.

Lippitt's work represents one of the pioneering and most significant attempts to observe and control the climate variables in a group situation. His findings provide a sound basis to use categorization of teachers' verbal behaviour as a major technique in such studies.

Starting from the sound proceedings of teacher's verbal behaviour in regular classroom sessions, John
With all (1949) found that the behaviours tended to fall into 25 types, which he could finally reduce to 7 categories. He could also identify more than 1 continuum embedded in the 7 categories. The climate could be (a) problem centered - person centered (b) objectivity - subjectivity and (c) learner centered - teacher centered. His study of the development of a technique for the measurement of social-emotional climate in the classroom proceeds on the hypothesis (a) that it is a group phenomenon, (b) that teacher behavior is the most important single factor in creating climate in the classroom and (c) that teacher's verbal behavior is a representative sample of his/her total behavior.

Bales' interaction process categories was primarily designed to observe and understand group process of problem solving. It includes 12 observational categories which could be combined suitably to study (a) social emotional areas including positive and negative reactions, (b) task areas including questioning and attempted answers and (c) dimensions of orientation, evaluation, control, decision making, tension, management and integration. Apparently a lot of evaluative observation is required on the part of the observer using these categories. Yet the categories are comprehensive and provide valuable data for
judging and analysing group processes.

FIAGS assumes that the verbal behaviour of an individual is an adequate sample of his total behaviour. It includes 10 categories of behaviour showing indirect influence of the teacher, student talk and silence period. Trained observers code the teachers verbal behaviour either through direct observation or through the recordings. The observations are made at the rate of approximately one record per 3 seconds. They are then cast into a 10 x 10 matrix, which highlights the characteristics of the observed teacher. Another line of analysis concentrates on calculating I/D or i/d or T/S ratios bringing out whether the teacher is more indirect or direct in his influence, whether the teacher is more domineering than the student and so on.

This system has two major advantages. First is its compact nature. It is therefore easy to memorize the categories. Secondly, the system is comprehensive and easy to follow. Observers can be trained quite easily in this system and that helps in getting highly reliable data. The FIAGS has also been used widely and many studies in India have been based on the system.
(d) CLASSROOM CLIMATE AND LEARNING:

Teachers are in constant contact with pupils for six hours a day. It is in the classroom that patterns of the thinking should be set, attitudes should be shaped, and participation influences the growth and independence and self direction. Teaching behaviour is the most potent, simple and controllable factor that alters learning opportunities in the classroom (Flanders, 1970).

The meagre information on classroom interaction tends more to support than to deny Canton's opinion. He was rightly concerned about the way teachers use their authority, arbitrarily, that independence is considered to be an evil to be punished and that dependence of others and conformity to outside pressures becomes the accustomed response to a new experience. Canton was the first to suggest a primitive theory about how teachers should alter their behaviour in a predictable sequence during a cycle in teaching. The sequence suggests a definite shift in the role of the teachers.

An analysis of current average classroom interaction reveals a high degree of teacher domination in setting
learning tasks and in thinking through problems so that pupil's ideas and initiative remain under-developed. Consequently, teachers and pupils rarely experience thoughtful, shared inquiry. In classrooms that were above average in positive pupil attitudes and content achievements, the teacher-pupil interaction exhibits a somewhat greater orientation towards pupil ideas and pupil initiation. In spite of these differences in contrasting classrooms, must teachers claim that they want to be attentive to the pupils and their ideas.

Jenkins (1951) pointed out the inter-dependent nature of the pupil-teacher relationship by assessing that scoring will be more effective not only when the pupil's emotional needs are met in the classroom, but also when learners are made aware of their part in helping fulfill some of the teachers emotional needs in the classroom.

Clidewell (1951) found that a denial of felling by the leader was accompanied by a reduction of leader effectiveness whereas the acceptance of fellings increased his effectiveness.
Mckeachy (1951) points out that more learning takes place when there is less anxiety and if constructive learning activities are provided. He further added that there is greater interaction and spontaneity in the group-centered class.

Perkins (1951) revealed that children tend to be conscious of a warm acceptance by the teacher and to express greatest fondness for the democratic teacher. To him, again, the rule of the classroom climate is crucial to the learning process.

Cage and Susi (1951) sought to determine the accuracy of the teachers' perceptions of pupils' dynamic interaction of teachers. They found that pupil favourableness to teachers depended on the accuracy of teachers' social perception of pupils.

Jenson (1955) formulated a rationale for assessing the social structure of the classroom which sums up one aspect of the methods of analysing classroom interaction. Like Thelen (1959), he emphasised the close interdependence
of personal needs and group needs and that unless individual relate effectively to one another in a class, the achievement or social problems cannot be dealt with.

Flanders (1969), in his review of different studies on teacher effectiveness has pointed out the support these research studies give to the indirect influence who makes use of the ideas and opinions of his students.

In various studies, as pointed out earlier, different technology has been used for the same behaviour pattern. They were, for Anderson et al., (1939), 'dominative vs integrative', for Lippit and White (1939), 'authoritarian vs laissez-faire', for Withall (1949), Flanders (1961) and Perkins (1950) 'perclusive vs inclusive'. Later on, Flanders (1965) introduced his nomenclature - 'direct vs indirect' teacher behaviour.

All the studies listed above indicate directly or indirectly that the teacher behaviour in the classroom determines to a great extent how much impact the teacher is going to have on his students and in what direction. These studies also suggest that democratic integrative teachers
produce students with comparatively high achievement and good personality characteristics than teachers showing authoritarian or domineering behaviour.

4. CONCLUSIONS:

In this chapter, an attempt has been made to bring together and review several studies made in India and abroad regarding classrooms, teacher behaviour and other related themes. The review of studies in the teacher classroom behaviour highlight the following:

* Teacher behaviour in the classroom is being studied on an increasing scale by researcher workers in Education.

* Teacher classroom behaviour is instrumental in generating what is known as classroom climate.

* The nature of the classroom climate depends upon whether the teacher behaviour is autocratic or democratic, dominating or integrative, direct or indirect.
Classroom climate is affected by a multitude of variables which includes environmental variables, variables associated with attitudes of teachers and pupils, variables concerned with sociometric status of the classroom group and those which are related to teacher-pupil interaction.

Teacher behaviour results in different patterns of teacher pupil interaction.

Teacher behaviour can be analysed, measured and modified.

Teacher behaviour, classroom interaction and classroom climate influence pupil's growth, achievement and attitudes.

Teachers' indirect behaviour under certain conditions, results in increased learning by pupils.

Teacher behaviour considerably influence pupils' attitudes.
2.4. MOTIVATION:

The forty ninth book, National Society for the study of Education, Chicaso University has advocated strongly success in any undertaking or any single not depends to a large extent on how badly one wants to succeed, and how much energy one puts forth - in short, on how strong one is motivated.

Motivation is a vital condition of all learning. Learning is a function of motive-incentive conditions. Learning takes place when there is: (a) a need, drive or motive, (b) an appropriate goal, the attainment of which will satisfy the motive.

With present-day emphasis on character development through self-direction and regarding the school as primarily a "Laboratory for learning", motivation becomes all the more important. Personality development is an educative process which, in turn is entirely dependent on original and acquired drives, motives and attitudes, together with their accompanying feelings and emotions, satisfying or annoying.
In education, motivation is the art of stimulating interest in the pupil and cultivating the interest already present in behalf of socially approved conduct. Motivation involves arousing, sustaining, and directing desirable conduct.

2.4.1. DEFINITIONS OF MOTIVATION:

According to H.W. Bernard, (1964) motivation refers to all those phenomenon which are involved in the stimulation of action towards particular objectives, where previously there was little or no movement towards these goals.

According to Herb motivation refers to (i) existence of an organized phase sequence,

(ii) its direction and content

(iii) Its persistence in giving direction or stabilizing of content.

Murray, (1960) defines motive as an internal factor that arouses, directs and integrates a person's behaviour.

2.4.2. FACTORS OF MOTIVATION:

Terminology and Language Difficulties. The tendency
is to accept motivation as covering any and every factor of the springs of human action, from beginning to end. However, in the interests of a more concise terminology, it is better to use words that accurately describe the discussion at hand, such as Attitude, set Bias, Readiness, Urge, Drive, Impulse, Appetite, Craving, Incentive, Want, Desire, Wish, Interest, Aim, purpose, Intention, Longing, Will, Determination, and the like. Motivation takes in both subjective and objective factors: the elements of readiness to act on the part of the individual, such as hunger and thirst as distinguished from the elements of the environment which may appeal to the individual, such as a glass of ginger ale or a turkey dinner. These are sometimes contrasted as intrinsic and extrinsic, or as internalized and externalized. Drive, whether of the original bio-physical type, like hunger, or acquired, like a taste for olives or narcotic drugs, furnishes the push, the starter, so to speak. When this push mobilizes the individual or a portion of him toward an objective or goal, a motive exist and will tend to persist until the drive is satisfied (allayed); if thwarted, it will usually seek a new orientation to the environment or obstacle and make a new try. Hence all activity is motivated behaviour.
Insofar then, as any act has a goal, the individual is motivated.

Incentive is the environmental external determinant stimulating a drive, which in turn seeks a goal and gathers momentum towards the realization of that goal. Attitude is the residue of the effect of motivation as it meets the various fates of motives discussed below. Although closely related, attitude differs from concept and trait in being more inclusive. As distinguished from motive, attitude is a more enduring state of readiness or unreadiness (prejudice) to react to a given situation. A notice, being transitory, is concluded the moment the drive is allayed or the original motive replaced by another motive, through regrouping of the forces for another try from a different angle.

Thus, every action of a human being seeking to realize a goal is motivated. And since all learning has a goal, all learning is motivated. It is important to ensure, therefore, that it is properly motivated, and so on, make a difference in the effectiveness of the learning process. It is the task of the teacher to improve the conditions of effective learning: he does this by influencing motivation.
It involves manipulating incentives and goals, creating the proper atmosphere, arousing emotional interest, and inducing a pleasant state of satisfaction in the pupil. The secret of successful teaching is to discover means of making the pupil like and want to do the things that the teacher wants him to do. The accomplished scholar is one who has acquired a taste—more strictly an attitude—through a long series of motives in the field of learning.

Since motives and motivation are learned and subject to manipulation, whether trial-and-error or deliberate, it is the task and privilege of the teacher to manipulate the factors of motivation to the best advantage of all concerned.

The tendency is to accept motivation as covering any and every factor of the springs of human action, from beginning to end.

2.4.3. NATURAL MOTIVATION:

By natural motivation is meant those motives which are
structurally or socially determined and are "natural" in the sense that they are practically universal among human beings. These are the common, elementary drives and motives that are experience constantly every day.

They may be classified into three categories, for the sake of convenience.

1. Motives Due To Elementary Basic Needs and Wants, Structurally Determined. Respiration, heart-beat, flow of blood, secretion of glands, functions of metabolism, growth and maturation, digestive process, anabolism and catabolism, elimination, reflexes and autonomic acts, appetites (hunger, thirst, sex), crying, smiling, random activity, functioning of the sense organs, and the like are "standard equipment" with every normal human being. A teacher can do very little about them except to recognize and appreciate that a human being is built to function in these ways and must be allowed natural outlets for them without undue restraints. As has already been pointed out, however the actual expression of even those elementary drives is subject to social pressure and must be socially motivated. Eating, for example, is
allowed in almost any society, but what is eaten, how it is eaten, and many other considerations are determined by particular folkways and mores. And if these matters can be governed by etiquette which is due to learning, then they can be influenced by learning in the classroom.

2. Motives due to drives containing relatively more social and physical factors. These are: imitation, anticipation, impatience, exhaustion, all emotional reactions, sentiment, satisfaction of drives due to the exercise of special gifts (talent, aptitude), domination, exploitation, acting according to habit, aesthetic appeal, security, achievement, desire to explore (to know, to manipulate), desire for mastery over objects (situations, people), status, happiness. Here is another set of subjective-objective situations that may be relied upon to produce or greatly modify conduct. Manipulating any of the incentive ingredients in these motives can change the motivation of the individual. Just how this may be done in the school situation will be discussed later.

3. Negative drives and motives (those are usually avoided). Negative motives are fully as important as positive drives in determining conduct. Insofar as they direct action
toward a goal (avoiding something), they are really positive motives for all intents and purposes. Nevertheless, it is desirable to enumerate them for the sake of bringing them to our attention. The negative motives may be listed as: pain, all unpleasant sensory reactions, being forced to do things (especially unpleasant tasks or tasks beyond one's ability), fatigue, exhaustion, (loss or threatened loss of status), frustration and feeling of failure and helplessness, being forced to make a choice, loss of freedom of action, general fears, specialized fears (phobias).

2.2.4. ARTIFICIAL MOTIVATION: LEARNED OR ACQUIRED MOTIVES

There are motives not directly related to the basic needs known as acquired motives or new motives. New motives may be acquired in many ways. Some of these ways are: substituted satisfaction; transfer of interest from the end motive to the means motive; acquisition of new sentiments, new tastes, new knowledge, new skill, new points of view, or new ideas and ideals; changes of in the physical and mental states, attitudes, feelings, emotions, or likes and dislikes; and many other factors which may add, detract, deflect, modify or in some way alter the drive or goal, or both. These possibilities give the teacher a remarkable opportunity to effect motivation in the pupil by manipulating the various
environmental factors involved. Even the most elementary primary needs and wants of the child, such as eating and eliminating, must be met in socially approved ways. Hence, new motivation is taking place constantly. The teacher may assist the pupil in reorienting himself toward satisfaction of needs and wants in socially preferable patterns of conduct.

More specifically, the techniques, methods, and environmental factors of special significance for motivation in school learning may be listed as follows: maturation (growth and development), knowledge of results, Law of effect, rewards and punishments, praise and blame (reproof), participation, working for self (rivalry and competition), working for the group (cooperation), relating learning to pupil's needs, learning through experience, informing pupil of his progress, developing interest (readiness) evaluation of achievement, social recognition, proper interpersonal relationships between pupil and teacher and all other inter-group contacts, developing proper attitude and morale, ideals and hero-worship, avoiding frustration, fear and jealousy, the teacher's role as leader (imitation and inspiration), influence of friends and playmates, "interest patterns, " sportsmanship, desire to please parents and
teachers (love of approbation), securing status ("marginal" membership in the group), accepting one's role in society, group standards, "life space" (free movement), enlightened self-interest, and appeals to the total personality.

2.4.5. THEORIES OF MOTIVATION:

1. MASLOW'S NEED HIERARCHY THEORY:

Behaviour is not a simple matter of satisfying one's need. Every one is surrounded by a multiplicity of needs, and the various ways in which these needs are satisfied. Since one cannot attend to all the needs at one and the same time, one has to select such needs which require maximum and immediate attention. At that same time one has to make a compromise between his drives and social values, which often run counter to the basic needs - eg., sexual morality and six drive.

Under the above premise, Maslow (1954) proposed an interesting need hierarchy theory. He classified the needs into 7 categories - physiological needs, safety needs, love or belongingness needs, esteem needs, cognitive needs, (need for knowledge, need for understanding), aesthetic needs and self actualization needs. According to him these needs can be arranged in a hierarchy i.e. nor-

mally an individual does not consider a particular need until those that are more basic are satisfied. For example, a hungry man will be more concerned about food which satisfies the physiological need and would not bother about love or esteem. According to Maslow the organism is dominated and, its behaviour organised only by its unsatisfied needs.

Though certain slight reversals in the hierarchy may occur due to one's past experience, the hierarchy is reasonable. The first 4 are deficiency or maintenance motives (needs) that are granted or denied by external factors. They are strong and recurring and grow stronger when denied. The last 3 are growth motives that spring from within. They are gentle and continuing and grow stronger when fulfilled.

7. Self actualisation needs—displaying the needs of a fully functioning person, becoming the self that one truly is.

6. Aesthetic needs—appreciation for order and balance a sense of beauty.
5. Need for knowledge and understanding knowing how to do things, meaning of things, events and symbols, knowledge of relationships, systems and processes.  

4. Esteem needs—being recognised as a unique/person. 

3. Love or belongingness needs—acceptance as a member of a group, knowing that others are aware of you. 

2. Safety needs—being concerned that tomorrow is assured, having things regular and predictable. 

1. Physiological needs—concern for immediate existence at breath, etc. 

Hierarchy of needs proposed by Maslow (1954) and modified by Root (1970).
i) **Physiological needs:** The most potent of all, but the least significant for an ordinary or superior person are the physiological needs. According to Maslow when they are deprived, all other needs become extinct or recede into the background. However one may find instance where this point of view is contradicted. People who go on hunger strikes are a glaring examples of this phenomenon. Yet, it is certain that when this need is deprived, the organism is motivated to do something. So, a child who is deprived of food until he does some work, is certainly motivated to complete it so that he can satisfy his hunger.

ii) **Safety needs:** When physiological needs are gratified the safety or security needs become dominant. Any organism wants safety or security.

iii) **Love or belongingness needs:** When the first two categories, of needs are fulfilled the need for love and belongingness becomes predominant. This category of needs emphasize the gregarious nature of man. Each individual wants to identify himself with a group, with his family etc.

iv) **Esteem needs:** Self esteem, reputation, status etc. go under this category. A person whose basic needs are
taken for granted, thinks of reputation and prestige in the society. Everyone wants to look high in the eyes of others. This is achieved by having costly clothes, house, car etc. If this need is not satisfied one may develop inferiority feelings of being a misfit in the society, etc. Sufficient satisfaction of higher order needs.

As mentioned earlier, the needs described so far are known as deficiency needs or maintenance motives. They are granted or denied by external factors. They grow stronger when denied.

The needs in the higher rungs of the ladder are known as growth needs. They spring from within, they grow stronger when fulfilled. They are - achievement needs, aesthetic needs and self actualisation needs.

v) Achievement needs: They may be classified as need for knowledge and the need for understanding. Need for knowledge is satisfied when there is access to information, knowing how to do things, meaning of things, events, symbols, etc. The second category - need for understanding implies knowledge of relationships, systems and processes, the integration of knowledge into broad structures, etc.
vi) Aesthetic needs: The next in order are the aesthetic needs (i.e.) appreciation of order and beauty. One whose lower order needs are fully satisfied, or knows that he need not bother about them, derives pleasure in appreciation beauty, nature, etc. Tagore, Words worth etc, are the best examples for this.

vii) Self actualisation needs: Self actualisation means to fulfil one's individual nature in all its aspects. One who is talented in one specific area feels uneasy if that talent is not nurtured and utilized. He wants to attain perfection in that area.

The highest level of functioning occurs when a person is self actualised. The self actualised person is one who is motivated by needs to be 'open and not defensive', to like others and self without giving into aggression, to act in ways that are ethically and normally good for the society, to express autonomy and creativity, to be curious and spontaneous in interchange with the environment. Only the satisfaction of the more basic needs allows the individual to become self actualised.
2. M. CLELLAND'S THEORY OF ACHIEVEMENT NEED:

As opposed to drive reduction theories - (ie) with a more positive orientation to the phenomenon of motivation - stimulation theories have been propounded. The basic premise of these theories is that the organism seeks not equilibrium but disequilibrium. It always strives for an optimal level of stimulation. Glauzer, (1958) in his excellent review of all the literature on this topic suggests that the organism requires a certain amount of stimulation per unit of time. If the stimulation is less, it will seek more; if it is too much it tries to reduce it.

Among the stimulation theories, the most well known are those of (i) Berlyne, based on curiosity, (ii) Montgomery, based on exploration (iii) Hill, based on activity, (iv) Harlow, based on manipulation and (v) White based on competence. In all these theories the common feature is their basic premise that novel stimuli functions as motivational agents. The novel stimuli evoke drives for behaviour. They represent a need for mastering the environment. The young children even in his early years demonstrates the need to explore - he wants to touch every thing, handle all objects etc.
Closely related to the above point of view is the need for achievement proposed by Mc. Cleeland. It may be viewed as a widely generalised level of aspiration. A person with a high need for achievement sees problems and obstacles as challenges to be met and it motivated to tackle them. In certain societies achievement is sine qua non for self respect, whereas in others it is an avenue for self respect. Striving for achievement is a particular characteristic of middle class way of life.

CONCEPT OF ACHIEVEMENT MOTIVATION:

Children with the same intelligence achieve at different levels. What determines the level of aspiration of a student? How does the expectation of success affect the academic achievement of students? What role do incentives play in motivating achievement behaviour? These questions are dealt with in theories of achievement motivation developed by David C. Mc. Cleland (1961) and John W. Atkinson (1965) and their associates.

There are two important directions that the research on achievement motivation has taken. One represented by Atkinson, deals with the scientific task of sharpening the psychological theory of motivation of testing and refining
it, and working it into a more useful conceptual tool. The other has been primarily concerned with the social origins and major social consequences of the need for achievement. The direction of inquiry has been guided by Mclelland's elaboration of a hypothesis that the achievement motive is the main spring of entrepreneurial activity fostering the economic development of society.

In very simple terms, the achievement motive can be defined as the impetus to do well relative to some standard of excellence: a person with a strong need for achievement wants to be successful at some challenging task, not for profit or status, but merely for the sake of doing well. Mclelland (1965) defines the achievement motive as, what is measured by coding an individual's spontaneous thoughts, as in the imaginative stories he tells for the frequency with which he thinks about competing with a standard of excellence, or doing something better than before.

Other studies on achievement motivation have emphasized the subject's level of aspiration and his reaction to success or failure at a task.
3. ATKINSON'S THEORY OF ACHIEVEMENT MOTIVATION:

In a school there are times when the student performs a task specifically to be evaluated upon his performance; examinations are the typical example. There are other times, however, when the student may be performing a task on which he can neither succeed or fail, and evaluation is quite inappropriate (e.g., reading library books, helping plan a special class, etc.). Atkinson's theory of Achievement Motivation applies only when an individual knows that his performance will be evaluated by himself or by others in terms of some standard of excellence and that the consequences of his action will be either a favourable evaluation (success) or an unfavourable evaluation (failure). The disposition to strive for achievement is presumed to be latent until aroused by situational ones which indicate that some performance will be instrumental to achievement. That is, a student with a high need for achievement will not seek success in every situation is such that his behaviour on some task will be evaluated against some standard of excellence will his motive to achieve be activated.

To discuss Atkinson's theory, three variables need to be defined, motive, expectancy, and incentive. (Atkinson, 1965)
An expectancy is a cognitive anticipation usually aroused by cues in a situation, that performance of act will be followed by consequences. A student for example, may have the expectancy that if he studies he will pass an examination. The strength of expectancy can be represented as the subjective probability of the consequence, given the act. That is, the strength of the student's expectancy is the subjective probability that he will pass the test if he studies.

An incentive represents the relative attractiveness of a specific goal that is offered in situation, or the relative unattractiveness of an event that might occur as a consequence of some act. For example, passing an examination offers some attractiveness relative to other uses of the student's time besides studying. In deciding whether or not to study the student has to weigh the relative attractiveness of passing the examination versus playing ball, earning money, and the like. A motive is a disposition to strive for a certain kind of satisfaction in the attainment of a certain class of incentives. Motives are relatively general and stable characteristics of the personality that have their origins in early childhood experience.
The general aim of one class of motives is to maximise satisfaction of some kind; the achievement motive is the disposition to approach success. The aim of another class of motive is to minimise pain—an avoidance motive represents the individual's capacity to experience pain in connection with certain kinds of negative consequences of acts. The motive to avoid failure is considered a disposition to avoid failure and or a capacity for experiencing shame and humiliation as a consequence of failure.

Atkinson's theory states that a student's need for achievement depends on three variables: his motivation to achieve, the expectancy that by doing certain acts he will achieve, and the incentives for engaging in other competing activities.

The actual achievement oriented tendency of an individual however, is conceived by Atkinson as being the resultant of two opposed tendencies: the tendency to achieve success and the tendency to avoid failure.
The tendency to achieve success depends upon the individual's motive to succeed, the strength of his expectancy that success will be the consequence of a particular activity, and the incentive for attempting the activity. The tendency to achieve success is strongest when a task is one of intermediate difficulty and when the person is highly motivated. A number of studies have demonstrated that persons in whom the tendency to achieve success is relatively strong will show greater preference for tasks of intermediate difficulty than that of persons in whom the tendency to achieve success is relatively weak (Atkinson and Feather, 1966).

The theory predicts that when the task is of moderate difficulty students with a relatively high tendency to achieve success will be more successful on the task and will persist at the task longer when faced with the option of engaging in some non-achievement related activities.

Whenever a performance is evaluated in relation to some standard of excellence, what constituted the challenge to achieve for one individual poses the threat of failure for another. The tendency to avoid failure is aroused.
when there is an expectancy that some act will lead to failure, and when there is incentive for avoiding failure. The tendency to avoid failure inhibits the student from attempting a task on which he is to be evaluated, especially when the possibility of success is intermediate. Students however, whether dominated by the tendency to avoid failure or not are forced into achievement-oriented situations. In such a case the student who is dominated by the tendency to avoid failure is likely to choose tasks with a very high or very low chance of success. Doing so minimizes his anxiety about failure for if the chance of success is very high he is almost sure not to fail and when the chance of success is very low no one can blame him for failing at a such difficult task.

3.1 EXPECTANCY OF SUCCESS AS A MOTIVATIONAL VARIABLE

One of the most interesting implications for education of Atkinson's theory of achievement motivation has to do with the effects of success and failure of students on a task. It has been assumed that if a student succeeds at a task and is rewarded he will repeat the task. This is the well known law of effect that has been primarily
established by learning theorists. Atkinson argues that
the law of effect is fundamentally inadequate as a guide
to understanding the effects of success and failure in
the domain of achievement-oriented activity. Success
does not invariably strengthen the tendency to undertake
the same activity on another occasion; it sometimes weakens the subsequent tendency to engage in the same activity.

When an individual undertakes an activity and succeeds
his expectancy of success at that task and similar tasks is
increased. When he fails, his expectancy of success at
the similar tasks is decreased. Atkinson theorizes
that the incentive to engage in a task is directly related
to the expectancy of success, and therefore, a change in
expectancy results in a change in incentive. It can then
be shown mathematically (Atkinson, 1965) that when a student
whose motive to succeed is greater than his motive to avoid
failure has a success experience, instead of seeking to
repeat his success on a similar task in the future, he will
raise his aspiration level and look for a harder more
challenging task. When he has a failure experience, he will
lower his level of aspiration and look for a task that is
easier in the future. When a student whose motive to avoid
failure is stronger than his motive to succeed, the law of effect does hold for when he succeeds at a task; he will repeat the task in the future as his expectation that he will succeed will be higher and he will have less anxiety about failing.

These theoretical predictions are supported by research conducted by Atkinson and his students. In terms of classroom teaching if the teacher knows that a student is dominated by the motive to succeed and he succeeds on an assigned task, to keep the student interested in academic achievement the teacher then should offer him a more challenging assignment. If the teacher knows that a student is dominated by the feat of failure and he succeeds on an assignment, the teacher should then offer him similar assignments or perhaps increase the difficulty of the tasks very gradually to keep him functioning successfully in the classroom.

3.2 PERSISTENCE AFTER CONTINUAL FAILURE:

Another area in which Atkinson's theory generates interesting implications for the classroom is the student's
persistence at a task after continual failure. A person in whom the motive to succeed is dominant should be much more persistent following failure at a task that he believes initially to be easy that one he believes initially to be difficult. A person in whom the motive to avoid failure is dominant will behave quite differently; he will be much more persistent following failure at a task that he believes initially to be very difficult than one he believes initially to be quite easy; When he fails at a task he believes initially to quite easy his anxiety about failure increases and, therefore, he avoids the task in the future. But when he fails at a task he believes initially to be quite difficult his anxiety about failure will actually decrease, as no one can blame him for failing at such a difficult task and therefore his tendency to engage in the task will increase.

A teacher who known Atkinson's theory should be alert for the student who is dominated by the motive to succeed failing at a task that he perceives as too difficult and give him something easier (and, therefore, more challenging) to do. The student who is dominated by fear of failure, however, will have to be persuaded or influenced to give up a task too difficult for his abilities and settle on something easier. When the two fail at a task they thought
would be easy, on the other hand, the teacher may let the former student work on his own as he will be motivated to continue trying to accomplish the task; the latter student will become anxious and wish to drop the task, which the teacher may or may not want to allow, depending upon the circumstances.

3.3 ACHIEVEMENT MOTIVATION AND ACADEMIC PERFORMANCE:

A number of studies have shown that individuals whose achievement motivation is high (and is stronger than those having fear of failure) prefer tasks in which they have intermediate probability of succeeding, persist longer on achievement tasks, and perform at higher levels, when compared with students whose achievement motivation is low, or is outweighed by their fear of failure.

On the basis of Atkinson's findings one would in general expect that students high in achievement motivation would perform well in school. There have been a wide variety of studies on the correlation between achievement motivation and academic performance. These studies have been conducted on college students, and elementary and secondary school
students. For the most part these studies show a low and often non-significant relationship between the two variables. How then can this be explained? These studies are, by and large, examples of educational research, that, while claiming to test a major hypothesis, miss the boat completely in terms of a relevant testing of the theory. The theory of achievement motivation generated by Atkinson does not say that there should be a general relationship between achievement motivation and academic performance. On the contrary, it states that under certain conditions there will be a strong relationship, under other conditions there will be no relationship. Most of the studies finding negative results used large groups of students without attention to whether the conditions that mediate the relationship between the two variables were present or absent. Their negative findings can be interpreted as meaning that in most school situations the appropriate conditions do not exist for achievement motivation to affect academic performance.

A student with a high need for achievement should achieve academically only when his fear of failure is weaker than his need for achievement and when the academic tasks assigned are challenging and represent an intermediate opportunity for success. If the class is too easy or too difficult
he will not be motivated to achieve in it. If his anxiety about failing on the other hand, is too great he will not work on a task unless it is very easy or very difficult. What happens to a student with a high need for achievement when the classroom does not offer him the challenge which motivates him? Very simply he will probably look elsewhere for a task to work on. This might be in extra curricular activities. If students who have a high need for achievement are not challenged in the classroom and they turn to extra curricular activities one would expect a low correlation between the success in the two activities.

Rolland and Richards (1965) report that academic and extra curricular achievements have only negligible correlations with each other.

It should be noted that there are other possible explanations for the lack of correlation between need for achievement and academic performance Mitchell (1961) in a study using eight different measures of Achievement Motivation found that achievement motivation as customarily measured consists of several different dimensions or
components including academic motivation and efficiency, self-satisfaction, wish fulfilment motivation, non-academic achievement orientation, and external pressures to achieve. Thus, many measures of achievement motivation include non-academic components that should not be correlated or expected to correlate with academic performance.

3.4 APATHY AND ACTION:

The theory of achievement motivation and level of aspiration give an interesting prediction about the reasons for apathy in the schools. According to the theory, people are not likely to attempt to achieve even highly valued objectives when they see no way of attaining them.

That is when the expectation of success is zero, the tendency to engage in the behaviour will be zero. If people feel that they cannot achieve their objectives, they will have no motivation to attempt to do so.
Atkinson's theory would predict that when minority group students feel that education will not open up opportunities for them in society, they will have no motivation to achieve in schools. If, however, they do feel that education will make a difference in future opportunities, then they will be motivated to achieve in schools.

Similarly, the theory sheds some light upon why social revolution tends to occur only after there has been a slight improvement in the situation of oppressed groups. The improvement raises their level of aspiration, making goals which were once viewed as unattainable now perceived as realistic possibilities since the goals are new perceived as attainable, people work hard to achieve them in the immediate future. In other words, if minority groups students begin to feel that education is a realistic means to formerly unobtainable goals, they will become highly motivated to achieve academically.

3.5. INCREASING TENDENCY TO ACHIEVE:

From the theory that the tendency to achieve is determined by the motivation to achieve, the expected probability of success, and the incentive for achievement

\[ T \text{S} = M\text{s} \times P\text{s} \times I\text{s} \]
One may conclude that there are two major ways in which to increase motivation in students. One is to increase the need for achievement (or conversely lower the fear of failure). Atkinson feels that the latter is the most feasible means of bringing about changes in a student's tendency to engage in achievement-oriented behaviour, as in his opinion, it is a much easier variable to change than are personality characteristics of need for achievement and fear of failure.

There are many ways to raise the expected probability of success, such as breaking the tasks down into sub units that the students can handle more easily or provide the skill training, help, and consultation the student needs in order to succeed at the task.

Mclelland (1965) has taken just the opposite route; he has developed a training programme by which achievement motivation may be learned and increased.

3.6. OTHER MOTIVES FOR ACADEMIC ACHIEVEMENT:

The theory of need for achievement does not make the claims that the need for achievement is the only reason why
a person achieves. There are other motives for achievement, such as the desire for social approval, the desire to conform to role expectations, the desire for reinforcements offered for achievement and the desire to conform to informal and formal norms in an organization. When attempting to increase the achievement of a student, it is important for the teacher to top other motives and external pressure for achievement as well as the need for achievement.

3.7. MCCLELLAND'S THEORY OF ACHIEVEMENT MOTIVATION:

David C. McClelland and his associates have taken a quite different approach to achievement motivation than has the Atkinson groups. McClelland has been interested in the development of achievement motivation in individuals and the consequences for a society of having a large number of achievement oriented numbers. In what follows, the work of McClelland on the behaviour of individuals with high achievement needs, the child rearing practices that affect
one's need for achievement, the effect of achievement oriented individuals on the development of society, and the development of high need for achievement in adults, teenagers, and children have been described.

3.8 BEHAVIOUR OF STUDENTS WITH HIGH - ACHIEVEMENT NEEDS:

There are a number of studies on the difference in behaviour of individuals, with high achievement needs and in those with low achievement needs. In comparison with individuals who score low on achievement - motivation measures, individuals with a high - achievement - needs show a greater preference for moderately difficult tasks, then enjoy taking carefully calculated tasks (that is moderate risks in which skill or ability - nor chance - is evolved. They are more self confident than are persons with low achievement-needs. They have confidence in themselves and their abilities, not in luck or fate. They do not become motivated to do well unless the task is challenging to them. They are very much interested in concrete measures of how well they are doing in performing a task. They are
not motivated by money per se, but will seek money when it is used as a symbol of attainment, a measure of success. They have the ability to defer gratifications. Finally they will seek out occupations in which they have a moderate chance of succeeding rather than those in which they have complete certainty or little possibility of success.

3.9 THE DEVELOPMENT OF ACHIEVEMENT MOTIVATION CHILD READING

One of the most crucial studies on achievement motivation for the later development of the theory was Marian Winter Botton's (1953) study of childhood origins of achievement motivation. The obtained achievement motivation scores from twenty nine boys, aged eight to ten. In addition, she interviewed the boy's mothers, asking questions about how children ought to be raised. The most significant part of the interview was questionnaire concerning demands for independent actions. Each mother was asked to tell by what age she expressed her child to be able to do such things as (1) know his way around the city (2) try new things for himself (3) do well in competition, and (4) make his own friends.
Winter Bottom found that the mothers of the children with high needs for achievement expected the accomplishment of the above four tasks at a markedly earlier age than did the mothers of low-scoring boys (in terms of achievement motivation.) It seems that mothers of children with high achievement motivation are concerned that a boy should begin early to move out on his own, to acquire skills, and explore possibilities. Though such attitudes it is inferred that the mothers gave the boys early independence training. In contrast the mothers of the boys scoring low in achievement motivation believed in more restrictions on behaviour and kept those restrictions on until a later age.

Rosen and D'Andrade (1959) studies about the reaction of a few parents when their sons were trying to achieve on prescribed tasks. They visited forty families of which twenty included sons with a high score on need for achievement and twenty sons with a low score. The boys were between the ages of nine and eleven and were matched for age, race and IQ.

Parents of high achievement oriented boys, especially, the mothers, worked up a lot of hopeful encouraging tension over the performance and when it went well poured out
happiness and warmth. When he performed poorly the mother tended to react with disapproval.

The mother stressed achievement training and were frequently dominating rather than allowing their son's self-reliance. The mothers were themselves striving, competent persons and apparently expected their sons to be the same. They became very much involved in their sons work, giving them constant emotional feedback of warmth and rejection. For the low-achievement oriented boys, like fathers tended to give specific directions, and to make decisions for the child, to urge them on, and react with irritation when things did not go well. It appears that a father who is domineering and authoritarian in behaviour is not likely to have a son with high-achievement motivation. The fathers of the high achievement motivated boys, although they set high standards for their sons and had high expectations for his performance, tended to be less rejecting, less pushy and less dominant than were the other.
The emphasis upon early independence training led McClelland to characterize differences between total cultures. His general plan was to assess the two variables, training for independence and achievement motivation, on the cultural level. They scored popular folk tales and took the average score as characteristic of the culture. They found a significant positive relationship between the amount of stress on early independence training and the level of achievement motivation in the eight cultures they studied using refined techniques.

Child, storm, and Veroff (1958) selected twelve folk tales from forty-five primitive cultures and coded each story for signs of achievement motivation. The societies were also classified as to whether people in them engaged in full-time entrepreneurial activities (traders, and independent artisans for examples). A significant relationship was found. Even though the cultures varied over a wide range of economic and social systems, the groups high in achievement motivation were much more likely to have such entrepreneurial occupation than the lower-achievement groups.
These findings led McClelland to make one of the more audacious investigations in the history of social sciences.

Taking Max Weber's (1904) famous thesis that the rise of Protestantism caused the rise in capitalism in the Western world McClelland suggested a mediating social-psychological mechanism. He stated that the Protestant ideology should cause parents to stress achievement, self-reliance, and self-denial. If child-learning worked in the past as it seems to work in the present, the Protestant family should have produced sons with high achievement motivation. And this motivation may have found its express in entrepreneurial enterprise and led to the rapid economic growth found by Weber in England, Germany, Switzerland, and the Netherlands.

McClelland promptly tested his hypothesis. In an ingenious study comparing national levels of achievement motivation with national rates of economic growth for two periods, 1920-39 (twenty countries were studied) and 1946-1950 (forty countries were studied) McClelland (1961) found that the level of achievement is predictive of subsequent increase in the rate of economic growth.
This research and subsequent studies provide strong evidence that a motivational variable, achievement motivation, plays a role in the economic development of a country. Although many other variables are involved achievement motivation seems to be related to economic development. The educational implications of this finding are staggering. It seems that the schools by developing high levels achievement motivation in their students can influence the future economic growth of a country.
3.11. STUDIES ON PUPIL'S MOTIVATION DEVELOPMENT:

Various studies in motivation development give an evidence that through indirect teacher influence and through psychological treatment pupils motivation can be developed. As an evidence the following studies can be cited.

1. Developing concerns through incentive treatment (Desai's study 1969)
4. Developing concerns and sensitivity in pupils of convent schools through teacher orientation (Desai's JMEA experiment, 1976)
5. Psychological education in primary school children (Choksi's study, 1976).
7. Developing pupils mental health through training teachers for indirect influence. (Raijiwala, Pavanasm and H.B. Desai.)
1. Desai conducted an experiment in Kheda district in 1969 and trained teachers in incentive treatment. He developed a model of various verbal and non-verbal incentives to be provided to the pupils for better learning. The incentives included (a) feedback (b) grouping (c) increasing expectation (d) competition and (e) counselling.

As a result of this treatment the pupil's expectation went up as a result they gained in performance. The pupil's performance increased and the teachers indirect influence also increased. The experiment suggests to the investigator that if teachers are trained in indirect in classroom which leads to greater pupil participation, increase in their expectancy and greater score in their academic performance.

2. An experiment on 'Achievement motivation development in high school pupils of Baroda, using Mehta's curriculum was conducted by Desai (1970-71). He trained the teachers in Achievement development of pupils by using more indirect communication.
There were significant behaviour changes in pupils as a result of the training given to the teachers. There was a gain in the mean achievement related imageries instead of unrelated and task related imageries. The increase of components of achievement motive changed the overt behaviour of pupils and this led to an increase in the scores of their academic performance and a change in their classroom behaviour in terms of expectations, goal setting, aspiration etc.

3. Desai (1971) conducted an experiment on 'Developing motivation through new curriculum inputs' in high school pupils of Baroda. He trained the teachers in achievement motivation programme and studied the gains in various components of achievement motive and the changes in pupil's behaviour.

The treatment affected the achievement motivation level of the pupils. There was an increase in the scores in their academic performance and there was a change in their classroom behaviour in terms of expectations, goal getting and aspirations.
4. Desai (1975-77) conducted an experiment on developing Achievement concerns and Sensitivity in pupils of convert Schools through teachers orientation (Desai's JMEA experiment, 1976). He tried out an 'input' model for developing sensitivity and achievement in pupils and studied its effect on certain variables of classroom climate, namely, adjustment, classroom trust, initiative activity levels, anxiety and motivation of the pupils and on their academic performance.

As a result of the training, there was a change in the classroom climate. There was not much difference in the pre-post classroom trust and in the pre-post scores of test anxiety but there was a difference in the pre-post dependency scores.

5. Choksi (1975) conducted an experiment on 'Psychological education in primary school children of Baroda' (Choksi's study, 1976). She prepared a psychological education input model and studied its effectiveness on academic performance as well as on certain psychological traits like motivation, adjustment, classroom trust, initiative level and anxiety.
The psychological education inputs increased the performance of the pupils (Control group mean 194.01, experimental group mean 237.87). There was a significant positive effect on certain psychological traits like n-Achievement (Pre mean 1.23, post mean 10.68), adjustment (pre mean 12.23, post mean 21.70), initiative level (pre mean 8.30, post mean 11.93), classroom trust (Pre mean 21.65, post mean 23.60), and test anxiety level lowered (pre mean 10.30, post mean 7.90). After the treatment, the pupil showed high n-Achievement also level, better adjustment, moderate anxiety level and more initiative than before the treatment. The treatment also lessened the discrepancy in the Goal supposition of pupils and their supposition came to become reality based. The pupils supposition about themselves came to become reality based. The pupils supposition about themselves went high. There was also a change on pupil's perception and behaviour.

(6) S. Laxmi (1976) conducted an experiment on 'Developing motivation inteacher trainees' (Laxmi, 1976) and studied its effect on their performance. She developed achievement motivation among teacher trainees and also on
their self perception and anxiety. She also studied the behavioural changes that occurred as a result of n-Achievement development.

As a result of the input programme, the students showed high-n-Achievement level and moderate risk taking behaviour. It also improved their self confidence and self perception. There was a significant improvement in the performance of both high gain (170) and low gain (201) intelligent students as a result of n-Achievement development.

(7) Three experiments were conducted by Raijiwala (1975), H.B. Desai, (1975) and Pavanam (1975) on developing pupils mental health through training teachers for indirect influence. They studied the effect of the teachers' modified behaviour on pupils' adjustment, pupil's initiative, and pupils' classroom trust.

The training and feedback given to the teachers in indirect behaviour affected pupils' adjustment towards home, school, peers, teacher, and general adjustment, pupils' classroom trust. The indirect approach on the part of the teacher, by encouraging and initiating pupil
2.5. NATURE OF INTELLIGENCE

Many psychologists have suggested various points of view regarding the nature of Intelligence. All the definitions can be classified under three groups.

One group lays emphasis upon the adjustment and adaptation of the individual to his total environment or to its selected aspects. According to this type of definition intelligence is a general mental adaptability to new problems and new situations of life or its the capacity to reorganise one's behaviour patterns so as to act more effectively and more appropriately in novel situations. Thus the more intelligent person is one who can move easily and more extensively vary his behaviour as changing conditions demand.

Another group of definitions of intelligence stresses the "ability to learn".

A person intelligence is a matter of the extent to which he is educable. The more intelligent a person, the more readily and extensively he is able to learn and enlarge his field of activity and experience.
Another type of definition of intelligence maintains that intelligence is the "ability to carry on abstract thinking". This implies the effective use of ideas and efficiency in dealing with abstractions. The abstractions may be verbal, symbolic or numerical.

Above discussed definitions of Intelligence are not mutually exclusive. They overlap at many points as learning itself is a sort of adjustment adaptation to the challenges in the novel situations.

The ability to use symbols is the result of experience in varied situations, and contact with and perception of objects, events, qualities, or relationships for which the symbol stands. An in their turn, symbols help in further learning.

Likewise, ability to carry on abstract thinking contributes to an individuals' ability to adjust to novel situation, because the abstract thinking or use of symbols enables him to integrate his past experiences and learning and thus solve new problems without much blundering or loss of time.
THE TWO FACTORY THEORY:

This theory of Intelligence was given by Spearman in 1904. Spearman proposed a two factor theory. The first factor was a general capacity which was basically a reasoning factor. According to his theory every different intellectual ability involves a general factor (I) which it shares with all other intellectual activities and a specific factors (S), which it shares with none. It is which operates in all mental activities. In the realm of intellectual activity 'I' has the similar role that of physical energy in the physical world. He postualted the existence of specific factors called 'S' factors each of which is specific to a particular type of activity. No person is absolutely uniform in his mental performance. Some persons who are good in natural sciences are poor in social science. Some who excel in mathematics are poor in language. Thus performance in any situation is predicated by the amount of share of 'I' and 'S' in different intellectual activities.

'g' - General factor
'S' - Specific factor
The practical implication of the Spearman two factor theory is clear. So far as test construction is concerned. A test conforming this theory would be one whose materials and several parts are saturated with the general factor, so that measurement thereby would cause the testee's level and quality of 'g' to emerge, while the effects of specific factors 's' would be cancelled out. Thus, the net result of the test would be a measure of 'g'.

Spearman propounded this two factor theory on the finding that various intellectual tests are positively correlated and to a moderately high degree. By a complex process involving the use of retrad equation, he was able to show mathematically that his two factor theory could account for the empirical relationships existing among tests. Because specific abilities are held to independent of 'g' and of each other the theory allows for the observed fact that individuals do show differences in their more specialized aptitudes.

In the light of further findings, this theory underwent revision. Spearman discovered that tests of mental abilities which are highly similar correlate to a greater extent than can be accounted for on the basis
of their common overlap with 'g'. As a result he acknowledged the possibility of group factors. Such as verbal ability and spatial ability. He did not, however, abandon his original position with regard to 'g' and 's'.

GROUP FACTOR THEORY:

The approach assumes that the fundamental dimensions can be represented by a relatively small number of fairly broad common factors arose out of the work of Thorndike, Kelley and Thurstone. Thurstone with his concept primary mental abilities has publicized the group factor view.

According to the group factor theory intelligent activity is not an expression of innumerable highly specific factors as Thorndike claimed. Nor is it the expression primarily of a general factor which provides all mental activity and is the essence of intelligence as spearman held. Instead the analysis and interpretations of Thurstone and other led them to the conclusions that certain mental operations have in common a 'primary' factor which gives them psychological and functional unity and which differentiates from other mental operations. These mental oper-
ations then constitute a group. A second group of mental operations, has its own unifying 'primary' factor; a third group has a third and so on. In other words there are a number of groups of mental abilities each of which has its own primary factor giving the group a functional unity and cohesiveness. Each of these primary factors is said to be relatively independent of others.

From the factor-analysis, Thurstone and his colleagues concluded that seven primary factors or primary Mental Abilities emerged clearly enough for identification and use in test design and construction. Briefly these are:

1. Space : The ability to visualize geometric pattern in space.
2. Perceptual Speed : Quick and accurate noting of details.
3. Number : Quickness and accuracy in simple arithmatic computations.
4. Verbal comprehension : Knowledge of the meaning and relationship of words.
5. Word Fluency : Ability to use many words.
6. Rote Memory : Immediate recall of rote material.
7. Induction : Ability to extract rules.

In spite of the fact that primary mental abilities were originally said to be functionally independent of each other, it was actually found that they are positively and significantly inter correlated. Authors have not been able to devise test materials which will sample the primary mental abilities in pure form. The thorstone therefore, concluded in addition to the 'primary' abilities that there is a second order general factor.

Now two Consequences are indicated:

1. The Conceptual framework has resulted in more clearly specified and defined test categories and types of test items than was the case previously.

2. Several test batteries have been constructed on the basis of group factor theory, particularly the Thurstone's test of primary Mental abilities.
On the basis of the findings of this theory H.E. Garver has postulated a developmental theory of intelligence in which he argues that with increasing age, abilities differentiate out of general abstract intelligence into relatively independent factors.

THE MULTIFACTOR THEORY:

Thorndike's multifactor theory of intelligence is at one extreme of the interpretations regarding the nature of mental organization. As the name of the theory indicates, intelligence is said to be constituted of a multitude of separate factors or elements each one being a minute element of ability. Any mental act, according to this theory involves a number of this minute elements operating together.

Any other mental act also involves a number of the elements in combination. Hence if performance on these two tasks are positively correlated, the degree of correlation due to the common elements involved in two acts. If two types of mental activities A & B are more highly correlated than are A and C the reason according to multifactor theory, would be that the first pair has more elements in common than does the second pair. According to this theory then there is
really no such factor as general intelligence. There are only many highly specific acts the number of acts such depending upon how refined a classification we might make and are capable making.

**Hierarchical Theory:**

The basic idea of the approach is that intellectual structure can be conceived as a piurachy, extending from one or more broad general factors through group factors to more and more specific factors. For example vernon has proposed a model where general ability is at the apex of the hierarchy. This general factor is sub-divided into two major group factors - a verbal educational factor and practical mechanical one. Each of these categories is sub-divided into group factors and then into more and more specific factors, for example, at third level of hierarchy which represents minor groups factors, we might find a spatial factor similar to Thorstone group factor. At the next lower level this factor might be sub-divided into three more specific factors: for example, (1) the ability to comprehend spatial relations using the body as a point of reference.

2. The ability to mentally manipulate a series of visual objects through a sequence of motions.

(3) The ability to make left-right discrimination.
The hierarchical approach represents an intuitively satisfying collection of data and since test can be constructed to represent any level in the hierarchy, it is a useful tool for guiding test construction.

**SAMPLING THEORY**

This theory was proposed by G.H. Thomson. Thomson assumed the mind to be made up of many independent powers. Any particular test or school examination samples. Some of these powers and bonds. In so far as two test sample the same bonds then a general or common factor can be said to exist between them but in so far as they sample different bonds then the test have nothing in common and each is specific e.g.

2.5.2. **GUILFORDS STRUCTURE OF INTELLECT**

The most recent theory is Guilford's three dimensional model. Guilford conceives of intellectual functioning as having three dimensions: Operations content and Products. Operations are process involved in intellectual behaviour in Guilfords system, cognition, memory divergent thinking, convergent thinking or evaluation. The content of these operations may be figural, symbolic, semantic or behavioural. And third, the products, may be units, classes, relations system. Transformations or implications.
Thus the model contains 120 cells (5 operations x 4 contents x 6 products) each of which represents a distinct factor that is measured by separate tests. The model can be represented as below:

Guilford suggest that the five processes act on the four units to produce one of six cognitive products. The six products are units of a single word or idea classes, a relationship between or among units or classes, systems, an organized sequence or idea, transformations a change or redefinition or a unit or class and implications, predictions of the future.

Guilford believes that each person is a unique composite of a great many different intellectual abilities. Each intellectual functioning involves three components; a cognitive operation, specific content and a specific product. A child who is exceptionally good at memorizing long poems would illustrate the operation of memory with a semantic content and a relational product.
2.5.3. INHERITANCE OF MENTAL ABILITY:

The perennial question of inheritance of intelligence is still unanswered - present day investigators have used the following means in securing relevant data: The correlation technique, family history studies, Co-twin Control Procedures and foster-Children experiment.

The first technique involves ascertaining the correlation between intelligence test scores for groups of individuals of differing degrees of blood relationship.

A Coefficient of +0.9 between intelligence scores of identical twins was reported. A less resemblance is reflected in a coefficient of +0.6 for fraternal twins. Between the test scores of typical pairs of brothers and sisters, +0.5 is reported for cousins, +0.25 and for parents and offspring; +0.4. (Freeman, F.N., et al, 1928)

Thus increase in amount of blood relationship is associated with increased similarity in intelligence test scores.

Whipple says that all other factors are dwarfed in comparison, by the side of heredity.
The results of family-history studies approach revealed the dominant influence of heridity.

The Kallikak-Jukes-Edwards galleries have been offered as crucial evidence.

"Two family lines established by a soldier in the revolutionary war were compared. One line established by a feeble-minded woman contained 480 direct descendants, among which only 46 normal individuals were found. Among 496 direct descendants of the line established by a normal woman, all were normal with the exception of fine.

Terman found that of 62 members in the Hall of Fame, 22.5 percent were related to 643 gifted children identified and studied in California.

A promising method of studying heridity was developed by Arnold Gesell. It is of unusual significance because of his technique — that of co-twin control. The development of identical twins was found to be so similar in emotional expression in mental growth and in certain moral acquisitions (such as stair, claiming). That Gesell concluded that environmental stimulation could not possibly explain the striking correspondence. Remarkable likeness persisted even when one
twin member had undergone special training in stair-climbing, and another in vocabulary development. Regarding the Vocabulary study strayer, working with Gesell wrote; "The twins were sub-average (mentally) and not all the special training was able to bring them up to the average vocabulary of children, three and one-half months younger than they". It appeared therefore, that "inner growth" or "maturation" sets level which special training did not enable children to transcend.

Although Gesell's results are extremely interesting and pertinent, they must be viewed with reservation, since they are based upon observation of a small number of case studied for a short time.

Schwesinger, (1953) reports the records of ten pairs of identical twins reared apart from birth or from infancy and brought-together and studied at maturity. In six pairs, no significant difference in test-intelligence was noted; in two pairs, twelve-point difference in test-intelligence quotients are cited; and the remainder differ by fifteen or seventeen points".
Perhaps the most significant study on the topic is that of Newman, Freeman and Holzinger. They studied a large number of twins, including fifty pairs of identical twins reared together fifty pairs of fraternal twins reared apart after having been separated early in life. The investigators concluded that height and weight were affected little by differences in educational and social environments. Intelligence test performance, however, was differentiated to a marked degree by differing social environments. Educational achievement was very greatly differentiated by differing educational environments but only moderately by differing social environments. According to data of this study, identical twins reared apart resemble one another less than siblings reared together. These investigators believe that differences would have been more marked for the twins reared apart had there been greater dissimilarity in their environments.

To interpret these data validly, it would be necessary to know the "Similarity" and the "differences" in the environment of the several types of twins.
2.5.4. INFLUENCES OF ENVIRONMENTAL FACTORS AND CONDITIONS ON IQ

For many years the controversy concerning the stability of the IQ assumed high rank among educational disputes. The issues in this controversy were cast in bold relief by widely publicized data from the University of Goa.

The study of B. Wellman made at the University of Goa, yielded substantial gains for orphanage children who were provided with nursery school experience. A trend was found which suggests that small positive changes in IQ accrue on intelligence tests following nursery school experience.

The IQ that a child receives is in part a product of the particular test which he takes. Since there is sometimes only a low positive relationship among the results of various tests, it would be proper for the student to view the child's mental age as a measure of status attained in the special abilities measured by the test. The teacher should not anticipate that the child will always attain the same rating on other intelligence tests, nor should be anticipate that repetition of the same test will always elicit the same results.
Intelligence results are highly modifiable, in the early years ratings are shown to improve with educational opportunities.

A study of Negro children by S.D. Scruggs, (1961) reveals that among school children improvement in reading ability and general academic proficiency are associated with gains in I.Q. In fact, gains of intelligence test scores seem possible even in college, where in steady increases have been reported for students during the four-year period.

R.L. Thondike, (1963) remarks that some studies have agreed in findings that those students who remains through a college-course tend to gain in intelligence score. In addition it has been pointed out that the internal between test and retest influences the accuracy of prediction.

The studies on group of growing covering the ages 21 to 72 months, and that of Freeman and Flory, for ages 8 through, 17 years and will man's from preschool to college disclose the variability of I.Q.

Heahy made a study of children in foster homes.
One surprising result of these studies is the frequency with which high I.Q.'s have been obtained. Heahy gives data for a group of children of ages five to fourteen all of whom were adopted before they were six months of age. The mean I.Q is 110.5. Skeels cites an average I.Q of 115.4 for 147. Children adopted before they were six months of age Forty-one received I.Q's of 120 or above.

Skodak's, (1956) analysis supports these findings. For 80 of the true mothers of certain foster children, mental test results were available. The average I.Q. of this group was 87.7 The majority of the mothers fell "below average", 538 percent had I.Q's below 90, 16.3 percent were border line, and 13.8 were feeble minded yet the average I.Q of their children was 116.

The extent of the deviation in the I.Q's of foster children and true parents is note-worthy; it suggests the operation of a number of related forces under circumstances which may be profitably analysed. In attempting to account for these differences one should recall that these children were adopted in infancy and that there early, most formative years were spent in an environment in which their foster parents may have been more zealous than typical parents to
provide the best environment for the study growth and development of the children whom they truly wanted. It is justifiable to assume that affection, love and concern, generously but judiciously bestowed on growing children have very desirable effects upon wholesome nurture.

It would be logical to assume that especially poor environment would retard development. And this seems precisely the result obtained in comparison of younger and older children in several impoverished environments. Asher's study of Kentucky mountain children (1935) Sherman and Key's study of isolated mountain children (1932) and wheelers account of east Tennessee children and elaboXativeto the earlier studies of cannal-boat, gypsy and other Sibling groups.

These studies lead one of the modify a rather prevalent concept about the constancy of I.Q. Since these studies suggest that alternations in I.Q occur at every age level, it would seem best not to attempt to predict future development of children from the results of a single intelligence test.