CHAPTER-II

CONCEPTUAL FRAMEWORK OF PREDICTORS

Present chapter deals with the conceptual framework of various variables taken in the present study i.e. academic achievement, cognitive styles, learning styles and study skills so as to get the conceptual understanding of these variables before seeing their relationship.

2.1. ACADEMIC ACHIEVEMENT

The primary concern and the most important goal of education is academic achievement of pupils despite many varied statements about the aims of education. Academic achievement is also considered to be the main area of educational research by the researchers. Stephens (1960) states, not than other aspects of educational objectives are to be ignored but the fact remains that academic achievement is the unique responsibility of all educational institutions established by the society to promote a wholesome scholastic development of the pupils.

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

In the view of Biswas and Aggarwal (1971), it is knowledge attained or skills developed in the academic subjects usually designated by test scores. In other words, academic achievement refers to the degree or level of success or proficiency attained in some specific area concerning school or academic work.

Pressey, Robinson and Horracks (1959) define achievement as "the status or level of person's learning and his ability to apply what he has learned". According to them achievement would not only include acquisition of knowledge and skills but also attitudes and values as aspects of achievement. Achievement as manifested by the application of acquired skills and knowledge is a product of learning attitudes and interests since these factors would implicitly influence the extent of achievement.

According to Travers and Robert (1964), the term achievement refers to any desirable learning that occurs. It is obvious that whether a particular learning is referred to as an achievement or not, depends upon whether some body considers it desirable or not. Hence, any behaviour that is learned may come within a definition of achievement.

Good (1973) defines academic achievement as knowledge attained or skill developed in the school subjects, usually designated by the test scores or by marks assigned by the teacher or both.
According to Kerlinger et al (1973), “It is an abstraction formed from the observation of certain behaviours of children. These behaviours are associated with the mastery or learning of school tasks—reading words, doing arithmetical problems, drawing pictures and so on. The various observed behaviours are put together and expressed in a word-achievement”.

Hawes and Hawes (1982) defined achievement as “Successful accomplishment or performance in particular subject area or course, usually by reasons of skills, hard work and interests – typically summarized in various types of grades, marks, scores or descriptive commentary”.

According to Oxford Advanced Learner’s Dictionary (1997) “Achievement is a thing done successful especially with efforts and skills”.

Two fundamental assumptions of psychology made it necessary to measure academic achievement. First, there are differences within the individual from time to time known as behaviour oscillation i.e. academic achievement of the same individual differs from time to time, from one class to another and from one educational level to another. Secondly, there are individual differences. Individuals of the same age group, of same grade, usually differ in their potential abilities and academic proficiency whether these are measured by standardized measure of achievement by teacher's grading or by marks obtained in tests and examinations.

2.2. COGNITIVE STYLES

The things we do in our heads - mental activities or thinking are referred as cognitive processes. Mohney (1987) stated,
There are numerous indications that psychology is undergoing some sort of revolution in the sense that cognitive processes have become a popular topic. The trend towards the interest in this area, that is, cognition can be well understood because of the attention paid to cognitive styles in publications as those of Kogan (1971), Landfield (1977), Messick and Messick (1976). In essence, cognitive style refers to the way in which individuals organise their experiences.

**COGNITION**

According to the Dictionary of Psychology (Drever, 1968), there are several meanings of cognition like knowing, judging, perceiving, conceiving, remembering, imagining and reasoning etc. Cognition is considered as the part of conscious perceiving, learning and thinking by many psychologists. Every Individual organizes all in the different manner what he sees, remembers and thinks about. According to Kogan and Kogan (1971), 'Cognition is the organization of a stimulus configuration in order to arrive at a basis of similarity among a group of stimuli, and the assignment of a symbolic label to the organized pattern of similar stimuli'.

For theoretical approach to cognition, there are various theories:

1. **The Stimulus and Response Theory:** According to Watson (1962) rather than discussing cognition or thinking in terms of mental processes (which are not accessible to direct study), behaviorists emphasized the basic concepts of stimulus and response. According to this approach knowledge and skills are the results, that is,
whenever a stimulus occurs; it provides the response with which it is associated.

2. **The Motor Theory:** - It was the one version of stimulus response theory in which all behaviour was equated with the muscular or glandular activity. Most human thought was considered to involve some vocal activity: that is, thinking was viewed as talking to oneself. Muscular activity could be an incidental by product of thinking, or an overflow resulting from activities in brain that occur during thinking. The brain being so active during thinking that signals 'spill over' to the muscles through the motor pathways. Images and procedural knowledge, types of cognitive activities are very difficult, if not impossible, to verbalize and to incorporate into a motor theory. Finally, learning and thinking occur even when the body has been paralyzed by a drug, preventing any recordable muscular activity. Thus, motor theory cannot account for many things, we know about cognition.

3. **Mediational Theory:** - It was proposed by Maltzman (1955) as an alternative to motor theory. This theory suggests that important stimuli and responses could occur in the head without motor components. Mediational events or thoughts provide a connecting link between the environment and the way one responds to it. Messick (1976) defines in terms of consistent individual differences and maintains that cognitive structure mediate between environmental input and the organisms output.
He adds that cognitive structures organise behaviour as well as input.

4. **Gestalt Theory**: It originated in Germany after the turn of the century by Gestalt Psychologists like Kohler (1947) and Lewin (1951) and was contemporary with behaviorism in U.S.A. Gestalt psychologists were concerned primarily with perception, but applied Gestalt theory to nearly all significant psychological problems. For them, thinking and problem solving are matters of “seeing” in the right way. Thus, their concerns about the perceptual processes strongly influenced their idea of cognitive styles as those dimensions that characterize a person’s manner of perceiving, thinking and problem solving.

5. **Hypothesis Theory**: It views the organism as an active thinker. Various psychologists (Bruner et. al. 1961) are associated with this theory. In learning a task or solving a problem, the individual is seen as forming and testing hypothesis or ideas about what is happening and how to respond. Hypothesis theory suggests that we perform complex tasks such as problem solving by thinking out in advance various possible courses of action. We test these hypotheses systematically until the correct one is found.

6. **Information Processing Theory**: It framed as under the early influence of behaviorism, such mental concepts as memory and reasoning were considered unscientific and not proper fields for psychological study. Bieri (1971)
noted that a process of information, transformation is a basic assumption of the cognitive theorist. He told that individuals learn strategies, programmes of other transformation operations to translate objective stimuli into meaningful dimensions. These strategies were termed as "cognitive structure" by Bieri (1971).

COGNITIVE STYLES:

Leff, Garden and Ferguson (1974) defined cognitive style as an In-built plan or programme to select specific type of data for processing or to perform specific mental operations on Information’s processed.

Cognitive style denotes consistencies in the individual modes of functioning in a variety of behavioural situations.

Coop and Sigel (1971) seem to equate cognitive style with behaviour rather than mediating process. This definition is similar to the earlier use of the term style by Allport (1937) to explain (describe) consistencies in behaviour; and the earlier concept of silent organisation, used by Gestalists to describe cognitive structures that are not tied to specific content, but rather than guide behaviour (Scherrer 1954). The concept of schemata was utilized by Tolman (1926), who used related concept. The concepts of differentiation and hierarchical organization by Lewin (1936) are also important.

Cognitive styles is the way an individual filters and processes stimuli so that the environment takes on psychological meaning and it is representative of the mediation (Harvey, 1963). As such cognitive representations modify-the
one to one relationship between stimulus and response. If it was not for those cognitive representations, stimuli would be irrelevant for the individual or the individual would respond to stimulization in a robot like fashion. Schilling (1981) conceptualizes cognitive styles as the characteristic preference that individuals have for different types of information. It refers to the modes an individual employs in perceiving, organizing and labelling various dimensions of the environment.

Cognitive styles may entail generalized habits of information processing, to be sure, but they develop in congenial ways around underlying personality trends and are thus intimately interwoven with objective, temperamental motivational structures as a part of the whole personality thereby providing one aspect of matrix.

These structures refer to how cognition is organized; content refer to what knowledge is available. In the first month of life, individual behaviour style can be delineated (Birch et al.1962). In terms of activity level, threshold of responsiveness, rhythmicity of functioning, adaptability, intensity, approach withdrawal, mood, and persistence.

Broverman and Lazarus (1958) have suggested that the cognitive styles manifest itself in two ways as a directive influence on behaviour or as an ability to resist disruption under interference conditions. The cognitive style may be ‘perceptual-motor’ dominant or ‘conceptual’ dominant. Although cognitive styles are viewed as habitual modes of Information processing, they are not simple habits in the technical sense of learning theory because they are not directly
responsive to the principles of acquisition and extinction. Cognitive styles develop slowly and do not appear to be easily modified by specific tuition or training (Kogan and Kogan, 1971; and Kogan, 1971). Across diverse spheres of behaviour, the stability and pervasiveness of cognitive styles suggest deeper roots in personality structure that might at first glance, be implied the concept of characteristics modes of cognition, as it was, that determines the nature or form of adaptive traits, defensive mechanisms. In this view, a core personality structure is manifested in the various levels and domains of psychological functioning - Intellectual, effective, motivational, defensive - and its manifestation in cognition is cognitive style. Thus Adorno et al. (1950) have investigated the authoritarian personality. Gardner, Holtzman, Klein, Linton and Spence (1959) have explored the patterning of "cognitive controls which help the individual to organise and mediate his transactions with the environment."

**Types of Cognitive Styles:-**

Rokeach and his co-workers (1960) have concentrated research attention upon the behavioural, correlates of individual with "dogmatic" (close-mindedness) and non-dogmatic (open-mindedness) cognitive style. Messick (1976) lists 19 such traits in his recent review of reported cognitive style variables. Some of the important cognitive styles are:-

(i) Equivalence range, which is operationally related to sorting or classifying tasks.

(ii) Levelling vs. sharpening concerns reliable individual variations in memory,
(iii) Focusing vs. Scanning, which shows individual differences in the variations in vividness of experience and the span awareness,

(iv) Conceptual styles concerned with categorizing behaviour. The style of conceptualization also has something to do with classification. The person who named as "Conceptual discrimination" is said to prefer sharpened classes, but also on the whole to show preference for relation. Where there are options, with the alternative label of integrative complexity, a style of conceptual integration involve seeing how categories or dimensions of information are related in multiple and different ways.

(v) Cognitive complexity vs. Simplicity is the multidimensional and discriminating way.

(vi) Reflection vs. impulsivity involves individual consistencies in the speed and adequacy with regard to hypothesis formulation and Information processing.

(vii) Convergent vs. divergent represents the degree of an individual's relative reliance upon convergent thinking in contrast to divergent thinking,

(viii) Risk taking represents one's willingness to take chances and to venture responses.

(ix) Constructed vs. flexible control is susceptibility to distraction and cognitive interference.

(x) Strong vs. weak atomization refers to an individual's relative ability to perform simple repetitive tasks compared to his general level of ability.
(xi) Conceptual vs. perceptual motor dominance with reference to novel or difficult tasks,

(xii) Of all the cognitive styles, by far the most important has been Witkin's field independence vs. field dependence.

**Difference between Cognitive Style and Ability**

Cognitive styles and ability differ in a number of ways. Ability dimensions essentially refer to the content of cognition or the question of what - what kind of information is being processed by what operation! In what form? Cognitive styles, in contrast, bear on both the questions of how - on the manner in which the behaviour occurs. The concept of ability implies the measurement of capacities in terms of maximal performance, with the emphasis upon level of accomplishment. The concept of style implies the measurement of characteristic modest operation in terms of typical performance, with the emphasis upon process.

Ability, furthermore; is generally thought of as unipolar, while cognitive styles are typically considered to be bipolar in the sense of pitting one syndrome or complex of interacting characteristics. What Vernon (1972) has called a "dynamic gestalt" against a contrasting complex at the opposite pole of the distribution. Ability vary, then, from zero or very little to a great deal, with increasing levels implying more and more of the same facility.

Another major way to which, cognitive styles differ from ability is in the values usually conferred upon them. Abilities are value directional: having more of an ability is better than
having less. Cognitive styles are value differentiated. Each pole had adaptive value in different circumstances.

Cognitive styles also differ from ability in their breadth of coverage and pervasiveness of application. An ability usually delineates a basic dimension underlying a fairly limited area.

One, other difference between cognitive styles and ability is worth noting, but is historical and essential. Cognitive styles and ability differ in methods by which they are ordinarily measured. However, in actuality, the above distinctions are not so sharply etched: there are varying degrees of difference and overlap between particular cognitive styles and ability in terms of both conception and measurement.

Distinction between Cognitive Styles and Learning Styles

A number of people have created applied models that purposed to the concept of learning styles. For instance brain style, thinking style, creative style and problem solving style models. Further, some have developed models of learning styles and learning modality preferences. This situation has created lot of confusion in the research literature. Various researchers and authors most often have been using the cognitive styles and learning styles interchangeably. Some consider learning styles as subset of cognitive styles. On the other hand, some authors treat cognitive styles and learning styles differently and distinguish between the two. For instance, Entwistle (1981) believe the means of two terms is same and so have used the terms interchangeably; while Das (1999) consider the two to be different and attempt to define them as separate concepts.
'Learning style', seems to have emerged as a more common term or a replacement term for cognitive style in the 1970. Indeed, the impression that is formulated in the usage of those terms is that those working under the umbrella of 'learning style', take cognitive style into consideration, but would probably describe themselves as interested in more practical, educational or training application and thus more action oriented', while the term, cognitive style has been reserved for theoretical and academic descriptions.

According to Riding and Cheema (1991) one main difference between cognitive style and learning style, is the number of style elements considered, that is, cognitive style is bipolar dimension, learning style entails many elements and are usually not either or extremes. One "either has or does not have the element to one's style", similarly, the absence of one element does not necessarily imply the presence of the opposite element".

Cognitive and learning styles have been viewed in three main ways, as a structure (content), as a process or both.

Smith (1992) hold that cognitive style is a distinctive and habitual manner of organizing and processing information while 'learning style' may be defined as distinctive and habitual manner of acquiring knowledge, skills or attitudes through study or experience.

Jonassen and Grabwoski (1993) are of the opinion that most cognitive controls and to a lesser extent, cognitive styles define processing characteristics that are based on task relevant measures, that is, tests that measure the actual skill or
tendency. Learning styles, on the other hand, are general tendencies to prefer to process information in different ways.

According to them learning styles are applied cognitive styles, removed one more level from pure processing ability self-reported measures of learners preferences. These do not test the actual ability, skill or processing ability tendency as do cognitive controls and some cognitive styles. They are less specific than cognitive styles, which are less specific than cognitive controls and abilities.

Sternberg and Grigorenko (1997) also distinguished between the two concepts. They hold that cognitive styles represent a bridge cognition and personality and are concerned with cognitive processing whereas learning styles are directly concerned with learning - modification of behaviour and are action oriented rather than cognition oriented.

**Dimensions of Cognitive Style**

At least a dozen separate cognitive dimensions have been the subject of systematic research study, and perhaps half a dozen more have been identified but not extensively studied. A definition of each of nine cognitive styles has been provided by Messick (1970).

1. **Field-Independence vs. Field-Dependence**

   “An analytical, in contrast to a global, way of perceiving (which) entails a tendency to experience items as discrete from their backgrounds and reflects ability to overcome the influence of an embedding context” (Witkin, Dy and Others, 1962).
(2) Scanning

A dimension of individual differences in the extensiveness and intensity of attention development, leading to individual variations in vividness of experience and the span of awareness (Holzman, 1996).

(3) Breadth of Categorizing

Consistent preferences for broad inclusiveness, as opposed to narrow exclusiveness, in establishing the acceptable range for specified categories (Bruner and Tajfel, 1961).

(4) Conceptualizing Styles

Individual differences in the tendency to categorize perceived similarities and differences among stimuli in terms of many differentiated concepts, which is a dimension called conceptual differentiation (Messick and Kogan, 1963) as well as consistencies in the utilization of particular conceptualizing approaches as bases for forming concepts such as the routine use in concept formation of thematic as functional relations among stimuli as opposed to the analysis of descriptive attributes on the inference of class membership (Sigel, 1963).

(5) Cognitive Complexity Versus Simplicity

Individual differences in the tendency to construct the world, and particularly the world of social behaviour, in a multidimensional and discriminating way (Kelly, 1955; Bieri, 1971; Scott, 1963; Harvey and Schrodes, 1961).

(6) Reflectiveness Versus Impulsivity

Individual consistencies in the speed with which hypotheses are selected and information processed, with impulsive subjects tending to offer the first answer that occurs
to them, even though it is frequently in correct and reflective subjects tending to ponder various possibilities before deciding (Kogan, Roseman, and Others, 1964).

(7) Leveling Versus Sharpening

Reliable individual variations in assimilation in memory. Subjects at the leveling extreme tend to blur similar measures and to merge perceived objects or events with similar but not identical events recalled from previous experience. Sharpeness, at the other extreme, are less prone to confuse similar objects and by contrast, may even judge the present to be less similar to the past than is actually the case (Holzman, 1954; Holzman and Klein, 1954; Gardner, Holzman, and Others, 1959).

(8) Constructed Versus Flexible Control

Individual differences in susceptibility to distraction and cognitive interference (Klein, 1954; Gardner, Holzman, and Others, 1959).

Field Dependent and Field Independent Cognitive Styles (by Witkin, 1954).

A great focus has been paid to the area of field dependent and field independent approach of cognitive styles. The rationale for such focus follows from the accumulation of works surrounding the concept. Vernon (1972) writes, “it is likely that more empirical work has been carried out on field dependence - independence by his colleagues and other psychologists, then on all the other cognitive styles put together.

The first and the foremost is the theoretical framework of psychological differentiation under the ages of which the
concept is evolved and developed. Moreover, this approach to cognitive style is not content-loaded; its structural properties extend it to broader areas of human behaviour and subsets of human population.

Field-independence versus field dependence refers to a consistent mode of approaching the environment in analytical terms. The concept of field dependent and field independent cognitive styles has undergone several historical developments. The interplay of empirical work and theoretical formulation has changed its conceptual nature. In its recent version, field independence and field dependence are bipolar concepts, and field independence refers to the extent of autonomy of external reference.

Originally the concept of field independence was derived from the laboratory studies of (Witkin, Lewis Hertzman, Machover, Meissner, 1954). The consistent manner of establishing the upright contributed to the notion of field-dependence and field-independence as individual difference constructs. Field-dependent people are regarded as the individuals inclined to use the field, whereas field-independent people were considered as individuals tending to use body for perception of the right. The concept was now formulated as an "articulated field approach" at one end, and a "global approach" at the other end.

Witkin and his associates (Witkin et al., 1962) have done systematic research in their studies of individuals having both the field dependent and the field independent cognitive style. He demonstrated that perceptual performance of an individual is
related to highly diverse area cognitive life in a consistent manner, differentiation at work was proposed by Witkin and others (1962). Primitive or early behaviour is described as the global and diffuse type which is lacking articulation between the different areas of activity. But as the development proceeds to higher levels, functions become differentiated and the parts become discernible from the amorphous whole. These become the articulated units. Then Werner (1957) described that the direction of development was found in every psychological phenomenon; perceiving, thinking, learning, feeling and language behaviour. Similarly, this principle was applied in area of cognition by Witkin (1962) to the hypothesis that field independent persons have achieved a higher level of differentiation than field dependent persons, as identified by RFT (Rod Frame Test) and EFT (Embedded Figure Test) the performance of these tests, RFT and EFT requires differentiation of behaviour. So, it is necessary that individual must learn and perceive his environment in discrete manner in order to separate the part from the whole configuration or the one item from the configuration. The field independent person is able to break the field and can attend to the various relevant forms and items existing in the field along with drawing his attention from the irrelevant form. Whereas, the field dependent or relatively undifferentiated person is not able to withhold his attention from the titles, or from surrounding the rod and the complex design containing simple figures in it.

Field independent persons are the analytical individuals, can be able to perform the tasks which require differentiation,
in identifying the presence of logical errors and in understanding the various jokes and puzzles more quickly. But, on the other hand the field dependent individuals also called global type of individuals tend to identify a group exhibiting social orientation and they are more afraid of external influence and are markedly affected by the isolation from other people. (Witkin, Oltman and others, 1971). The persons who are field-dependent, they differ largely from the field-independent individuals in important personal characteristics. In case of attitude formation, field-dependent persons are especially prone to be guided by the positions attributed to an authority figure or peer group (Drever, 1968). The field-independent persons are quite less attentive to human content of environment. The field independent persons literally spend less time in looking at the faces of those with whom they are interacting as compared to the field dependent persons. The fact is, of course, a major source of information about what others are feeling and thinking. The field dependent persons also tend to be better at remembering faces (Crutchfield, Woodworth and Albrecht, 1958). They also reflect superiority over field independent persons in attending to verbal messages that are more social in content. (Engle, Fitzgilbons and Goldberger, 1966).

Family experiences of children who turn out to be relatively field dependent or field independent was demonstrated that the kind of relationship between the growing child and his mother is influential in determining the cognitive styles of the children (Witkin and others, 1962).
Field dependent or the field-independent plays an identifiable role in selection of electives and especially in the vocational preferences. More field-independent studies favour those activities in which analytical skills are called for, whereas field-dependent students avoid such domains. Field-independent people are likely to learn more than the field-dependent people under conditions of intrinsic motivation.

Various characteristics of the articulated and global cognitive styles can be summed up as:

(i) the cognitive styles are concerned with the form rather than the content of cognitive activity. These are based on the individual differences in how one perceives, thinks, solves problems, learns, relates to others.

(ii) Cognitive styles are pervasive dimensions. They cut across the boundaries traditionally and help to restore the human psyche to its proper status.

2.3. CONCEPT OF LEARNING STYLES

Several researchers have defined learning styles in their own ways. There is a little agreement among the researchers with regard to the concept of learning styles. Some researchers include learning styles under the caption of cognitive style. They consider cognitive style as stable construct, which relate to thinking, problems solving, information processing, retaining and learning. On the other hand some researchers hold that the concept of learning style has cognitive, affective, meta-cognitive and physiological dimensions and thus is broader concept than cognitive style. Still there are some researchers who have been using cognitive style and thinking styles interchangeably. Here
an attempt has been made to give some definitions of learning styles so as to make the concept of learning styles more clear.

Laycock (1978) defined learning styles as an individual's characteristic way of responding to certain variables in instructional environment. In view of Schmeck (1982) learning style is a pre-disposition on the part of the learner to adopt a particular learning strategy regardless of the specific demands of the learning tasks.

To sum up, it may be said that learning styles are the preferred ways of learning of an individual student, which are relatively consistent across the learning situations.

**TYPES OF LEARNING STYLES**

Aggarwal and Pandey (1977) analyzed the available literature on the types of learning styles and chose the following eight learning styles. These are:

1. Individualistic Vs Non-Individualistic
2. Field independent Vs Field dependent.
3. Motivation centered Vs Non-motivation centered.
4. Aural Vs Visual
5. Environmental oriented Vs Environment free.
6. Flexible Vs Non-flexible.
7. Short attention span Vs Long attention span,
8. Responsible Vs Irresponsible.

Kolb (1976) has designed a learning style inventory and defined four types of learning styles-

1. The convergent learning style.
2. The divergent learning style.
3. The assimilative learning style.
4. The accommodative learning style.
The convergent learning style relies primarily on the dominant learning abilities of abstract conceptualization and active experimentation. The greatest strength of this approach lies in problem solving, decision-making and the practical application of ideas. We have called this learning style the "Converger" because a person with this style seems to do best in such situations as conventional intelligence tests where there is a single correct answer or solution to a question or problem. In this learning style, knowledge is organized in such a way that through hypothetical-deductive reasoning, it can be focused on specific problems. Converger prefers dealing with technical tasks and problems rather than with social and interpersonal issues. Convergers often have specialized in the physical sciences. This learning style is characteristic of many engineers and technical specialists.

The divergent learning style has the opposite strengths of the convergent style, emphasizing concrete experiences and reflective observations. The greatest strength of this orientation lies in imaginative ability and awareness of meaning and values. The primary adaptive ability of this style is to view concrete situations from many perspectives and to organize many relationships into a meaningful "Gestalt". The emphasis in this orientation is on adaptation by observance rather than by action. This style is called "diverger" because a person of this type performs better in situations that call for generation of alternative ideas and implications such as a "brainstorming" idea interested in people and tend to be imaginative and feeling oriented. Divergers have broad cultural interest and tend to specialize in the arts. This style is characteristic of individuals
from humanities and liberal arts backgrounds. Counselors, organization development specialists and personnel managers tend to be characterized by this learning style.

In assimilative learning style the dominant learning abilities are abstracts conceptualization and reflective observation. The greatest strength of this orientation lies in inductive reasoning, in the ability to create theoretical models, and in assimilating disparate observations into an integrated explanation. As in convergence, this orientation is less focused on people and more concerned with ideas and abstract concepts. Ideas, however, are judged less in this orientation by their practical value. This learning style is more characteristics of individuals in the basic sciences and mathematics rather than the applied sciences. In organization, person with this learning style is found most often in the research and planning departments.

The accommodative learning style has the opposite strength of assimilation, emphasizing concrete experience and active experimentation. The greatest strength of this orientation lies in doing things, in carrying out plans and tasks, and in getting involved in new experiences. The adaptive emphasis of this orientation is an opportunity seeking, risk taking and action. This style is called “accommodation” because it is best suited for those situations in which one must adopt oneself to changing immediate fit the facts. Those with an accommodative style are more likely to discard the plan or theory. People with an accommodative orientation tend to solve problems in an intuitive trial and error manner, relying on other people for information rather than on their own analytic ability.
Kolb's Model of Learning styles

One of the most influential models of learning style was developed by David Kolb in the early 1970's. His theory of experiential learning and the instrument which he devised to test the theory - the learning style inventory (LSI) has generated a very considerable body of research. According to Kolb (1981) learning is the process where by knowledge is created through the transformation of experience. Knowledge results from the combination of grasping experience and transforming it. He proposes that experiential learning involves two major dimensions: perceiving and processing. The first describes concrete and abstract thinking and the second an active and information processing activity. Effective learners need four kinds of ability to learn: concrete experiences (CE), reflective observation (RO), abstract conceptualization (AC) and active experimentation (AE). These four capacities are structures along with two independent axis (dimensions) as in the following figure.

![Fig Showing 2 Dimensions, 4 Modes and 4 Learning Styles and Four Stage-Cycle of Learning](image-url)

- Concrete Experience (CE)
- Active Experimentation (AE)
- Abstract Conceptualization (AC)
- Reflective Observation (RO)
- Four Stage Cycle
They are known as learning modes. The combinations of specific two learning modes generate a unique learning style. For example concrete experience and reflective observation (CE & RO) produce diverger learning style, reflective observation and abstract conceptualization (RO & AC) create assimilator learning style, abstract conceptualization and active experimentation (AC & AE) generate converger learning style and active experiment and concrete experience (AE & CE) produce accommodation learning style. According to Kolb, learning by its very nature is full of tension and these tensions are resolved by preferring or choosing a learning style over the other. Kolb has described, the process of experiential learning as a four-stage Cycle which starts from the concrete experience followed by reflective observation, abstract conceptualization and active experimentation. The characteristics of four basic learning styles have been presented as under:

Kolb has argued that his theory of experiential learning provides a useful framework for the design and management of all learning experiences.

The four learning styles have been briefly described in the following paragraphs:

(1) Imaginative Learning Style

Imaginative learning style depends upon concrete experience and reflective observation. The greatest strength of the learner with imaginative learning style lies in their imaginative ability. They perform best in situations when they have to generate ideas. They need to seek background informations and sense opportunities, investigate new patterns,
recognize discrepancies and problems and generate alternatives. They have broad cultural interests and tend to specialize in the arts. They are interested in people and tend to be imaginative and emotional. They are very intense, over enthusiastic and dedicated in their work. They are creative, innovative and tend to initiate ideas. They are people oriented and like to promote interaction among groups to reduce conflicts and disagreements and seek harmony. They believe in trusting and encouraging their team members.

(2) Analytical Learning Style

Learners with analytical learning style perceive information abstractly but process it reflectively. Their greatest strength lies in their ability to create theoretical models. They can assimilate disparate observations into an integrated explanation, by which they excel in inductive reasoning. They value continuity and sequential thinking and need to seek opinions from experts. They are more interested in abstract concepts than in people. They are less concerned with the practical use of theories and more concerned with whether the theory is logically sound and precise. They like to work in their traditional classroom mode. They seek personal effectiveness as well as goal attainment. They solve problems through logic and lead by principles and facts.

(3) Precision Learning Style

Precision learning style depends upon the use of abstract and active experimentation modes. Learners with this style perceive information abstractly but process it actively. Their greatest strength lies in the practical application of ideas. They
seem to do best in those situations where there is a single correct answer or solution to question or problem. Their knowledge is organized in such a way that through hypothetic deductive reasoning they can focus on specific problems. They are seen as relatively unemotional, preferring to deal with things rather than people. They are pragmatics who seek -results. Ideas must have utility; they have little patience for vague and fuzzy ideas. They tend to have narrow interests and often choose to specialize in the physical sciences. They adhere strictly to deadlines and time table. They prefer people who can understand and implement ideas as quickly as possible.

(4) **Dynamic Learning Style**

Dynamic learning style depends upon the use of concrete experience and active experimentation modes. Learners with dynamic learning style perceive information concretely but process it actively. Their strength lies in doing things; carrying out plans and experiments and getting Involved in new experiences. They take more risk than people with other three learning styles. They excel in situations where they have to adapt to specific circumstances. They tend to solve problems in an intuitive, trial and error manner, relying heavily on other people for information rather than their own analytical ability. In situations where theory or plans do not fit the facts, they are like to discard the plan or theory. They are at ease with people but some time seen as impatient and pushy. People with this learning style are action-oriented. They are stimulated by challenging and risk taking tasks. They solve problems by
looking at all possibilities and studying the trends. They are accomplishment oriented. Learners with this style aim at implementing solutions and committing resources.

According to Felder (1996) a mismatch between the learning styles of students and their instructor can interfere with learning and raise the discomfort level of students. Alternatively, when the learning styles of students are similar to those of an instructor, they may exhibit greater achievement and personal satisfaction. In recent years technology is expected to affect the educational processes significantly. So, it is desirable to identify the learning styles. Felder (1996) defined a student’s learning style by the answers to four questions, what type of information does the student prefer: Sensory (sights, sounds and physical sensations), or intuitive (memories, ideas, and insights)?

❖ How is information received: visual (pictures, diagrams, graphs, and demonstrations), or verbal (sounds, written and spoken words, formulas)?

❖ How do they process information: actively (through engagement in physical activity of discussion) or reflectively (through introspection)?

❖ How does the student progress towards understanding: sequentially (in a logical progression of small incremental steps), or globally (in large jumps absorbing material randomly)?

It is important to understand that the dimensions of this model are a matter of degree and not either/or categories. A student’s preference for the different styles may be strong,
It may also change with time, and may vary from one subject or learning environment to another. The most commonly used categories of learning styles are based on sensory preferences i.e. visual, auditory and kinesthetic preferences.

(A) **Visual Learner**

Visual learners relate most effectively to written information, notes, diagrams and pictures, typically they will be unhappy with a presentation where they are unable to take detailed note to an extent. Information does not exist for a visual learner unless it has been seen written down. This is why some visual learner takes notes even when they have printed course notes on desk in front of them. Visual learners will tend to be most effective in written, communication, symbol manipulation etc. **Ness (1995)** includes a separate category of "written words" in which the learner has a preference to learning by reading as opposed to actually seeing objects or participating in activities. Visual learners make up around 65% of population.

(B) **Auditory Learner**

Auditory learners relate most effectively to the spoken words. They will tend to listen to a lecture and then take notes. Often information written down will have little meaning until it has been heard. Auditory learners may be sophisticated speakers and may specialize effective in subjects like law and politics. **Cooker (1996)** describes them "the listeners" preferring to rely on sounds to learn. Auditory learners make up about 30% of the population.
Kinesthetic Learner

Kinesthetic learners learn effectively through touch and movement and learn skills by imitation and practice. Predominantly, kinesthetic learners can appear slow in that information that is normally not presented in a style that suits their learning methods. They learn best when they are totally involved in an activity. Kinesthetic learners make up 5% of the population.

2.4. STUDY SKILLS

According to the Dictionary of Education (Good, 1973) study means, application of the mind to problem or subject; a branch of learning; investigation of a particular subject or the published findings such as investigation.

According to Crow (1969) cited by Dinesh (2003) study implies investigation for the mastery of facts, ideas or procedures that as yet are unknown or only partially known to the individual. Any application of energy directed towards the learning of new material, the solution of a problem, the discovery of new relationships or similar purposeful activities can be considered to be 'study'.

Chief purposes of study are:

To acquire knowledge, which will be useful in meeting new situations, interpreting ideas, making judgments and creating new ideas and in general enrichment of life; to perfect skills and to develop attitude.

The study skills mean what skills of the students for the study are. Study skill means the ways of studying whether systematically or unsystematically, efficiently or otherwise. The
study skills can be interpreted as a planned programme of subject mastery. Good study skills result in the form of good scholastic achievement. The study skills play two fold functions in education. They assist in acquisition of knowledge to the best of one's capacity and to learn, to study effectively, which is far more important than to acquire particular body of information.

General ability is mostly concerned with an innate ability while skills are generally formulated, acquired, cultivated and fixed by repeated efforts. There may be sizeable number of students below the line of average, with average general ability skill; however, they might get good scores in their scholastic achievement because of their good study skills. Not at all students having above average general ability with poor study skills may be expected to do better in the studies. This potential general ability is got to be transmitted into the kinetic one. The medium through, which this transformation is possible, is 'study skills'.

Often the parents and teachers are at a loss to understand the reason for discrepancy between the ability of their children and their actual accomplishment. At least, part of the contribution to the condition is likely to come from poor study skills or lack of training in study. Occasionally, a slight change in the way of studying makes an ordinary performance into a superior one. More often, however, experiences are gained only by training down perhaps ruthlessly; efficient method of work and serving an apprenticeship in learning effective study skills.

Research shows that good students differ from poor students merely in the effective use of study times than in the
amounts. Study conditions affect in three ways the abilities to get down work and to concentrate:

(a) Distraction tend to draw the students' attention away from his work
(b) Poor lighting, inadequate ventilation and noise tend to be fatiguing
(c) Study materials not readily available break the continuity of work.

Beside these, surroundings act as stimulus, which set off habits and attitude of study (Dinesh 2003).

Another important factor in the development of good study habits is concentration. The successful student must concentrate on a definite area set by his programmers and his instructors. In the real sense, the ability to concentrate depends on the extent of interest. There can be no concentration without interest (Dinesh, 2003).

Observation or observing phenomena adds one more variable to the study skills of students. The ability to gather information by looking is universally accepted to be a valuable skill. The making of notes and keeping of note books are study skills and are necessary for keeping a great deal of information in convenient forms. A successful student is supposed to be confident in the skill of notes taking and note book keeping. It is natural and reasonable then, to write, to speak and to think well. The ability to manipulate data mentally and arrive at a conclusion to which men of equal intelligence will subscribe is the principle of man's intellectual effort (Dinesh, 2003).