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CHAPTER - 1

Introduction

The Education Commission (1964-66) observes "The Destiny of India is now being shaped in her class-rooms. In a world based on Science and Technology, it is education that determines the level of prosperity, welfare and security of the people. The quality and number of persons coming out from our schools and colleges will depend our success in the great enterprise of national reconstruction whose principal objective is to raise the standard of living of our people." So it is the function of the school to produce individuals possessing qualities of the mind and heart. Further, the Education Commission (1964-66) observes "In a democracy an individual must form his own independent and political issues and to a large extent, decide his own course of action. In one form or another, there is a world-wide trend which shows great concern about creativity (Divergent thinking). Advanced countries are definitely
interested in the study and development of creativity, as are Third world countries, whose survival depends upon the creative vision and creative striving of masses". In our society many old traditions have given place to new ones. We welcome newness in certain walks of life. Unfortunately, we seldom look for such a newness in our education and in our teaching-learning process. Innovative teaching and learning strategies as well as the new ways and means of providing conducive environment in schools, homes and community as a whole is an inevitable things for nurturing divergent thinking in children from the early age itself. Thinking is essentially a human phenomenon. It is a process in man which helps him achieve dignity and meaning in life. Especially Divergent thinking is considered to be identical with the expansion of the universe and the main task of man on this planet. Man's effort, at its best, has revealed itself in his creative work and in his search for a type of cosmology which defined his destiny. Whether it is considered from the viewpoint of its effects on society, or as one of the expressions of the human spirit, creativity (divergent thinking) stands out as an activity to be studied, cherished and cultivated.

1.1 Divergent Thinking and Convergent Thinking: Concept and Meaning

The world's achievements in every period are shaped by the thinking abilities of talented persons. The milestones of human history were installed by innovative achievements in the past. Not only the material advancement but also the progress in art and literature, scientific discoveries and evolution of dynamic, social and political orders have been the contribution of innovative persons. Thinking is an operating skill through which intelligence acts upon experience and
knowledge or information is the basic material handled by thinking. Tomorrow need is not masses of educated men but men educated to feel and to act as well as to think and to create." These two verbative words: to think and to create, would indicate the process of creative thinking, that is to think creatively for today and tomorrow.

The power of thinking is an extraordinary ability acquired by human beings. In contrast to the animals, man is considered to be endowed with certain cognitive abilities, which make him a rational being. He can reason, discriminate, understand, adjust to and face the new situations. According to psychological Dictionary (1987) 'thinking' is a cognitive process of an individual characterised by a generalised and mediated reflection of reality.

Thinking constitutes different types of thought processes. The important thoughts are abstraction, generalisation, symbolisation, manipulation of symbols and the construction of schemes (K.P.Diene's, 1966). As per these ideas, mathematicians identified eleven types of thinking abilities in problem solving. They are (a) Formation of concepts, (b) Manipulation of imagery, (c) reflective thinking, (d) manipulation of symbols, (e) principle of reversibility, (f) understanding structure, (g) inductive reasoning, (h) deductive reasoning, (i) analysis, (j) synthesis and (k) divergent thinking. These eleven types of thinking abilities in mathematics are not exclusive. Sometimes, they may occur simultaneously or overlap or include others. Most of these abilities are used in problem solving situations. They may also be broadly classified as involving Convergent and Divergent Thinking abilities.
The concepts of Divergent thinking and Convergent thinking have come to be understood in clear perspective as a result of researches conducted by Guilford (1959 and 1967). According to Guilford’s structure of Intellect (SI) model, human abilities can be classified into three categories - (1) the operation, (2) the content and (3) the product. The term 'operation' refers to basic psychological processes involved, that is, cognition, memory, convergent thinking, divergent thinking and evaluation. The term 'content' refers to the kinds of material employed that is, figural, symbolic, semantic and behavioural. The product refers to the fundamental kinds of products that may ensure a result of combinations of operation and content. The model thus conceived, delineates the whole range of human abilities of particular interest. There are two modes of intellectual operation, namely, convergent thinking and divergent thinking, identified by the SI theory.

Convergent thinking refers to the conventional type of intelligence emphasising the narrowing down of possibilities on the production of the alternative answers to a problem. Further, convergent thinking refers to the generation of ideas arising from the given information with emphasises on achieving conventionally acceptable answers. In other words, in convergent thinking, the emphasis centers on logical necessities.

On the other hand, Divergent Thinking is viewed as involving the production of as many answers as possible to a problem. It is concerned with thinking in different directions, sometimes searching, sometimes seeking variety. In other words, in divergent thinking, the emphasis centers on the logical possibilities. Thus, divergent thinking comprises a relatively distinct group which stands apart from the conventional concept of general intelligence.
In measuring Divergent thinking, dimensions, namely fluency, flexibility and originality are used and the sum total of the scores in three dimensions is taken as a measure of divergent thinking (Jayalakshmi, 1984). Fluency refers to the total number of correct responses. Flexibility refers to the number of different categories of responses. Originality refers to the extent to which students produce responses that are statistically unusual.

The Encyclopedia of Education (1971) describes these dimensions as follows. "Fluency is defined as facility in retrieving information from the brain's memory store". To make a test of fluency meaningful, every individual should have the same supply of information in his memory store. The experimenter can approach this condition by giving a test problem calling for information that everyone tested. The test for an ability called ideational fluency asks the subject to list all the things he can think of that are, for instance, white and edible. The subject may reply bread flour, sugar, snow, milk, salt, whipped cream. The score is the total number of responses produced in specified time.

The task in an ideational fluency test resembles the very common effort to recall information which satisfies class specification (white and edible in this case). In problem solving the individuals 'search model' provides the class specifications. A second type of fluency - associational fluency - is the ability to recall ideas which satisfy a certain relation. If asked for words that mean almost the opposite of soft, the subjects may reply, hard, difficult, tough, unyielding, rigid and so on. Associational fluency characterises thinking by analogy. The third kind of fluency is expressional fluency, the production of alternate organised
thoughts. It has been called expressional fluency because it was first found in a
test that calls for the production of sentences, which represent a thought system.

One kind of flexibility is readiness to reclassify information. Given
a set of words, can the subject group and regroup them meaningfully in several
ways? Another kind of flexibility is the ability to revise meaning. For instance,
in the consequences test some subjects can suggest several remote and otherwise
unusual consequences. The third kind of flexibility involves changes in uses of
familiar objects or parts of objects such as using a wire from a guitar for slicing
cheese.

J.P. Guilford (1959) describes originality in the following words.
Originality is indicated by the scores of some tests in which the keyed responses
are weighted in proportion to their frequency of occurrence in the population
of examinees. Unusualness of responses in a statistical sense, is one principle of
measurement of originality.

The factor is also indicated by tests in which items call for Remote
Associations, remote either in time or in a logical sense. If we ask the examinee
to list all the consequences they can think of in the event that a new discovery
makes editing unnecessary, the number of remote consequences they give
indicates originality where the number of obvious consequences indicates
ideational fluency.

Another way of indicating degree of originality in taking tests is the
number of responses an examinee can give that are judged as being clever. The
titles given for short story plots, for example, can be rated as clever responses.
It indicates ideational fluency whereas the number of clever responses,
indicates originality.
1.2. Importance of Divergent Thinking and Convergent Thinking

Today's children are living in a dynamic and everchanging society. It is natural that one can expect education to meet the changing needs of the society. In other words, education should inculcate the abilities in the individuals to quickly comprehend and adjust to new situations and meet the challenges of life with confidence.

This adjustment ability involves a lot of divergent thinking. Further, society will present complex problems like population control, and the eradication of unemployment and social evils. These problems must be solved by themselves. Problem solving involves divergent and convergent thinking abilities. Hence, children possessing these two thinking abilities are assets to the society. Schools are the opt places where cultivation of these types of thinking abilities could be developed among children. In this line, convergent thinking and divergent thinking are of immense use in solving most of the problems in society.

Most of the personality characteristics have been correlated on Divergent thinking. John Parry and William Adisshaiah (1969), remarked that creatively thinking persons were receptive to new ideas and were adventurous. Torrance E.P. (1969) said that the highly creative children were rated higher on strength of self-image, ease of early recall, humours, availability of oedipal anxiety and uneven ego development. They were more sensitive and more independent than less creative children. Further, Torrance remarked that highly creative children had wild and silly ideas. Their work was characterised by production of ideas and off the beaten track outside the mould. They also did not fare too well on the traditional intelligence tests. Getzels and Jackson (1967) found that highly creative students were humorous, playful and receptive to new
experiences. They were not bothered by the assessment of others regarding their products. They had their own standards and were more concerned to meet them.

In the choice of occupations, the highly creative children choose vocations which were unusual and which provided scope for creative talent. The highly intelligent students choose traditionally respectable occupations like Doctors, Lawyers and Engineers.

1.3 Factors Influencing the Convergent Thinking and Divergent Thinking among Children

A number of Factors have been identified in recent years reflecting the influence on Convergent thinking and Divergent thinking. In general, these factors have been classified as background or demographic variables, psychological variables and organizational variables.

Background Variables

The background variables undertaken are sex, birth order, socio-economic status and size of the family. Children from Mars (1971) observed significantly high creative thinking scores in favour of males over females in nine scores out of thirteen drawn from the battery of Torrance Tests of Creative Thinking. Further, the studies conducted by Strauss and Strauss (1968), Kelly (1965), Dhir (1973), Guilford (1964), Hurlow (1967) and Middents (1968) on sex difference in creative thinking found that boys were observed to evince significantly more creative thinking than girls.

Birth order and creative thinking ability have each spawned a considerable body of research, but there have been relatively few attempts to investigate the relationship between these two. Many investigators have
assumed that it is reasonable to expect and to find a relationship between a particular ordinal position in the family and eminence primarily because the role assigned to the first born has been thought to influence the formation of personality characteristics relevant to unusual attainment (Sampson, 1965). Eiseman and Schussel (1970) have concluded that later-born males are significantly less creative than first born males on the measures of creativity. Altus (1966) and Eiduson (1962) found the first born to be generally over represented amongst inventors.

Socio-economic status in creative thinking has also been explored in a number of studies. Torrance (1978 and 1979) states emphatically that the life experiences of children from low SES prepare them for creative achievement. He argues that children who live in poverty and experience related disadvantages have to struggle for survival and this struggle poses a constant challenge to their creative potential so that they are likely to develop these abilities in a higher degree than the more advantaged and affluent peers. Further, the child from low SES has been found to indulge in fantasy much more than the children from higher social status (Feely, 1972).

As the child rearing practices are largely dependent on the number of siblings in a family, this variable is likely to have some bearing on the fostering of thinking ability in the children. It is usually observed that lesser the number of children greater is the core and control, contact and criticism, conformity and conservativeness in the child rearing practices of the parents. As the number of siblings goes on increasing, the above mentioned forces of control and conformity gradually begin to decrease resulting in greater freedom, competition. Reduction in the constraints by parents in a large family may give rise to an environment which is more conducive to the development of
creativity. Srivastava (1977) showed that the number of siblings will have some bearing on creative thinking in the positive direction.

Psychological Variables

A number of studies have been reported based on the relationship of creative thinking and psychological variables such as scholastic achievement, intelligence, academic motivation and little conclusion could be derived. To explore these relationships with the above variables many research studies have been conducted.

Liddicoat (1972) observed that the typical underachiever is more creative whereas, Getzel and Jackson (1962) did not find significant difference between groups of different creativity on grade point averages. Similar results were reported by Edward and Tyler (1964), Cicirelli (1965), Molloy (1971), Paramesh (1972), Starr and Nicholl (1975).

Intelligence is considered as major cognitive function for thinking tasks. Although much work has already been done on this variable, there is still controversy regarding the nature of relationship between intelligence and creativity and it has not yet unequivocally been resolved.

In Indian situation, the kind of curriculum is such that the students can achieve more by restricting themselves to traditional ways of studying. Since the curricula aim at bringing up conformity, students with high motivation for academic achievement, therefore, tend to restrict to the traditional method of answering their questions which may deteriorate their performance on tests requiring divergent thinking. Thus, academic motivation of the students may have a negative bearing on scores obtained on Divergent thinking tests.
Organizational Variables

Organizational variables in the school context, organization climate of the school, type of school (basis of sex) and management of school have been taken up by a number of studies to identify their role in fostering convergent thinking and divergent thinking.

Type of school can be classified as - Girls' schools, Boys' schools and Co-education schools on the basis of the sex of the population. A very few studies have been conducted in this context. The group dynamics will obviously be different in these three types of schools. Arguments have been advanced favouring both kinds of systems. Single sex schools are said to involve a simpler curriculum, fewer disciplinary problems and a greater concentration on academic rather than frivolity (Biddle, 1970). Whether a school is unisex or co-educational may determine the extent of freedom allowed to students and the control exercised by the school authorities. Since sex of students has been studied as an independent variable and found to be related significantly to creativity it is likely that the type of school (sex-wise) will also be significantly related to creative thinking.

The school climate is very important to the growth and development of the creative abilities in a child. Some studies reported that open class-room groups proved to be more creative (Horwiz, 1978, Nogrady, 1975, Wright 1974, Haddon and Lytton, 1971 and Miruchin et al 1969).

In contrast, some have reported no relationship between the organizational climate and creativity (Clark, 1972, Marburg, 1970, Solomon and Kendall 1976).
1.4. Mental Ability: Concept, Meaning and its Importance

It is an observable an fact that people differ from one another. There are wide ranges of individual differences in their behaviours. A teacher can easily discover these differences among his pupils. Some learn with a good speed while others remain lingering too long. What is the cause for one individual to be more effective in his response to a particular situation than another? No doubt, interest, attitude, desired knowledge and skill count towards this achievement. But still there is something other than these that contributes significantly towards the individual differences. In psychology, it is termed as Mental ability or intelligence. These two terms are used interchangeably in different connotations but are one and the same.

In our day-to-day conversation, one individual is said to be intelligent in proportion as he is successful in meeting general life situations. What there is in intelligence that contributes towards this success, is a question which has been attempted by psychologists in different ways resulting in so many varied definitions.

According to Stern (1914), intelligence is a general capacity of an individual consciously to adjust this thinking to new requirements. It is a general mental adaptability to new problems and conditions of life.

According to Terman (1921), "An individual is intelligent in proportion as he is able to carry on abstract thinking". David Wechsler (1912) defined intelligence as the aggregate or global capacity of an individual to act purposefully, to think rationally and to deal effectively with his environment.

From these definitions, it could be understood that mental ability is the capacity to acquire and use knowledge, a capacity supported by a host of cognitive activities such as perception, memory storage and retrieval, reasoning,
and problem-solving. In other words, mental ability is not the individual's storehouse of knowledge alone, but rather the capacity to acquire and use it.

Mental ability is the foremost cognitive function which is required for every individual to succeed in their life. There are historical evidences that individuals with superior intellect invented many things in the field of science and other areas. The research findings also reveal that intelligence and other psychological variables such as scholastic achievement, divergent thinking, personality etc. have close relationship. Further, the importance of mental ability could be clearly understood by the fact that the individuals with less mental ability are labelled as mentally retarded in the society.

There are several test batteries that have been developed by different authors to assess the intelligence of an individual. Stanford-Binet Intelligence scale, Wechsler Scale of Intelligence, Raven Progressive Matrices and Cattle Test of Intelligence are some of the effective tools considered to assess the intellectual performance of an individual.

On the basis of scores obtained through intelligence test batteries, the whole human population can be classified into different categories as gifted, average and mental retardation. Psychologists have difference of opinion regarding demarcation, drawn by Intelligence Quotient (IQ) between the average and gifted children. Some considered children with 125 IQ and above are gifted while there are others who raise this limit up to 135 or 140. The criterion is quite arbitrary and not universal.

However, IQ of below or above (as measured by an individual intelligence test) is usually accepted as most agreed criterion for separating the gifted from average population. According to American Association of Mental Deficiency (AAMD) Manual (Grossman, 1983) the degree of mental retardation can
be classified as mild (IQ 56-70), moderate (IQ 41-55), severe (IQ 26-40) and profound (IQ 25 and below). These individuals like gifted and mentally retarded need specific teaching strategy and school environments for getting into the main stream of education.

1.5 Relationship Between Mental Ability and Divergent Thinking

Research on the development of Divergent thinking and its relationship with mental ability has been the focus of research in the contemporary educational psychology. Voluminous work done on the relationship of Divergent thinking and mental ability reflect that the results are inconsistent, and need further probe.

Therefore, it still remains a current debatable issue among psychologists and researchers - whether Divergent thinking (creativity) is distinguishable from mental ability (intelligence) attracts a number of investigators.

Andrews (1930), Gatzel and Jackson (1962), Cropley (1966), Raina (1968), Phatak (1962), Meer and Stein (1955), Ripple and May (1962), have found low but positive relationship between creativity and intelligence. The study by Getzel and Jackson (1962) has shown that girls are significantly better than boys in intelligence and creativity. Contrary to the above findings Flescher (1963) has reported low but negative relationship between these two traits. The empirical researches conducted by Taylor and Holland (1962), Repple and May (1962), Decey and Madaus (1971) noted that intelligence has little or no inter correlation to creative performance in arts and science. Thus it appears that he findings are conflicting and contradictory with respect to relationship between mental ability and divergent thinking.
1.6 Different Ways and Means of Measuring Convergent and Divergent Thinking

The studies conducted by Hudson (1966, 1968) on convergent thinking concept have pointed to the relationship between convergent thinking and intelligence. He stressed that intelligence tests are measuring convergent thinking ability of an individual. It could be taken into consideration and intelligence tests are convergent thinking tests. The Indian doctoral dissertations and research reports (Buch, 1988) by employing such intelligence tests as Raven’s Standard Progressive Matrices, Cattell’s Culture-fair Intelligence Test, Ahuja Test of Group Intelligence, have studied the relationship between school achievement and intelligence, in different socio-economic groups and at different educational levels. Most of these studies reveal the relationship between intelligence and school achievements. It is generally believed that intelligence influences performance in achievement test. From this, it could be concluded that all the intelligence tests and most of the school achievement tests are meant for assessing convergent thinking ability. Hence, the convergent thinking of an individual can be assessed with the help of intelligence tests and school achievement tests.

Judith Green (1975) remarks that Guilford was the pioneer in devising tests of divergent thinking. During 1956, Guilford used several types of tests. One type called for many unusual uses of objects like brick, blanket or boot polish. Another type called for many unusual consequences of strange events like everyone on earth suddenly becoming blind or the earth’s gravitational pull suddenly vanishing. Guilford used the three dimensions namely fluency, flexibility and originality in scoring the responses of the test takers.
Morris E Eson (1975) says that Paul Torrance devised tests on creative thinking (divergent thinking) during the year 1967. He too used several types of tests. One type called for the ability to name difficulties associated in using familiar things like Pen or Chair and this ability, he described as sensitivity to problems. Another type demanded the ability to identify disharmony. In this type of test, some sentences with misplaced words were given. The respondents were asked to arrange the words correctly and write correct sentences. Another type of test called for the imagination of the test takers. They were given some simple curved lines and were asked to develop them to resemble some familiar objects. The name of the familiar object should also be specified.

Paramesh C R (1972) used a creativity instrument devised by Wallach and Kogan (1965) for his study. The Wallach Kogan battery of creativity instrument consists of three verbal and two visual techniques. The verbal techniques comprise items eliciting possible instances of a class concept (instances), items eliciting possible uses of a specified object (alternate uses) and items eliciting possible similarities between two visually specified objects (similarities). The two visual techniques consist of visual designs (pattern meaning) and line drawing (line meanings). These serve as stimuli for the subject to generate possible meaning or interpretation.

Identification and measurement of creativity has attracted the attention of Indian investigators, although in most cases the measuring tools used were those developed in the United States, particularly those devised by Torrance and Wallach and Kogan. These tests were translated into various Indian languages. Attempts were made to develop the required tools by Passi (1972), Mehdi (1973), Kaul (1974), Ramachandrachar (1974). Most of these tests have been developed along the lines of Torrance or Guilford or Wallach and Kogan.
1.7 Need for Developing Divergent Thinking among Children

The level of development of a nation is directly proportional to the identification of talent, its nurturing and optimum utilization. Most of the advanced countries have recognised this fact and have taken steps for the identification and nurturing of talent. In the case of underdeveloped countries the situation is just opposite. Rousseau laments gross neglect of the creative talent: 'In every underdeveloped country, potential Einsteins and Fords are herding cattle or breaking stones' (1962).

To turn each potential individual into a competent and high principled citizen is an urgent necessity. The solution to our problems of growth and development lies in providing a type of education to our children which will enable them to think creatively.

Education so far has emphasised abilities only in the area of convergent thinking rather than divergent thinking. We have attempted to teach children how to arrive at correct answers, but have not cared to develop the ability to answer them creatively.

Modern education must therefore, be not content with developing more role learning but also the ability of children to produce relevant new meaning of their class-room experiences. It is the urgent need that the schools should equip the child with divergent thinking and other skills which enable him to cope effectively with whatever situation in the world he/she will encounter later in life. The greatest joy of the teacher and the greatest hope for a better world lies in the cultivation of divergent thinking ability among children. To teach towards creativity is to teach towards the future of Society (Lowenfeld and Brittain, 1966). Similarly the concluding remark of the Review Committee
(1977) appointed by the Government of India has also emphasized the need for creative education to the children

1.8 Visual Impairment: Concept, Meaning and its Importance

In the classroom, children are so distributed that a majority of them may be classified as average and normal. Some children are there who deviate mentally, socially, educationally or physically from normal children. Such children require special educational care and their adjustment problems have to be tackled in an exceptional manner. These deviated children come under the designation of 'exceptional children'. The exceptional children can be classified under three major heads namely, (1) The physically handicapped, (2) The mentally retarded and (3) The gifted. The physically handicapped, can be subgrouped under the category of the crippled, visually impaired, hearing impaired, defective in speech and delicate in health. It is estimated that there are 38,788 million exceptional children in India. Among them 4,005 million are visually impaired. At present it is observed that only 17 institutions existing in India are involved in manpower development for visually impaired individuals and available trained manpower till 1995 is estimated to be 1459 (Rehabilitation Council of India, 1996).

The educators working with visually impaired children are specialised in different subjects viz., Psychology, Sociology, Surgery, Engineering etc. They are using the terms such as visually disabled and visually handicapped for visual impairment in the context of education and rehabilitation of visually impaired persons. But the term 'visual impairment' is basically a medical term. In medical terms, it means damage to the tissue affecting the functions of the visual organ. It adversely affects natural functioning of the visual organ. In the worst cases, it can result even in loss of visual function. It is termed as visual disability.
But measures can be taken to correct, cure or to ensure both for improving visual function to as near normal as possible. Thus a visually disabled individual can be made to involve in his social and economic activities as a normal person. On the other hand, there are cases where visual impairment reaches a stage which restricts individual's participation in social and economic activities and it makes them a handicap.

Hence the level of functioning of a visually impaired individual is determined by the degree of disability. The attitude of the community reduces or increases their handicap. It has been rightly said that impairment lies in the individual but attitude of the society makes an individual handicapped.

The term 'visual impairment' can be defined in two different ways, as legal blindness and educational blindness. Former is the one which the layman and those in the medical professions use. The latter is the one which educators use. Legal blindness is defined as 20/200 visual acuity in the better eye after the best correction or if vision does not exceed 20 degree in the visual field (visual acuity means the detailed central vision as in reading). A person is also considered as legally blind if his corrected field of vision is less than an angle of 20 degree. In the definition of legal blindness, 20/200 implies that an object which is usually seen from a distance of 200 feet by a normal person, is seen only from a distance of 20 feet by the person affected by the visual impairment.

For educational purposes, visually impaired individuals are those who are so severely impaired that they must be taught to read by Braille or by the use of aural method (audiotapes and records). The individual with residual vision can read print, though they need to use magnifying devices or books with large print. Because it stresses the educational variables such as methods of reading
and instruction for visual impaired children, most of the educators prefer this definition, even though it is not as qualitatively precise as the legal one.

Over 90% of the world’s visually impaired persons are found in the developing countries, more than half of whom are in Asia and a majority of them live in rural communities (Brohier, 1990). India has the major share in this population. In India, not even 5% of the visually disabled population is brought under the umbrella of education, but this coverage does not include children with different types of visual impairments.

1.9 Different Types of Visual Impairments

An analysis of the terminology in general Survey Books in the field of special education published from 1980 to 1981 (Cleland & Swartz, 1982, Hallahan & Kauffman) revealed some inconsistencies. Except one which used the title of visual handicaps, all other chapter headings used visual impairments’ Recent books specific to the field of visually handicapped generally use the term ‘visually impaired’ as the descriptive term. The term ‘visually impaired’ is being used widely at present to denote the total group of children who have impairments in the structure or functioning of the visual sense organ - the eye, irrespective of the nature and extent of the impairment. But in the educational and rehabilitation context, it is difficult to apply a single strategy to the total group of children with impaired vision. The nature and the extent of visual impairment are to be given due consideration while framing intervention and teaching strategies.

The nature of visual impairment refers to what extent the particular individual can use his/her limited vision for learning and day-to-day activities. There are cases where impairment reaches a stage which fully restricts the
— individual’s visual function. These individuals cannot perceive any objects in their environment with the help of their eyes. On the other hand, some individuals may have useful limited vision for their day-to-day life activities. Educators and rehabilitation personnel working with low vision individuals must change their working strategy which may differ sharply from that of totally blind individuals. In this line, the total population of visually impaired individuals can broadly be classified under two major categories, as totally blind and low vision.

**Totally Blind**

According to Jill Keeffe (1992), totally blind refers to an individual’s inability to detect the direction of light, identify the shapes, or has no vision at all. These individuals cannot perceive information in visual form and can only follow information by the use of tactile (touch) sense and auditory (hearing) sense. The totally blind children require special education because they are different from children of normal vision. They are unable to read printed letters and textbooks. They perceive objects in their environment with the help of touch and auditory senses. In the nineteenth century, France Louis Braille, himself blind, introduced the basic system of writing for totally blind individuals, that is used today. The communication system developed for totally blind individuals by Louis Braille is known as Braille system. The basic unit of Braille is a quadrangular cell containing a combination of six raised dots. It helps the totally blind children to perceive most of the written communications and enhances their social interaction to a minimum extent.

**Low Vision**

According to Jill Keeffe (1992), an individual who has visual acuity less than 6/18 or visual field less than 10 degrees in diameter after the best
correction (treatment or with spectacles) is considered low vision. A person with low vision can use vision for learning about the world, for planning and doing tasks that need vision. These individuals cannot read normal print even after all sorts of correction but can read only large prints. The low vision children can use their limited vision for educational purposes and day-to-day activities (Hanninen, 1975). The two general methods of aiding low vision children to read print are large print books and magnifying devices. Large print books are simply the books printed in large size type. This text, printed primarily for sighted readers, is done in 10-point type. The type size for low vision readers ranges up to 30-point type and 18-point type, which are most popularly used. The magnifying devices range from glasses and hand-held lenses to closed circuit television scanners that present enlarged images on a TV screen. These devices can be used with normal-size type or large type books.

There is another dimension to classify the whole visually impaired population on the basis of onset of blindness. Onset of blindness refers to at what age the particular individual became blind. Some individuals may be blind at birth itself, who are known as born blind. On the other hand, the individuals who became blind after a few years of sight are known as acquired blind or adventurously blind. These two categories of visually impaired individuals vary in conceptual development, which is rather essential for effective interaction with the society.

In general, there are two major types of educational service available for visually impaired children in practice. They are special school program and integrated school program. According to Krik Horten (1988), integrated education programs are programs where visually impaired children attend a regular school in their home community. The visually impaired children live at home and go to
the same schools as their sighted brothers, sisters and friends. They study in
the regular classroom with the regular teacher but receive extra help or 'support
services' from a special education teacher who has been trained to work with
visually impaired children.

According to Knk Horten (1988), special schools are schools where all
students are visually impaired children. Often these schools are residential
schools where the visually impaired children live and study during the school year
and return home on weekends or school vacations. In India, it is estimated that
6,180 and 10,471 visually impaired children are enrolled in integrated
education programs and special education programs respectively (International

1.10 Need for Developing Tools to Assess Convergent Thinking,
Divergent Thinking and Mental Ability of Visually Impaired
Children

Throughout the field of education, the assessment and evaluation is
still a worrisome matter because of the questionable validity of some tests and
the unreliability of the scores obtained. This fact is especially true in special
education in using psychological and educational evaluation of present
functioning in visually impaired children for predictive purposes. Since many
educators working with visually impaired children are not psychologists, and since
many psychologists have had little opportunity to study the effects of reduced
vision or total lack of vision on children's psychological aspects, it is even more
difficult to come by.

For a period of time, there seemed to be a need to test and assess
visually impaired children both psychologically and educationally to compare
their ability with that of sighted children by using tests and tools designed for
not yield fruitful results which forced the researchers to find out alternative approaches. Recently, researches attempted to develop tools for assessing psychological and educational functioning of visually impaired children. Some of them are Interim Hayes - Binet Mental Ability Test for Blind, Wechsler Adult Intelligence Scale, Verbal (WAIS), Wechsler Intelligence Scale for Children (WISC), Knox Cube Tests, Wallin Pegboard, Catell Infant Intelligence Scale, Vocational Intelligence Scale for Adult Blind and Revised Beta Examination. Further, Halpin, Halpin and Torrance (1973), Tisdall, Blackhurst, and Marks (1971) developed tools to assess the creative thinking of visually impaired children. The review shows that considerable amount of efforts has been taken to develop psychological tools for visually impaired children. But these tools are not culture-free in nature and cannot be administered satisfactorily with visually impaired children in developing countries, especially in India. Hence, there is an urgent need to develop tools to assess the psychological aspects of visually impaired children in India. The psycho-educational assessment and diagnosis of visually impaired children in existing programs, which are conspicuously missing, obscures the problems in this field. Systematic efforts are therefore, necessary to develop the tools to assess the different psychological aspects of visually impaired children. The present study is an attempt to develop the tools to assess the divergent and convergent thinking of visually impaired children studying at secondary level.

The review of literature related to the present study has been dealt within the succeeding chapter.