CHAPTER I

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1.1 INTRODUCTION:

The World Bank Report ‘Knowledge for Development (1999)’ aptly remarks that the developing countries must strengthen the processes of acquiring knowledge, absorbing knowledge and communicating knowledge among their people in order to decrease the information gap between the developing societies and developed societies because in the present day world, knowledge is the most powerful means to development. This is so because in today’s world, economies are built not merely through the accumulation of physical capital and human skills, but on foundation of information, learning and adaptation.

Further, the knowledge which is key to growth and development of developing countries depends largely on different types of thinking such as convergent / scientific thinking and divergent / creative thinking and their development. These in turn depend on thinking styles of the individual learners. Thinking styles are preferred ways of exploiting thinking abilities. This way, one may conclude that understanding, development and application of variety of thinking styles of individuals go a long way in all round development of the nation.

Moreover, many of the students we are consigning to the dust heaps of our classrooms, have the abilities to succeed. It is the teachers, not they (students) who are failing. Indeed teachers are failing to recognize the variety of thinking and learning styles they (Students) bring to the classrooms and reaching them in ways that don't fit them. Therefore, Sternberg (1997) very rightly suggested the educational implication stemming from the convergent-divergent thinking styles are far reaching. Convergent thinking styles are considered most conducive for sciences, maths and teaching and divergent thinking styles for arts.
Hudson (1966) has found that in general individual with convergent thinking styles prefer formal problems and tasks that are better structural and demand greater logical ability than the more open-ended problems forwarded by divergers. Convergers apparently that we need to take into account student’s styles of thinking if we hope to reach them, especially in teaching. Thus situation warrants that investigations be carried out on thinking style of students.

1.1.1 MODELS OF THINKING STYLE

1.1.1.1 Guilford’s Model of Thinking Styles

The term Convergent-divergent thinking was proposed in the early 1950’s, when he introduced his word of intellect.

Guilford described the convergent thinker as one who can be distinguished by his ability in dealing with problems requiring one conventional correct answer clearly obtainable from the information provided.

The divergent thinker, however, is defined as one being highly adept in problems requiring the generation of several, equally acceptable answers where the emphasis is on quantity, variety and originality of responses. Whilst the convergent / divergent processes are not exclusive as certain convergent and divergent thinking arc more emotionally inhibited than divergers and appear to keep the different aspects of their lives compartmentalized’.

Getzels and Jackson (1962) found that teachers prefer learners who are having divergent thinking style than those who have convergent thinking style.

1.1.1.2 Das, Kirby and Jarman (1975) Model of Thinking Styles

This model states that information is integrated in the brain in two ways, through simultaneous and successive processing.
Simultaneous processing style can be characterized involving the synthesis of separate elements into groups that generally have spatial overtones, with all portions of the synthesis being surveyable or accessible without dependence on their position within the synthesis. This type of processing is required for instance, in the formation of any gestalt, or in the discovery of the relationships among two or more objects.

Successive processing style, on the other hand, involves the integration of separate elements into groups whose essential nature is temporal. Portion of this synthesis are accessible only in the temporal order of the series - each element leads to only one other and access to any element is dependent on the preceding elements. Successive processing is necessary for the information or production of any ordered series of events.

1.1.1.3 Kirton (1980) Model of Thinking Styles

Kirton identified two approaches to problem solving, namely - Adaptation arid Innovation. Both have been assumed on a continuum. At one end of the continuum are individuals characterized as Adaptor. These individual tend to solve problems within the boundaries established by conventional approaches. At the other end of the continuum are those individuals characterized as innovators. These persons tend to adopt idiosyncratic and unconventional approaches to problem solving.

In order to assess these thinking styles, Kirton developed an inventory, which is known as Kirton Adaption-Innovation Inventory. The inventory has 32 items and one blind item. There are three subscales in it:
1. Originality (creativity),
2. Efficiency (precise, reliable, disciplined) and
3. Rule-Group Conformity (has the proper respect for authority and rules).

1.1.1.4 Harrison and Bramson (1977, 1982) Model of Thinking Styles

Harrison and Bramson defined thinking style as ways of apprehending that include a variety of perceptions and cognitions. They
identified five preferred thinking styles viz. synthesists, idealists, analysts, realists and pragmatists. The synthesist style focuses upon essential factors, underlying assumptions, an abstract, conceptual aspect. Idealists focus on process, relationships, values and aspirations. Analysists are interested in method and plan: they seek predictability through ordinary data and focus on Concrete detail. Realists focus upon immediately apprehended facts and point to realists and resources. The pragmatists focus upon incremental, step-by-step thinking and immediate pay off and tactics.

They developed enquiry mode questionnaire to measure relative preference for five main modes of enquiry. The assessment required that each of the five pairs of 18 hypothetical situations be rated according to which is most like you and which is least like you.

1.1.1.5 Torrance et al. Model of Thinking Styles

Torrance et al. based their model on the specialized functioning on the cerebral hemispheres. Following traditional accounts they assume that the left cerebral hemisphere is the locus of logical, analytical and linear prepositional thought That is, the 4 left hemisphere seems to process information sequentially and logically (Torrance et al. 1978. p. 1).

In contrast, the right cerebral hemisphere is the center of Visio spatial and oppositional thought and imagination. The right hemisphere seems to process information non-linearly, simultaneously handling a variety of kinds of information. (p.1).

**Torrance et. al. (1978)** list specialized functions of the left and right hemisphere and they imply that persons who are right hemisphere dominant are creative (cf. "such solutions require creative thinking and the simultaneous processing of many kinds information, a specialty of right hemisphere." (p:40). While they are careful to note that in creative thinking both kinds of functioning are required, the clear implication is that right dominant persons tend to be more creative, or more likely to he creative.
1.1.1.6 Basadur and Associate (1990) Model of Thinking Styles

The research done by Basadur and his associates has introduced the concept that a unique personal style of creative Problem solving can be identified for each individual. According to this model creative problem solving is a dynamic tension between seemingly opposing forces. They stipulated two major dimensions of the process of problem solving. The first dimension is comprised of two opposite ways of gaining knowledge for ideation and evaluation.

The quadrant I orientation toward creative problem solving is called generator. The quadrant II orientation is called conceptualizer. The quadrant III orientation toward creative problem solving is called optimizer and the quadrant IV orientation is called implementer.

For assessing the creative problem solving style, the authors developed “The Creative Problem Solving Profile Inventory” Eighteen sets of 4 words are associated with the four concepts.

1.1.1.7 Epstein et at. (1996) Model of Thinking Styles

Epstein et al. identified two modes of winking styles. They are popularly known as intuitive-experimental and analytical-rational thinking styles. This is based on cognitive-experimental self-theory of personality.

In experimental system emphasis is laid upon following characteristics holistic, automatic effortless, affective, pleasure-pain oriented, associationistic connections, behaviour mediated by “vibes” from past events, encodes reality in concrete images, metaphors and narratives, more rapid processing, oriented toward immediate action, slower and more resistant to change, change with repetitive or intense experience, more crudely differentiated, broad generalization, gradient, stereotypical thinking, more crudely integrate, disassociative emotional
complexes, context-specific processing, experienced passively and precociously, we are sized by our emotions and self evidently valid “experiencing is believing”.

On the other hand rational system is analytic; intentional, effortful; logical reason oriented; logical connection: behavioural mediate by conscious appraisal of events, encodes reality in abstract symbols, words and numbers, slower processing, oriented toward delayed action, changes more rapidly and easily strength of argument and news evidence, more highly differentiated, more highly integrated; context-general principles: experienced actively and consciously we are in control of our thoughts and requires justification via logic and evidence.

Initially Epstein Meier (1989) developed constructive thinking style inventory, which contained 108 self-reporting items. Latter on the basis of factor loading, short version of the inventory containing 31 items for measuring the two thinking styles was prepared.

1.1.1.8 Sternberg (1988) Mental Self-Government Model of Thinking Styles

The basic idea of the theory of mental self-government is that the forms of government we have in the world are not coincidental. Rather, they are external reflections of what goes on in people’s minds. They represent alternative ways of organizing our thinking. Thus the forms of government are mirrors of our mind.

According to Sternberg (1997) there are numbers of parallels between the organization of the individual and the organization of society. For one thing, just as society needs to government itself, so we do need to govern ourselves. We need to decide on priorities, as does a government. We need to allocate our resources just as does a government and just as there are obstacles to change in govern so are there obstacles to change within ourselves.
Here overview of mental self-government theory of thinking styles is being presented. Thirteen styles of thinking have been stipulated in above-mentioned theory based on functions, forms, levels and leanings.

**Functions Based Styles**

There are three functions of government: executive, legislative and judicial. Corresponding to these, there are three styles of thinking.

1. **Legislative Style:** People with this style of thinking like to come up with their own ways of doing things and prefer to decide for themselves what they will do and how they will do it. People with this style like to create their own rules and prefer problems that are not pre-structured or prefabricated.

2. **Executive Style:** People with executive style like to follow rules and prefer problems that are pre-structured or prefabricated. They like to fill in the gaps within existing structures rather than to create the structures themselves.

3. **Judicial Style:** People with this style like to evaluate rules and procedures, and prefer problems in which analyzes and evaluate existing things and ideas. The judicial stylist likes activities such as writing critiques, giving opinions, judging people and their work and evaluating programs.

**Forms Based Styles**

There are four forms of mental self-government: monarchic, hierarchic, oligarchic and anarchic. Each form results in a different way of approaching the world and its problems. Depending on forms, there are four thinking styles. These are described as follows:

1. **Monarchic Style:** Person with monarchic style is someone who is single minded and driven. The individual tends not to let anything in
the way of his or her in solving a problem. Monarchic people can be
counted on to get a thing done, given that they have set their mind to it.

2. **Hierarchic Style:** The person with hierarchical style has a hierarchy
of goals and recognizes the needs to set priorities as all goals cannot
always be fulfilled, or at least fulfilled equally well. This person tends
to be more accepting of complexity than is the monarchic person and
recognizes the need to view problems from a number of angles so as
to get priorities correctly.

3. **Oligarchic Style:** The person with Oligarchic style is like the
hierarchic person in having a desire to do more than one thing within
the same time frame. But unlike, hierarchic people, oligarchic people
tend to be motivated by several often-completing goals of equal
perceived importance. Often, these individuals feel pressured in the
face of competing demands on their time and other resources. They
are not always sure what to do first, or how much time to allot to each
of the tasks they need to complete. However, given even minimal
guidance as to the priorities of the organization in which they are
involved, they can become as effective as or even more effective than
people with other styles.

4. **Anarchic Style:** The anarchic style person seems to be motivated by a
potpourri of needs and goals that can be difficult for him or her as well
as for others to sort out. Person with anarchic style take what seems
like a random approach to problems; they tend to reject systems, and
especially rigid one and to fight back at whatever system they see as
confining them.

**Styles based on Levels**

There are two thinking styles based on levels of mental self-
government.
1. **Global Style**: Individuals with global style prefer to deal with relatively large and abstract issues. They ignore or don’t like details and prefer to see the forest rather than trees. Often, they lose sight of the trees that constitute the forest.

2. **Local Style**: Individuals with local style like concrete problems requiring working with details. They tend to be oriented toward the pragmatics of a situation, and are down-to-earth. The danger is that they may lose the forest for the trees.

**Styles based on Scope**

Based on scope of mental self-government, two styles of thinking have been identified - internal and external.

1. **Internal Style**: Individuals with internal style are concerned with internal affairs that is to say, these individuals turn inward. They tend to be introverted, task-oriented, aloof and sometimes, socially less aware. They like to work alone. Essentially, their preference is to apply their intelligence to things or ideas in isolation from other people.

2. **External Style**: Individuals with external style tends to be extroverted, outgoing and people oriented. Often, they are socially sensitive and aware of what is going on with others. They like working with other people whenever possible.

**Styles based on Leanings**

Based leaning of mental self-government two styles of thinking have been identified - liberal and conservative.

1. **Liberal Style**: The individual with liberal style likes to go beyond existing rules and procedures, to maximize change and to seek situations that are somewhat ambiguous. The individual is not necessarily ‘politically’ liberal.
2. **Conservative Style**: The individual with conservative style likes to adhere to existing rules and procedures, minimize change, avoid ambiguous situations where possible and stick with familiar situations to work and professional life. The individual will be happiest in a structured and relatively predictable environment. When such structure does not exist, the individual may seek to create it.

1.1.2 **THE PRINCIPLES OF THINKING STYLES**

According to Sternberg (1997) there are 15 general points we need to understand about thinking styles. These are given below:

1. Styles are preferences in the use of abilities, not abilities themselves.

2. A match between styles and abilities creates a synergy that is more than the sum of its parts.

3. Life choices need to fit styles as well as abilities.

4. People have profiles (or patterns) of styles, not just a single style.

5. Styles are variable across tasks and situations.

6. People differ in the strength of their preferences.

7. People differ in their stylistic flexibility.

8. Styles are socialized.

9. Styles can vary across the life span.

10. Styles are measurable.

11. Styles are teachable.

12. Styles valued at one time may not be valued at another.

13. Styles valued in one place may not be valued in another.

14. Styles are not an average, good or bad - it’s a question of fit.

15. We confuse stylistic fit with levels of abilities.
1.1.3 DEVELOPMENT OF THINKING STYLES

(Variables in Stylistic Development)

According to Sternberg (1997) there are following variables which are likely to affect development of thinking styles:

1. Culture: First variable is the culture, which is likely to affect development of thinking styles. Some cultures are likely to be more rewarding of certain styles than of others. For example, the North American emphasis on innovation and making the "better mousetrap" may lead to relatively greater reward for the legislative and liberal styles, at least among adults. National Heroes of one kind or another in the United States, such as Edison as inventor, Einstein as scientist, Jefferson as political theorist, Steven Jobs as entrepreneur and Ernest Hemingway as author, tend often to be heroes by virtues of their legislative contribution.

Other societies, such as Japan, that traditionally more highly emphasize conformity and the following of tradition may be more likely to executive and conservative styles. Similarly, in some Cultures, children are taught from an early age not to question certain religious tenets or not to question the government. Such cultures reward a conservative style and to punish a liberal one. Some religious and ethnic groups encourage a legislative and liberal thinking style that is likely to produce creative work and to eventuate in, prizes for creative achievement. Other groups discourage such thinking styles. Although internal and external styles may be found in both kinds of cultures, the respective resources of the cultures suggest that internalism will be more highly valued by the individualistic culture, externalism by the collective culture.

2. Gender - A second variable that is potentially relevant to the development of styles is gender. In particular, males are more likely to be rewarded for a legislative, internal liberal style, females for an executive or judicial, external
and conservative style. The reason for this may be - males and females will be socialized in different ways, from the time they are born.

Sternberg (1997) holds that traditionally, a legislative, liberal pattern of styles has been more acceptable in males than in females. Men were supported to set rules and women to follow them. But this tradition is already changing in many cultures.

3. Age - The third variable is age, which affects the development of thinking styles. Legislativeness is generally encouraged in the preschool young, who are encouraged to develop their creative powers in the relatively unstructured and open environment of the preschool and some homes. Once the children start going to school, the period of legislative encouragement rapidly draws to close. Children are now expected to be socialized into largely conforming values of the school. The teacher now decides what the students should do and students do it, for the most part.

4. Parenting Style - A fourth variable is parenting styles which plays crucial role in the development of thinking styles of children. For example, a monarchic parent is likely to reward a child who shows the same single-mindedness, whereas an anarchic parent would likely abhor a child beginning to show a monarchic style and to try to suppress it as unacceptable. Parents who mediate the child in ways that point to a larger than smaller issues are more likely to encourage a global style, whereas who do not themselves generalize are more likely to encourage a more local styles of thinking. The ways in which parents react can influence the styles of thinking that their children develop. For instance, children are more likely to develop legislative styles if their parents encourage the children to ask questions and where possible, to seek answers for themselves; children are more likely to develop judicial style if their parents encourage the children to be evaluative, to compare and contrast,
to analyze, to judge things both with respect to the question the children ask and with respect to the answers that are given.

5. **Schooling** - One variable affecting the development of thinking style is kind of schooling. Different schools reward different styles of thinking. On the average, schools in most parts of the world are probably most rewarding of the executive, local and conservative styles of thinking. Schools see themselves as socializing agent. Intellectual independence is encouraged when the student reaches advanced graduate level. Even there, legislatively thinking is often not encouraged.

6. **Occupations** - Occupation also reward different thinking styles of children. An entrepreneur is likely to be rewarded for different styles than is an assembly - line worker. As individuals respond to the reward system of their chosen life pursuit, various aspects of style are more likely to be either encouraged or suppressed.

7. **Socio-Economic Status** - Socio-economic status is likely to affect the development of thinking styles. It is supposed that socio-economic status is negatively related to the judicial, local, conservative and oligarchic styles of children. Greater authoritarianism in the styles is seen of children of low socio-economic status.

**1.1.4 EDUCATIONAL IMPORTANCE OF THINKING STYLES**

The potential contributions of thinking styles to education may be described under following main rubrics:

1. **Improving Instructional Methods:**

Thinking styles might provide a basis for tailoring the mode of presentation as well as the nature and degree of substantive structure to functional characteristics of learners, so as to develop, compensate for, or capitalize upon student characteristics for the optimization of subject
matter learning. Contrariwise, depending on the educational goals, students might be deliberately confronted with instructional demands that are congenial to their thinking styles so as to stimulate growth and flexibility. There is thus a continuing, but potentially fruitful, tension over the relative value of matching educational treatments to learner characteristics as opposed to mismatching them. Although matching may be facilitative when the aim is to enhance immediate subject-matter achievement, mismatching may be needed when the aim is to promote flexible and creative thinking - obstacles, opposition, conflict and challenge may be necessary to stimulate individual development and creativity. Depending upon the instructional aims, curriculum materials and procedure might be devised in stylistic terms - by varying the degree of independent study versus group instruction, cognitive controls and stylistic abilities might thus serve to increase functional options for individualization of instruction.

2. Enriching Teacher Behaviour and Conceptions:

Teacher performance might be improved through heightened awareness of thinking styles, which could lead to increased flexibility in the teacher's own stylistic preference for particular evaluation and teaching methods. Increased teacher awareness of stylistic differences might also improve teacher-student communication by increasing sensitivity to verbal and non-verbal stylistic cues and to the communicative difficulties attendant upon stylistic mismatch. Teachers and students who are similar in thinking styles tend to view each other with greater mutual esteem than do those who are dissimilar; they also tend to communicate more effectively, as if they were on the same wavelength. If teachers and students were more aware of stylistic differences, these match-mismatch effects be considerably attenuated through resulting improved communication.
3. Enhancing Student Learning and Thinking Strategies:

By increasing student awareness of thinking styles and their implications for learning, communication and social functioning, the teacher might expand student purviews about the range of alternative thinking strategies that are congenial to their styles but those that are uncongenial as well. Since strategies may be more easily learned than styles and more amenable to alteration, teacher might thereby increase the student’s strategic repertoire and the likelihood that strategies, even stylistically uncongenial ones, will be selectively and appropriately applied as a function of varied task requirement.

4. Expanding Guidance and Vocational Decision-Making:

Since thinking styles are related to vocational preferences and to choice of major field as well as to choice of specialization and to relative performance within fields, knowledge of students, thinking styles should contribute to improved educational decision-making. Moreover, since thinking styles have implications for the ways in which information is selected, processed and used, styles should be taken into account in optimizing student’s involvement in the guidance process.

5. Broadening Educational Goals and Outcomes:

The pervasiveness of thinking styles suggests that capitalizing upon styles and coping with their restrictiveness might become explicit goals of education—that schools and colleges should be concerned not just with knowledge acquisition but also with the student’s manner of thinking. The concern invokes a number of process goals and associated process outcomes to be evaluated, such as the development of strategic thinking, the enrichment of the student’s repertoire of procedural alternatives, and the development of flexibility the utilization of multiple thinking modes.
6. Tuning the Stylistic Demands of Learning Environment:

Educational environments make stylistic demands as well as intellective demands, but the stylistic demands of most current programmes and settings are usually so intermixed that they neither uniformly match nor uniformly mismatch learner styles. Rather, they are generally misaligned with stylistic characteristics of learners, with some environmental and program features facilitating and others debilitating performance. This often puts students in a double bind. (Chickering, 1976)

From a thinking style perspective, we are in a position to explore the stylistic requirements of different learning environments with a view toward developing style-consistent modules of instructional method. Such modules might include suitable teaching methods. Such explorations may help us better understand and appreciate the subtle stylistic demands of the conditions of learning.

7. Render Help in Adopting Suitable Assessment Methods:

It is assumed that different methods of assessment tend to benefit different thinking styles. For instance, multiple-choice testing is very much oriented toward executive and local thinkers. Similarly, short answer type tests are most compatible to executive, local, hierarchical and internal thinking. Essay tests do not benefit particular styles, perse. Rather, whom they benefit depends on how the essays are evaluated. Projects and portfolios tend to reward styles that are quite different from those typically rewarded by short-answer and multiple-choice tests. Even interviews tend to reward some styles over others. Therefore, there is a need to correspondence between thinking styles and different formats of tests. Having complete knowledge of testing and thinking styles, the teacher is in best position to adopt suitable methods of assessment in the classroom.
Thus, it may be noted instructor can facilitate learner’s use of thinking styles information for helping them to understand as thinkers, for encouraging them to expand their thinking styles, for using a variety of learning approaches, for creating an environment in which diversity can thrive; for creating a climate in which collaboration exists and for preparing them to be tested according to different styles of thinking. Apart from teacher and learner, curriculum designers and educational administrators may also be benefited from the knowledge of thinking styles in various ways.

1.1.5 CONCEPT OF PERSONALITY

Personality is an arbitrary term to be defined in boundaries. The term personality has been derived from a Latin word ‘Persona’ which means a mask that the Greek actors commonly used for acting. Personality means the effect, which an individual leaves on other people.

Personality has been described differently by various psychologists. Psychologists define personality as

- A stimulus
- Summative approach
- Integrative approach
- Totality view
- As a factor of adjustment

Personality can thus be assessed as a stable system of complex characteristics by which the life pattern of an individual may be identified. The creative energies of the future therefore must be at least partially directed towards the problems that accompany the development of increased potential for harm.

According to Torrance (1965), it becomes absolutely necessary that serious attempts must be made to ensure the development of creative development.
Torrance (1969) says that deplorable waste of human talents is to be prevented and if creatively gifted students are not to use the paths of delinquency, mental illness or at least the life of mediocrity and unrealized potentialities.

According to Parnes (1971), society’s mental health can be described as the difference between the potential and actual civilization of every person in the population.

The term personality has no single standard definition. The social scientists who formulated the definition kept in view one of the three things about a person

(i) His external appearance and behaviour or social stimulus value,

(ii) His awareness of self as a permanent organizing force,

(iii) His particular pattern or organization of measurable traits both inner and outer ones.

**Personality as a Social Value : Ruch (1967)** says that an individual’s social stimulus value is the effect he has upon others. It is determined by all those characteristics and qualities of the individual that act as a stimuli for other people.

**Personality as a Self-hood : Ruch (1967)** says that certain psychologists emphasize that for early childhood, the individual’s concept of self is an important factor in guiding both his immediate behaviour and the further development of his personality.

**Personality as a complex of Interacting Traits** : Another approach to personality is to study the measurable traits of the individual. Traits are defined as characteristics that can be observed and tested objectively or inferred from observable and measurable behaviour. These are often
called as dimensions of personality, because they can be measured as quantitative continuum.

It has been found that no definition is completely satisfying.

**Allport’s (1961)** definition is widely accepted which defines personality as the dynamic organization within the individual of those psycho-physical systems that determine his characteristics, behaviour and thought.

**Cattell (1952)** observed that, ‘It is a truism the most human affairs, political, social, commercial, cultural, domestic-hinge on issues of personality’.

**Richard Sochacht (1971)** has shown that a distinctive personality is not simply a lofty ideas but amounts to an existential imperative.

**Sochacht (1971)** says that “A person is not as he should be to the extent he fails to develop a distinctive personality.”

One way to proceed is to work for the release of creative analysis, which will make such inventions possible. Through bringing creative energies to bear on the activities of everyday existence, the reintegration of the fragmented self into a meaningful, distinctive personality becomes a real possibility.

The three basic dimensions (defined as clusters or groups of correlated traits) derived by **Eysenck** through his work are:

1. Introversion Extroversion
2. Neuroticism (emotional instability — emotional stability)
3. Psychoticism

The three basic dimensions refer to definite personality type i.e. introvert, extrovert, neurotic, stable, high psychotic and low Psychotic. However, the term ‘type’ as applied by Eysenck stands clearly for a
dimension along a scale with a low end and high end for putting people at various points between the two extremes. While the high end on the first dimension introversion-extroversion includes the highly extrovert recognized as sociable, outgoing, impulsive, optimistic and jolly people the lower end typifies the highly introvert recognized as quiet, introspective, reserved, reflect, disciplined and well ordered people. Eysenck believed that purely extrovert or purely introvert people were rarely found and he, therefore preferred to use a dimension, i.e. a continuum ranging from introversion to extroversion instead of naming types as introverts and extroverts.

The second major dimension suggested by Eysenck involves emotional instability at the lower end and emotional stability at the upper end-describing people as neurotic and not neurotic (i.e. stable). Thus, at its lower end are the persons who are moody, touchy, anxious or restless, at the upper end are the persons who are stable, calm, carefree, even-tempered and dependable.

The third dimension is psychoticism. The people high on this dimension tend to be solitary, insensitive, egocentric, impersonal, impulsive and opposed to accepted social norms while those scoring low are found to be more empathic and less adventurous and bold. However, Maudsley Personality Inventory was developed based on two dimensions i.e. Extroversion and Neuroticism.

1.1.6 EDUCATIONAL IMPORTANCE OF PERSONALITY

Eysenck’s most recently test of personality (EPQ, 1975) measures neuroticism-stability, extroversion-introversion, and high Psychoticism low psychoticism. Cattell’s tests on the other hand measures up to 16 traits or factors, though he accepts that some of these interrelate and may be related to underlying source traits similar to those of Eysenck.
A number of studies have attempted to show a relationship between Eysenck’s or Cattell’s tests and educational attainment but results have been disappointing and variable. There is, for example, some link between extroversion and success at primary school level, and some link between neuroticism and certain kinds of success and failure in higher education, but the correlations are small and somewhat localized. This doesn’t mean however, that the dimensions isolated by Eysenck and Cattell have little relevance for education.

It means simply that the relationship between them and academic success and failure in highly complex and difficult to measure by current research methodology. The teacher’s own personality, for example, enters crucially into equation. Thus extroverted children may perhaps do significantly better than introverted children in the primary school, provided their teacher is also extroverted. And neurotic children may get by quite happy provided their teacher is sensitive to their problems.

Teaching materials and teaching methods will come also into it. Arts subjects could be more suitable for introverts and science subjects for extroverts may be, though a lot will depend upon the particular approach of the teachers or lecturers concerned and the kind of study habits they demand from their students. Age and ability levels also affect the demand upon teacher.

Classroom interactions, complexity has different kind of relation with personality effect upon student’s achievement. Student personality is not only related to achievement but also the ways they think, they solve problem and learn.

Teacher’s personality also plays a significant role in teaching-learning process. There is no doubt that good teacher have certain identifiable features of personality such as out going/extroverted, well
balanced/stability etc. Teacher personality also not only affects the achievement of the students, their attitude toward learning but also their ways of learning and thinking. Several empirical studies have extended the support to it.

A number of studies have shown that extroverts are more field-independent than introverts on a number of measures of the phenomenon (Loo, 1976, Fine and Dan Forth, 1975). There seems to be little consistent difference between neurotic and stable subjects with respect to field-dependence. Arora and Murthy (1975) found that clinical neurotic subject was more field-dependent than normal. This clearly supports the view that thinking style may also have relationship with personality type.

Thus we find that students and teacher personality undoubtedly plays a significant role in education.

1.1.7 CONCEPT OF MOTIVATION

Behaviourists explain learning in terms of stimuli in the environment and responses made by the individual. Cognitive psychologists concern themselves with individual’s perceptions of the world, while motivation theorists emphasize the connection between behaviour and needs, drives, goals and motives.

A basic assumption in motivation theory is that people behave as they, do to reduce their needs. A need is a requirement that must be met for optional adjustment to the environment. There are several kinds of needs. Certain needs such as food and water are necessary to survive. Because of their essential nature, they are called primary needs. Similarly there are secondary and tertiary needs, which are essential to physical survival but their fulfillment does make a positive significant contribution towards our adjustment.
Motivation is concerned with the energizing and directing of behavior, by its vary nature, is energized and directed even at the most primitive levels.

H.W. Bernard has defined motivation as “Motivation refers to all those phenomena which are involved in the stimulation of action towards particular objectives where previously there was little or no movement towards those goals”.

Atkinson defined motivation as “The term motivation refers to the arousal of tendency to act to produce one or more effects.”

Thus by motivation, we usually think of what is that prompts or causes a person to act. In scientific terms, motivation is an “energizing condition of an organism that serves to direct the organism’s behaviour, usually a goal or goals of certain class”.

Motivation thus includes both energy (drive) and direction (learned ways to satisfy our needs). Human motivation is a complex process. The drive may be intrinsic or internal or extrinsic viz. external. It implies that based on the type of drive, motivation can be classified into two types:

1. Intrinsic motivation
2. Extrinsic motivation.

INTRINSIC MOTIVATION

“Motivation” is an umbrella term having a wide variety of connotations and denotations. On the one hand, the classroom teacher sees motivation as the characteristic that makes the good” student learn; the “lazy” student is said by the teacher to be unmotivated. On the other hand, the psychologist gives motivation a much broader meaning; it refers to the process involved in the arousing, directing and sustaining of behaviour.

When we see people engaged in action to display competency or exercise control over what is happening, we infer they are intrinsically
motivated. (Deci, 1975; Kukla 1978; Notz, 1975). Intrinsic motivation is what a learner brings into the learning situation. De Charms (1971) believes that a person’s primary motivation is to produce change in the environment. The more internally controlled a person is, the more intrinsically satisfying external events are. Intrinsic motivation depends upon factors hinging on unharmonious or dissonant relations within the learning process, for example the notion of perceptual conflict or cognitive imbalance. Reward in this process is closely related to the thought process involved. Satisfaction in solving a problem or restoring a conflict is rewarding the learner. Berylene (1960, 1963) while discussing intrinsic motivation introduced the term ‘epistemic curiosity’ to refer to knowledge seeking behaviour including questioning, observation, problem solving. Epistemic curiosity then is concerned with pursuing knowledge for its own sake rather than for any reward extraneous to it. Mc.V. Hunt (1971) in a discussion of intrinsic motivation in young children, attaches great importance to complexity in relation to children’s interest and curiosity.

Knowledgeable enthusiasts, whether children or adults, are those who become committed to an interest for its own sake and once committed there is an even stronger tendency to remain involved.

Hunt (1960) maintains that if activity is intrinsic in living organism. It is not necessary to see all behaviour as a matter of either reducing or avoiding stimulation.

Hunt (1964) suggests that incongruity may serve as motivation. He writes, “The temperature at which the thermostat is set supplies a standard against which the temperature of the room is continuously being tested.”

The Dictionary of Behavioural Sciences

The Dictionary of Behavioural Sciences defines ‘Intrinsic Motivation’ as an incentive, which originates wits’ in the behaviour rather than externally (Wolman, 1973, p. 243). According to White (1959) and
Bruner (1966), one is intrinsically motivated to perform an activity when he receives no apparent reward except the activity itself. Dcci (1978) holds that intrinsic motivation obtains whenever actor locates causality for his activity with in himself. Misra (1989) also states that a person is considered as intrinsically motivated if he performs an activity for his own sake.

Taking a broader perspective of intrinsic motivation Csikszentmihalyi (1978) has conducted that a considerable proportion of behaviour involves goals and rewards that arise out of direct involvement with the ongoing activity these goals may be called sources of emergent motivation. However, deriving motivation from interactions with tasks requires that a situation should provide information to the person that his or her actions are meeting a set of challenges in the environment. Also this system of motivation requires development of skills to utilize a larger number of channels of information in varied contexts.

Another approach to intrinsic motivation considers it as an individual disposition having cross-situational generality. According to Haywood (1971), people vary in likelihood to be motivated by the task intrinsic or task extrinsic characteristics. This view implies existence of individual differences in the disposition to respond differently to incentives, which can be specified as task intrinsic or task extrinsic.

Thus, it is obvious that intrinsic motivation have been approached from divergent viewpoints. It has been treated as individual’s preference from an activity without any external reward, as an emergent motivation and as an enduring disposition with cross-situational generality to be motivated by within-task-factors.

Certainly there is a correlation among the learner’s capacity for incongruity the information he or she possess, past success as a learner and so on, but the extent of this correlation remain to be determined by future research. At present, it seems accurate to state that for most learners too wide a gap will be frustrating and too small a gap will be boring.
EXTRINSIC MOTIVATION

An individual’s values are subjective determinants of his motivational process. Though a value is related to an interest, it is not quite the same. A value somewhat like an ideal emphasizes a way of life. It is a perceptive set in one’s behavioural pattern.

In relation to the determinants, motivation is spoken of as primary (intrinsic) or secondary (extrinsic). You do something because you enjoy the process of doing it, your motive is primary or intrinsic one. If your goal is the direct accomplishment of your motive, it is a primary or intrinsic reward.

Extrinsic motivation inheres when the source of reward or punishment lies external to the individual and in the control of other people who determine the appropriateness of the behaviour of the individual. People are motivated to maximize satisfaction and minimize dissatisfaction; when they obtain satisfaction from other, those others became agents of control.

Deci (1978) holds that extrinsic motivation obtains whenever the actor locates causality in the external environment. It is always directed towards the rewards for which the activity is only instrumental.

It is apparent that for Maslow, the goal of learning is a “human goal, the humanistic goal, the goal so far as human beings are concerned— is ultimately the self actualization’ of a person, the becoming fully human, the development of the fullest height that the human species can stand up to or that a particular individual can come to.” That is to say, it is learning to be the best person that one is capable of becoming. It is learning to grow toward full self-actualization or toward full humanness; the realization of one’s profoundest humanity. Intrinsic learning is learning that fructifies in self-actualization or growing to full humanness.
Extrinsic learning on the other hand is the process that is essentially external rather than internal. It is characteristics of the behaviour-learning theorists who exposed the stimulus response theories of learning.

According to Mishra (1989) a person is considered extrinsically motivated if the activity is performed to an end i.e. to obtain a reward or to avoid punishment.

Extrinsic learning as argued by Maslow, is learning from the outside, learning of the impersonal or arbitrary, associations; of arbitrary conditioning, i.e. of arbitrary meaning and responses. In this kind of learning, most often it is not the person himself who decides, but rather a teacher or an experimenter who says, ‘I will use the buzzer”, “I will use the bell”, “I will use a red light” and most important, I will reinforce this but not that.” In this sense the learning is extrinsic to the learner. extrinsic to the personality and is extrinsic also in the sense of collecting associations, conditionings, habits or modes of action.

1.1.8 EDUCATIONAL IMPORTANCE OF INTRINSIC AND EXTRINSIC MOTIVATION

Motivation is a very complex phenomenon, which is influenced by multiple variables operating within the organism and in the environment. The various factors, which influence motivation, are - psychological, emotions, habit, mental sets, values and attitudes. In addition to these factors, the environmental factors and incentive also play a vital role in the process of motivation.

At normal levels, tension is highly beneficial from the standpoint of the individual’s maximum self-realization for, without this powerful force impelling him to regain equilibrium through the satisfaction of his need, he would remain forever childish, ignorant and incompetent.
Both intrinsic and extrinsic stimuli are involved in the motivation of behaviour. The intrinsic stimuli arouse the individual to activity and sensitize him to certain aspects of his environment while stimuli arouse and promote need-seeking behaviour. Motivated behaviour is frequently triggered more by extrinsic stimuli than by internal needs.

The determinants of human behaviour - whether called needs, drives, motives or purposes are generally encompassed under the broad heading of motivation which has, therefore at least two fundamental components: a need state and an external goal. Motivation thus may be defined as a state of the organism in which its energies are mobilized selectively toward the attainment of a given goal: More specifically, motives serve three important functions:

1. They energize, i.e. they activate and sensitize the organism toward certain stimuli.
2. They direct the behaviour toward certain goals and
3. They reinforce the behaviour i.e. effective in the attainment of derived goals.

Motivation, thus, plays a key role in learning process. Studies have shown that higher level of motivation is found in high achievers as compared to low achievers. In other words, high level of motivation for learning facilitates academic attainment of the learners even after controlling the ability of learner, motivation has found to increase the academic level of the students. Intrinsic motivation has close link with deep studying and extrinsic motivation with surface studying. In number of studies of styles (cognitive and learning) motivation has been observed an important factor.

Motivation is not only of paramount significance for learners; it is also of considerable importance for teachers. Teacher’s motivation to work
is an essential component of teacher effectiveness and efficiency, which in turn does influence learning outcomes and personality of the learners.

Hence, motivation has much educational value as Richardson (2000) states that academic progress may depend at least as much upon the motivational aspects of learning.

1.2 STATEMENT OF THE PROBLEM

In the past several years, there has been extensive research on various approaches to college teaching. But no one approach or method has been found to be consistently superior to all others. However that may only be showing that no one approach is superior for the mythical average students. The more important question is to determine which student learn best under what conditions. An emerging area of research that holds promise in helping us answer this question is student’s styles of learning and thinking.

It is amply evident from the foregoing presentations that the research area of styles of thinking is new one particularly for Indian researchers. There are several variables, which need to be investigated in relation to thinking styles of college students. Significant among them are academic achievement, gender, academic discipline/stream, motivation and personality type. The proposed study has been designed to address the following research question –

i. Are there significant differences in styles of thinking of college students having varying levels of academic achievement. i.e. high, average and low?

ii. Are there significant gender differences in the styles of thinking of college students?

iii. Do college students belonging to science, arts and commerce streams exhibit significant differences in their styles of thinking?
iv. Do significant differences exist in styles of thinking of college students having different types of personality?

v. Do college students with high and low levels of Intrinsic’ and ‘Extrinsic’ motivations show significant differences in their styles of thinking?

The above research questions are the integral part of the research problem. Thus the problem of the study was stated as follows:

“A STUDY OF THINKING STYLES OF COLLEGE STUDENTS IN RELATION TO SELECTED COGNITIVE AND NON-COGNITIVE FACTORS”

1.3 NEED AND JUSTIFICATION OF THE STUDY

Educators hold that students learn and think in unique individualized ways whether they belong to school, college or university level. Post-secondary education or higher education is becoming increasingly important in every society of developed or developing countries. Particularly a society of people who make mid life career changes or advance their skills or who must work out of necessity or those whose leisure time permit higher education, all contribute to increase demand of higher education through formal or non-formal modes. Therefore the question of how to teach college level students in more effective and efficient ways is becoming pertinent day-by-day.

In search of solution of teaching problems college students, some work has been done on thinking styles of students in foreign countries. But in India no such attempt has been made so far. Hence there is a considerable scope to probe the area styles of thinking of college students in socio-cultural milieu of Indian society.

Thinking styles are very important components of the learning processes of college education. Their understanding is highly desirable if we have to obtain a comprehensive picture of learning processes of
college students and to base our teaching efforts on the knowledge of the same in order to inject quality control in educational process.

In view of the above, the need of the proposed study is vividly clear and the study was quite justified to undertake.

1.4 OBJECTIVES

The following objectives were realized in the proposed study –

1. To find out the differences in thinking styles of college students in relation to their academic achievement.

2. To Study the differences in thinking styles of college students in relation to their gender.

3. To Study the differences in thinking styles of college students belonging to science, arts and commerce streams.

4. To find out the differences in thinking styles of college students in relation to their personality types.

5. To find out the differences in thinking styles of college students in relation to their motivational orientations.

1.5 HYPOTHESES

The following hypotheses have been tested in the proposed study:

1. There will be significant differences in thinking styles of college students having high, average and low levels of academic achievement.

2. There will be significant differences in thinking styles of male and female college students.

3. There will be significant differences in thinking styles of college students belonging to science, arts and commerce streams.

4. There will be significant differences in thinking styles of college students having:

   (a) extrovert type and introvert type personality and

   (b) neurotic type and stable type personality.
Theoretical Orientation

5. There will be significant differences in thinking styles of college students having high and low levels of motivational orientations Viz.
   (a) high and low levels of intrinsic motivation and
   (b) high and low levels of extrinsic motivation.

However, for the sake of convenience of testing each hypothesis was into specific hypotheses based on thinking styles.

1.6 SCOPE AND DELIMITATIONS

Scope and delimitations of the present study may be understood in terms of the objectives, hypotheses, research method, population sampling, variables, tools, and statistical technique etc.

> The study was delimited in terms of its objectives. These objectives were concerned with determining the differences in thinking styles in relation to college student’s cognitive and non-cognitive factors.

> Cognitive factors was academic achievement and non cognitive factors were gender, stream, personality type and motivational orientation.

> The study was concerned with testing of non-directional research hypotheses.

> The study was carried out through descriptive methods of research.

> The population of the study comprised college students of final year studying in science, arts and commerce streams.

> The sample was drawn from the colleges of Jhansi only. It included both - govt. managed and privately managed institutions. The sample included subjects of both sexes.

> Institutions were, selected through random method but the sample was drawn through random cluster sampling technique.
The study was further delimited in terms of variables. Academic achievement, gender, stream, personality type and motivational orientation (intrinsic and extrinsic) were regarded Independent variables. Thinking styles were treated as Criterion variables.

The data were collected with the help of Torrance et.al’s SOLAT, Sternberg et.al’s Thinking Style Inventory, Eysenck’s MPI and Ambile et al’s Work Preference Inventory. Academic Achievements marks were noted from gazette.

Subjects were classified by using $M \pm 1$ SD formula on academic achievement, personality type (Extraversion and Neuroticism) and motivation orientation (Intrinsic and Extrinsic).

The data on criterion variables were analyzed by ‘t’ test and one-way Analysis of variance technique. Post-hoc analysis was done again by ‘t’ test. Graphs were used to depict differences in mean scores of thinking styles in respect of various groups.

The study was delimited in terms of time and financial resources also.

1.7 DEFINITION OF THE KEY TERMS USED

The key terms which have been used frequently in the present study have been defined here to bring precision and clarity:

THINKING STYLE: Refers the way one thinks or prefers to think using particular cerebral hemisphere or mental ability.

- Left Hemispheric Style: Refers to inclination to use the left cerebral hemisphere in information processing.

- Right Hemispheric Style: Refers to inclination to use the right cerebral hemisphere in information processing.

- Integrative Style: Refers to inclination to make use of capabilities of both cerebral hemispheres in information processing.
Theoretical Orientation

- **Legislative Style**: Person with this style is concerned with creating, formulating imaging and planning; likes to formulate his/her own activities.

- **Executive Style**: Person with this style is concerned with implementing and doing, likes to pursue activities structured by others.

- **Judicial Style**: Person with this style is concerned judging, evaluating and comparing; likes to judge the products of others activities, or to judge the others themselves.

- **Monarchic Style**: Person with this style tends to focus single-mindedly on one goal or need at a time, a single goal or way of doing things predominates.

- **Hierarchic Style**: Person tends to allow for multiple goals, each of which may have a different priority; knows how to perform multiple asks within the same time frame, setting priorities for getting them done.

- **Oligarchic Style**: Person with this style tends to allow for multiple all of which are equally important; likes to do multiple tasks the same time frame but has difficulty setting priorities for them done.

- **Anarchic Style**: Person with this style tends to eschew rules, procedures and formal systems; often has difficulty adjusting to school as a system.

- **Global Style**: Person with this style prefers to deal with the large picture and abstractions.

- **Local Style**: Person with this style prefers to deal with details and issues.

- **Liberal Style**: Person with this style likes to do things in new ways, to have change in his/her life, and to defy conventions.

- **Conservative Style**: Person with this style likes traditions and stability; prefers doing things in tried and true ways.
PERSONALITY TYPE: Refers to type of personality based on two dimensions as measured by MPI of Eysenck e.g. extroversive and introversive, neurotic and stable types.

- **Extrovert (Extroversive) Type**: Refers to type of personality which is least centered around shyness and withdrawal and is more social
- **Introvert (Introversive) Type**: Refers to type of personality which is shyness and withdrawal centered.

- **Neurotic Type**: Refers to the general emotional liability of a person, his emotional over responsiveness and his liability to neurotic breakdown under stress.

- **Stable Type**: Refers to neurotic stability under stress.

MOTIVATION ORIENTATION: Refers to preference for intrinsic and extrinsic motivation as measured by Student Work Preference Inventory of Amabile et al.

NON-COGNITIVE FACTORS: Refers to academic achievement of students.

NON-COGNITIVE FACTORS: Refers to gender stream, personality type and motivational orientation.