CHAPTER I

INTRODUCTION

1.0 Introduction

There is relatively a large group of individuals within the school system who for unknown reasons have difficulty in learning from the usual methods of instruction. No single cause or combination of causes has been identified to account for the multiplicity of problems exhibited. How we learn depends on our development in all areas. None of us develops evenly. We all have our strengths and weaknesses. Most average students have some problems in school learning. In a class at least 20 percent of the children get poor marks. We brand him/her ‘lazy’ or ‘stupid’. It should be realized that, no child wants to be lazy or careless. Every child loves to stand up and be counted. If he gets poor marks it is because he/she suffers from a learning problem. Therefore, poor school performance observed in young children should be seen as a symptom reflecting on a larger underlying problem. Poor performance in school may be because of causes in the child (physical, intellectual or behavioural) or due to disturbances in the environment (such as home and school).

In contrast, about 10% of children who have normal IQ, have specific developmental disorders of scholastic skills or a Learning Disability. They also get poor marks. Their brain growth is normal, but miniscule brain areas concerned with skills of reading, writing, spelling, language or arithmetic have
not developed adequately. Currently about 10 percent of young children suffer from this handicap called Learning Disability.

Problems vary with each child and it is essential to evaluate and consider all contributing factors before deciding what sort of help is needed. We should scientifically analyse the symptoms, discover its underlying cause and find a remedy to enable the child to perform better.

1.1 Learning Disability

Learning Disability, a recent category of handicapping condition is currently the largest category in special education. Learning Disabilities are neurological disorders that interfere with a person's ability to store, process or produce information and create a gap between one's ability and performance. Individuals with Learning Disabilities are generally of average or above average intelligence.

Learning Disabilities can affect a person's ability to speak, listen, read, write, spell, reason, recall, organise information and do mathematics.

Learning Disabilities can affect one or more areas of development. Individuals with Learning Disabilities can have marked difficulties on certain types of tasks while excelling at others. The impact of the disability ranges from relatively mild to severe. Recognizing a Learning Disability is difficult because the severity and characteristics vary.
Learning Disabilities are not the same as the handicaps such as mental retardation, autism, deafness, blindness, behavioural disorders nor are Learning Disabilities the result of economic disadvantage, environmental factors or cultural differences. Learning Disability cut across all economic and social classes. However, children from deprived environment are particularly vulnerable.

The Learning Disabled child has average or above intelligence, adequate sensory acuity but is achieving considerably less than a composite of his intelligence, age and educational ability would predict (Gearheart, 1973).

Learning Disability can’t be cured or fixed. It is a life long issue, but with the right support and intervention, children with Learning Disabilities can succeed in school and go on to successful often distinguished careers later in life.

1.2 Definitions of Learning Disabilities

Debate about the best definition of Learning Disabilities has raged since this field has begun in the 1960s. Since then, almost forty different definitions have been proposed. The following definitions are important for several reasons. The United States Office of Education’s definition is the basis for determining Learning Disabilities among school age children. The Learning
Disabilities Association of America's definition reflects the views of one of the largest advocacy groups for Learning Disabilities in the country. The more recent Learning Disabilities definition of the National Joint Committee on Learning Disabilities was acceptable to most advocacy and professional organizations. Each of these definitions are given below.

a) The 1977 U.S. Office of Education's Definition

The term "Specific Learning Disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, speak, read, write, spell or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. The term does not include children who have Learning Disabilities which are primarily the result of visual, hearing or motor handicaps or mental retardation or emotional disturbance or of environmental, cultural or economic disadvantage.

b) Definition of the Learning Disabilities Association of America (1986)

Specific Learning Disabilities is a chronic condition of presumed neurological origin which selectively interferes with the development, integration and/or demonstration of verbal and/or nonverbal abilities. Specific Learning Disabilities exist as a distinct handicapping condition and varies in its manifestations and in degree of severity. Throughout life, the condition can
affect self esteem, education, vocation, socialisation, and/or daily living activities.

c) The National Joint Committee on Learning Disabilities (1988)

Learning Disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction and may occur across the life span. Problems in self-regulatory behaviours, social perception and social interaction may exist with Learning Disabilities but do not by themselves constitute a Learning Disability. Although Learning Disabilities may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction) they are not the result of those conditions or influences.

The common points of definition of Learning Disabilities are

1. There is a significant difficulty in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities.

2. Students with Learning Disabilities have intelligence scores within the normal range. But there is a marked difference in general ability or intelligence and his/her actual achievement in terms of reading, writing, spelling and arithmetic.
3. Although Learning Disabilities may occur along with other handicapping conditions (sensory impairment, mental retardation) and serious emotional disturbance or with extrinsic influences (cultural differences, insufficient instructions) they are not the result of those conditions or influences.

4. These disorders are intrinsic to the individual and it is due to dysfunction of central nervous system.

1.3 Characteristics of Learning Disabled

Learning Disabilities are characterized by a significant difference in the child’s achievement in some areas as compared to his or her intelligence. Students who have Learning Disabilities may exhibit a wide range of traits, including problems with reading comprehension, spoken language, writing or reasoning ability. Hyperactivity, inattention, and perceptual coordination problems may also be associated with Learning Disabilities. Other traits that may be present include a variety of symptoms such as uneven and unpredictable test performance, perceptual impairment, motor disorders and behaviours such as impulsiveness, low tolerance for frustration, and problems in handling day to day social interactions and situations.

1.4 Causes of Learning Disabilities

Exact cause of Learning Disability is not yet known. It is not possible to speak of any single factor or group of factors as directly causing a Learning Disability. Literature cites many different causes related to a Learning Disability. The following are the most important factors which may contribute to a Learning Disability.
1. Neurological Damage

Children with Learning Disability share several characteristics found in persons with brain damage caused by injury or infection. Neurological damage can also occur during the prenatal, natal and post natal periods, resulting in Learning Disability.

2. Maturational Delay

Another theory to explain Learning Disability suggests that it occurs because there is a maturational delay within the neurological system. Bender (1973) observed that if differential stages in the development of the brain are delayed, there occurs a maturational lag. A fair amount of research supports Bender's view that maturational delay is associated with Learning Disability.

3. Genetic Factors

Learning Disabilities tend to run in families. It is not unusual to discover that people with Learning Disabilities come from families in which other family members have reported similar difficulties.

4. Bio-chemical Factors

Chemicals play an important role in brain activity, controlling and releasing electrical nerve impulses between neurons. Absence or even excessive amounts of bio-chemical substances cause a biological imbalance. There has been high speculation of these neuro-transmitter abnormalities laying a role in causation of Learning Disabilities.
5. **Nutritional Deficiencies**

The developing child requires adequate nutrition, specially so in the first six months. A poor diet and severe malnutrition can reduce the child's ability to learn by damaging intersensory abilities and delaying development.

Finally, environmental factors do not contribute Learning Disabilities but contribute to the severity of Learning Disabilities.

1.5 **Kinds of Learning Disabilities**

The four different kinds of Learning Disabilities are:

1. **Dyslexia** - A language based disability in which a person has trouble in understanding words, sentences or paragraphs i.e. disorders of reading.
2. **Dysgraphia** - A writing disability in which a person finds it hard to form letters or write within a defined space.
3. **Dyscalculia** - A mathematical disability in which a person has a difficulty in solving arithmetic problems and grasping mathematics concepts.
4. **Auditory and visual processing disabilities** - A sensory disability in which a person has difficulty in understanding language despite normal hearing and vision.

1.6 **Identification of Learning Disability**

An examination of the literature on early identification of psychoeducational problems reveals that over the past decade, considerable effort has been directed towards utilizing screening tools to detect learning and behavioural problems in the classroom. The major function of screening programmes is the
early recognition of children who are displaying signs of developing or impending Learning Disabilities. The purpose of screening is to identify students successfully according to some predetermined taxonomic strategy. Most screening programmes do not involve any detailed remediation or prescriptive planning assessment. The emphasis instead is on grouping and classification for the purpose of more efficient subsequent decision making.

Since the goal of screening is to make initial categorizations, not to measure or discriminate fine details, less sensitive instruments and less sophisticated techniques can be used.

A screening programme is really just as an organized effort to gather information regarding certain behaviours and to display them in some meaningful way related to subsequent activities. The gathering of data and information may be either through informal approaches or by formal approaches.

Informal Approaches

A careful perusal of the professional literature will uncover many aids toward the preparation of informal screening materials, selection of special screening instruments or adaptation of existing instruments for screening purposes.

The viewing of everyday classroom behaviour although matched to some structured observational categories is an informal process. Checklists and
rating scales are also informal. Informal techniques are often structured around areas. Myers and Hammill (1969) have suggested that in screening for Learning Disabilities, seven specific areas should be assessed:

1. Auditory functions
2. Visual functions
3. Tactual - Kinesthetic functions
4. Vocal behaviour
5. Motor behaviour
6. Memory
7. Sequencing ability

Sometimes teachers, parents and others are asked to use behavioural checklists and inventories that help isolate behaviours that have demonstrated some relationship with the categorization strategy being used.

In using teacher or parent observation as a major means of noting symptomatic behaviour, it is very important to provide some observational categories if any reliable agreement is to be obtained. There are several identifiable categories that are critical to the analysis and prediction of Learning Disabilities. Each of these categories is broken down into a short series of observable behaviours in that area. A behaviour checklist that followed such a structure could be a very useful part of screening Learning Disabilities.

Formal Approaches

A tremendous number of different formal instruments and batteries are used in screening Learning Disabilities. Instruments should be selected and
batteries built according to the stated and intended objectives of the individual screening programmes. Tests that may be used to identify Learning Disabled students may be considered in three main categories:

a) Measures of Intelligence

These tests measure general ability and many areas of intellectual functioning. These tests are very essential to verify that a child is Learning Disabled or not. Intelligence tests may be used as a tool for analyzing a variety of intellectual operations in a standardized manner and working out areas of strength/weakness. Stanford Binet and Weschler Intelligence scale for children are the two most commonly used intelligence tests in India.

b) Measures of Academic Functioning

Keeping in view the definition of Learning Disabilities, it is necessary to assess academic skills in reading, spelling, writing and arithmetic. Achievement tests and diagnostic tests are used for this purpose. They enable the teachers to know as much as possible the student’s abilities in all academic areas. Some of the tests that can be used to measure academic functions are Wide Range Achievement Test (WRAT), Peabody Individual Achievement Test (PIAT) etc.

c) Measures of Certain Cognitive Areas

These tests may be diagnostic tests in the various academic or skill areas, test of language development and visual or auditory discrimination tests. The Bender visual-motor Gestalt test for children (Bender, 1938), Goodenough
Harris Drawing test (1963). Development test of visual-motor integration (Beery and Bukterica 1967) are a few examples for measures of certain cognitive areas.

1.7 Mathematics Disability

Severely impaired ability to calculate or perform mathematical functions presumed to be caused by central nervous system dysfunction is called dyscalculia or Mathematics Disability. There is no single Mathematics Disability. In fact, mathematics disabilities are as varied and complex as those associated with reading. One type of Learning Disability affecting mathematics can stem from an individual's difficulty in processing language, another might be related to visual – spatial confusion while yet another could include trouble in retaining mathematics facts and keeping procedures in the proper order. While extremely rare, there are some Learning Disabled pupils who cannot successfully compare the lengths of two sticks and others who have almost no ability to estimate. While children with disorders in Mathematics are specifically included under the definition of Learning Disabilities (Federal Register, 1977), seldom do mathematics difficulties cause children to be referred for evaluation. Even after being identified as Learning Disabled, few children are provided substantive assessment and remediation of their arithmetic difficulties (Goodstein and Kahn, 1974). This relative neglect might lead parents and teachers to believe that arithmetic learning problems are not very common or perhaps not very serious. However, approximately 6% of
school-age children have significant mathematics deficits (Kosc, 1974, Badian, 1983) and among students classified as Learning Disabled, arithmetic difficulties are as pervasive as reading problems (Badian, 1983; McKinney and Feagans, 1980). In today's world, mathematical knowledge, reasoning and skills are no less important than reading ability (Paulos, 1989, and Steen, 1987).

Problems with mathematics usually begin in elementary school and continue through secondary school into adulthood. The statistics regarding mathematics performance among students with Learning Disabilities are alarming. Cawley and Miller (1989) reported that eight and nine year old students with Learning Disabilities performed at about a first grade level on computation and application. Likewise, Fleishner, Garnett and Shepherd (1982) found that sixth graders with Learning Disabilities solved basic addition facts no better than third graders without Learning Disabilities.

Other researchers have spent time comparing the mathematics performance of students with disabilities with that of students without disabilities. Although reports have emerged discussing the poor mathematics performance of many general education students in the United States, numerous investigators have found that students with Learning Disabilities experience even greater difficulty in mathematics than their peers without disabilities (Ackerman, Anhalt and Dykman, 1986)
Mathematics Disabilities are common, significant and worthy of serious instructional attention in both regular and special educational classes. Students may respond to repeated failures with withdrawal of effort, lowered self-esteem and avoidance behaviours. In addition, significant mathematics deficits can have serious consequences on the management of every day life as well as on job prospects.

Mathematics learning problems range from mild to severe and manifest themselves in a variety of ways. Most common are difficulties with efficient recalls of basic arithmetic facts and reliability in written computation. Language disabilities can interfere with mathematics learning. Many Learning Disabled children experience difficulty bridging informal mathematics knowledge to formal school mathematics. An extremely handicapping, though less common mathematics disability derives from significant visual-spatial motor disorganization.

There are many challenges embedded in the educational aspects of mathematical disabilities. In addition to diverse learner characteristics, a variety of environmental factors influence the progress that is made with regard to teaching mathematics to students with Learning Disabilities. Educators must carefully consider how to keep students with disabilities in school and motivated to reach their life goals.
1.8 Different Types of Mathematics Disabilities

Learning Disabled children manifest different types of disabilities in mathematics (Badian, 1983; Cohn, 1971, Kosc, 1974, Strang and Rourke, 1985). Research attempting to classify these has yet to be validated or widely accepted.

In primary classes, they may be unable to associate numbers with quantity and discriminate between right and left. There is a tendency to reverse numbers and confuse ‘before’ and ‘after’. Spatial orientation and ability to make estimations of space, size, time, shape and weight tends to be poor. Learning Disabled students tend to work on a concrete level and are slow to acquire abstract reasoning skills which are very much necessary for problem solving in the higher classes. A study by Skrtic (1980) indicated that Learning Disabled students are significantly delayed in the area of formal reasoning and concept development.

Johnson and Myklebust (1967) have prepared a list of specific behaviours that are indicative of arithmetic disability. These are inability

a) to establish a one-to-one correspondence
b) to count meaningfully
c) to associate the auditory and visual symbols
d) to learn both the cardinal and ordinal systems of counting
e) to visualize clusters of objects within a larger group
f) to grasp the principle of conservation of quantity
g) to perform arithmetic operations
h) to understand the meaning of the process signs
i) to follow and remember the sequence of steps to be used in various mathematical operations
j) to understand the principles of measurement
k) to read maps and graphs
l) to choose the principles of solving problems in arithmetic reasoning.

Further research in this area was conducted by Hacaen (1967) and Kosc (1974). Kosc (1974) introduced the term developmental dyscalculia. He classified true dyscalculia as consisting of symptoms that would be grouped into the following six categories:

1. Verbal dyscalculia - difficulty with verbal use of mathematical terms and symbols
2. Practognistic dyscalculia - inability to recognize distinguishing features or to make comparisons of objects that vary on some dimension, for example size
3. Lexical dyscalculia - difficulty in reading digits, symbols or multi digit numbers
4. Graphical dyscalculia - difficulty in writing dictated numbers or copying symbols
5. Ideognostical dyscalculia - difficulty in comprehending mathematical ideas and making mental calculations
6. Operational dyscalculia - difficulty in completing basic operations of addition, subtraction and so on, including confusion among the operations and the appropriate algorithm for each

Cawley et al. (1976) cited four specific reasons why children fail to learn mathematics and these deserve special attention:
1) Incorrect instruction
from teachers who have a limited knowledge of what alternative strategies to use
2) The learner lacks the prerequisite skills needed to understand a concept 3) The teacher pays attention to giving negative feedback related to incorrect answers and ignores any correct step in the sequence 4) failure to diagnose error patterns.

Wood (1980) suggested that many Learning Disabled children find the modern mathematics approach particularly difficult to understand because of several reasons. First, they find the language and vocabulary used in modern mathematics very difficult and set notations presents them with directional problems

Other researchers (Cawley et al., Johnson and Myklebust, 1967, Lerner, 1981, and McLeod and Crump, 1989) examined a variety of related deficits that may compound the problem

1. **Deficits** in auditory reception makes it difficult to attach meaning to concepts presented orally.
2. **Deficit** in attention interferes with the ability to concentrate
3. **Problems** in memory makes recall difficult, for example, retrieving symbols and then meaning
4. **Verbal** related problems make it difficult to deal with tasks requiring verbal reasoning
5. **Perceptual errors** (visuospatial and visuomotor) may cause incorrect visual representations
6. **Left-right confusion** may occur
Rosalie and Harriet (1982) classified disabled mathematics students into two groups those with language disorders and those having visual spatial problems.

Language disorders such as

1. Poor auditory recall
   a) Cannot remember the names of the numbers
   b) Slow to master the number facts and in particular, may fail to memorize the multiplication tables
   c) Has difficulty in holding numbers in mind

2. Poor Sequencing
   a. Has trouble in counting forward, backward and skip counting
   b. Cannot follow a multi-step procedure

3. Difficulty in Reading and Writing Numbers
   a. Has difficulty with numbers whose names are not written the way they are spoken

4. Left-right Orientation
   a. Reverses while writing numbers
   b. Reverses while reading numbers

5. Language
   a. Displays weakness in mastering the vocabulary of number, spatial position and spatial relationships such as more than, less than, greater, lesser, before, after, carry, borrow, numerator, denominator, prime numbers, prime facts etc
   b. Word problems are hurdle to the Learning Disabled
Children with Visual-Spatial Problems

This group smaller in total number than the first group, shows visual-spatial weakness related to the ability to perceive and analyze spatial patterns in mathematics. They are basically perceptual difficulties

1. Spatial Discrimination
   a. Poor spatial judgements when working with concrete materials

2. Visual Perception
   a. Slow learning of relative position on a number line
   b. Cannot see similarities and differences in given figures
   c. Disalignment - difficulty in lining up numbers so that they are in the proper column. This leads to incorrect solutions

3. Poor visual spatial memory
   a. Inability to transfer between horizontal and vertical forms for example

\[
3 + 6 = 9, \quad 3 + 6 = 9
\]

4. Visual Rotation
   a. Confusion of signs due to visual rotation such as + and x
   b. In the higher grades, confusion about the forms and angulatations in geometry and locating coordinates in algebra.

1.9 Assessment of Mathematics Disability

The best method of assessing mathematical deficits is to use informal classroom tests. The tests must be prepared very carefully so that the teacher can analyse why errors are occurring and where exactly the child is going
Wrong Teacher-made informal tests are very useful because they are target-specific, practical and easy to implement.

Most standardized achievement tests have subsections that deal with arithmetic, geometry, problem solving and so on. In case a more detailed assessment is required, the teacher should use diagnostic tests which assess basic arithmetic operations, decimals, fractions and so on.

Researchers and teachers must continue to work together to determine which curricula and instructional practices will bring about the best results in the shortest amount of time. Sensitivity coupled with knowledge will help facilitate the decision-making process when designing curricula, providing instruction and developing school policy.

1.10 Academic Backwardness

Academic Backwardness is represented as scholastic deficiency indicated by a failure to perform on standardized tests of attainment at a level commensurate with chronological age.

In any class, a teacher may have in mind a standard of attainment in academic subjects which he/she expects the average child to reach and whoever fails to attain that standard is taken for granted as Academically Backward child in the class. Sometimes a backward child is said to be one who compared with other children of his own age does very poorly in his school work.
Generally, the child who cannot derive benefit from the ordinary type of instruction carried on in his class is considered as Academically Backward child. Although backwardness by definition is a scholastic condition, but it is at bottom a psychological characteristic arising from and affecting the pupils entire personality. Scholastic failure is essentially the psychological failure In that respect backwardness is not merely an educational problem, it is equally a personal and social problem, since the Academically Backward feel deep frustration in life and some of them easily relapse into delinquency and other anti social ways of living. Certain pupils known as disadvantaged pupils, often tend to remain at a disadvantage when compared to other pupils of equal intellectual ability in academic achievement and may become backward.

A backward child may be dull, normal or superior. High intelligence is no guarantee against emotional imbalance and social maladjustment which impedes progress in school subjects. In the opinion of Schonell (1942) “although specific backwardness is found at all levels of intelligence --- it is a pupil of average and below average intellectual level who most frequently experiences specific difficulties in the primary subjects”

1.11 Definitions of Backwardness

According to British educational psychologist Burt (1937), Backward child is one who in the mid school career is unable to do the work of the class next below that which is normal for his age.
Schonell (1942) defines a Backward pupil as one, who compared with other pupils of the same chronological age shows marked educational deficiency.

1.12 Types of Academic Backwardness

On the basis of its nature, Academic Backwardness is classified as general and specific. General Academic Backwardness affects achievement in all school subjects and specific relating to one or two aspects of school work only like reading, writing or arithmetic.

1.13 Causes of Academic Backwardness

Academic Backwardness in school is caused by plurality of factors. These factors are physical, intellectual, emotional, economic and social in nature and some lie within the individual and some are entirely environmental.

Burt (1937) classified causes of his backward pupils as

a) Inherited conditions
b) Environmental conditions relating to (i) school (ii) home
c) Physical conditions either (i) developmental (ii) pathological
d) Psychological conditions of (i) intellect (ii) temperament

He concluded that in the typical backward pupil, not one cause, but several are at work.

Schonell (1942) developed and modified the scheme proposed by Burt in classifying the sources of individual differences in children. His scheme included: intellectual characteristics (general intelligence, specific mental
abilities, level of school attainments), emotional tendencies (instinctive and emotional impulses, interests and complexes), physical conditions (constitution, specific physical advantages or defects, general physical condition) and environmental influences (within school, in society, at home)

In general, two broad categories of causes of backwardness are

1) Internal 2) External.

1. Internal Causes
   a) Child may have poor health or suffering from physical ailments and chronic diseases etc.
   b) Child may suffer from some body defects like defective vision, auditory, speech and motor defects.
   c) Child may not be utilizing his intellectual powers like power of concentration, reasoning and thinking because of some defects in his brain system or its functioning or an account of some emotional and psychological pressure generated as a result of his personal and social maladjustments.

2. External Causes
   a) Defective home environment
      The uncongenial and improper environment prevailing in one's family makes a pupil backward. Such negative factors present at one's home may be listed as below:
      i) Tensions, conflicts and quarrels at home between the parents and among the members of the family.
      ii) Improper behaviour with the child due to over protection, negligence, rivalry, jealousy etc.
      iii) Poverty, illiteracy and intellectual inferiority of the parents or guardians.
      iv) Over engagement of children in household activities or family occupation.
      v) Noisy environment and inadequate physical facilities for study.
It is in the poor, overcrowded, insanitary households where families are large, where the children are dependent solely on the state for their education and where the parents are largely dependent on charity or relief for their own maintenance, where both birth rates and infantile death rates are high and the infants health is undermined from the earliest days of its life, that educational backwardness is most prevalent. Emotional imbalance, insecurity, anxiety, nervousness, too much dependence and lack of confidence, produced in the social climate, where the parent's attitude is either too harsh and dominant or too indulgent, also contribute to backwardness.

b) Defective School Environment

The adverse and unfavorable conditions and improper environment prevailing in the school lead the child towards backwardness. These conditions and factors may be of the following nature:

(i) Lack of discipline and poor administration

(ii) Lack of trained and qualified teachers and

(iii) Lack of material facilities in terms of accommodation, furniture, library, teaching-learning aids etc

1.14 Mathematics Backwardness

Mathematics Backwardness is nothing but a sort of failure in learning and doing mathematics on the part of a child in general and Academically Backward child in particular. Cognitive factors, psychomotor factors, physical
and sensory factors and social and emotional factors are the vital factors that influence learning mathematics

Ability to succeed in mathematics is dependent upon at least a normal degree of general intelligence, that is on the ability to see relationship and to apply them to new situations. Furthermore, mathematics is strikingly susceptible to the influence of emotional attitudes and tendencies. Pupils who are nervous, highly strung, unstable or lacking in persistence or concentration show their handicaps soonest and most markedly in mathematics.

1.15 Diagnosing Difficulties in Mathematics

The mathematics teacher can do a better job of diagnosing pupil difficulties in mathematics. A teacher knows the levels of his respective pupils in mathematics through weekly or monthly tests or simply by the observation of his pupils class work. The teacher may notice the kinds of errors pupils make and offer assistance at that moment to remedy the exhibited deficiencies. Achievement test in mathematics can be used to know the level of achievement of pupils in general and Academically Backward pupils in particular. A diagnostic test can also be used for the specific purpose of analysing the exact nature of the progress made by Academically Backward pupils in each important aspect of mathematics. Diagnostic test takes into consideration of all the vital skills involved in each important aspect and these are tested by a series of carefully graded examples which cover all important steps in the acquisition of the skill. Thus by knowing the exact nature, extent and cause of the errors,
the teacher can distribute his time and apply suitable remedial work more effectively.

Despite the increased attention given to mathematics during this century, we are in a state of infancy regarding how to effectively teach mathematics to Academically Backward children. Basic principle of teaching mathematics to Academically Backward pupils include content sequence, use of concrete manipulatives and individualizing mathematics instruction.

With a view to analysing the disabilities/difficulties faced by Learning Disabled and Academically Backward pupils in doing mathematical Problems, the following areas of Mathematics were identified:

1. Number Recognition
2. Basic Number Facts
3. Sequencing
4. Left-Right Recognition
5. Mathematical Terms
6. Mathematical Symbols
7. Computation
8. Word Problems
9. Visual Perception
10. Measurement, Money & Time
1.16 Factors Affecting the Performance in Mathematics

1.16.1 Home Life Experience

The emotional and social life of the child within the home is one of the most significant factors in scholastic progress. Parents have an important, positive influence on the academic aspirations and achievement of their children. They play an indispensable role in the learning process and performance of children. It is clear that the parents of children with relatively high educational aspirations and achievement tend to manifest academically relevant attributes themselves. Parents rejecting attitude towards children makes them fearful, insecure, attention seeking, jealous, aggressive and hostile (Bandura and Walters, 1959; Pepitone and Wihlpezeski, 1960).

A lot of studies have been conducted to show the impact of Home Life Experience on children's scholastic achievement. Morrow and Williamson (1961) while analysing the background of family factors responsible for higher achievement of school children concluded that more congenial home environment, less parent domination and sympathetic parental encouragement have been responsible for the achievement of the children. Henderson and Merritt (1968) reported that children in high potential group apparently come from the backgrounds that offered a greater variety of stimulating experiences than were available to those children in the low potential group. Marjoribanks (1976) demonstrated among both sexes, family environment is strongly associated with performance measures. Shaha and Sharma (1984) observed that
highly significant positive relationship crust between the variables of family climate and academic achievement. Jagnathan (1986) also found that Home Life has a strong association with academic achievement. Moos and Moos (1986) found that family environment has significant influence on the behaviour development and social competence of children.

One of the factors responsible for the poor performance in Mathematics is poor family climate. Most of the poor performers are from such environments that do not provide them with opportunities of assimilating the elementary ideas of the number which much younger children from better homes acquire even in their pre-school years. It indicates that the children coming from poor homes are devoid of stimulation and they start school with considerable disadvantages. They lag increasingly behind their peers in mathematics. Their learning difficulty increases as time goes on.

Learning Disabled and Academically Backward pupils need love and understanding and a stable and encouraging environment. Such children have temperamental and emotional difficulties and mental conflicts arising in the social environments in the home. To overcome these conflicts, the material and social environments at home should be improved.

In the present study, the following factors of Home Life Experience viz., Educational Encouragement, Family Climate, Peer Group Participation and Extra Curricular Activities were taken in order to see their influence on
Performance in Mathematics of Learning Disabled and Academically Backward pupils.

1.16.2 Intelligence Quotient

School education depends highly on cognitive development of the individual. Many correlation studies have indicated the contribution of this ability on the learning outcomes of the individual. One of the important factors that affects Mathematics learning and performance is the level of intelligence of the child. Lack of intelligence may be a major factor contributing to Mathematics Backwardness. In every aspect of mathematics, intelligence seems to play a vital role.

The contribution of cognitive ability on school performance though has been much investigated, a general theory of performance is lacking. A review of literature on this area reveals that there were always opposing points of views contingent to the experimental approaches.

Friedman (1969) examined 180 boys and 180 girls and classified them into three levels of intellectual abilities and tested the three criterion intelligence groups on three levels of scholastic performance. He found that among the high scholastic performers there were only high intelligence subjects, but with low scholastic performers, there were both high and low intelligence subjects.
Mevarech (1985) in his study establishing the relationship between intelligence, temperament and mathematics performance with 104 students in arithmetic classes, found that variance in mathematics performance attributing to variance in temperament characteristics than to variation in intellectual abilities. Indian scenario shows multiple investigations in relation to cognitive ability and scholastic performance. Srivatsava (1967), Lalithamma, (1975) in their studies found that how non intellectual factors like social and physical conditions contribute significantly to scholastic backwardness than intellectual factors.

In the case of Learning Disabled pupils, they have average or above average intelligence, but they show a significant differences between their IQ and academic achievement in terms of reading, spelling, writing and arithmetic

In the present context, Cattell’s culture fair scale 2, form A intelligence test was selected to measure general mental ability of Learning Disabled and Academically Backward pupils. The test consists of four subtests viz., series, classification, matrices and conditions which test reasoning on a ‘perceptual’ basis.

1.16.3 Mathematics Attitude

Attitudes are positive or negative feelings that an individual holds about objects, persons or ideas. They are generally regarded as enduring though modifiable by experience or persuasion and as learned rather than innate. Since
Atitudes are not inherent, but learned (Sorenson, 1964) attitude formation may be a matter of imitation.

Meier (1970) has defined the term attitude as a kind of mental set. Thurston (1946) has defined attitude as the degree of positive or negative effect associated as with some psychological object. The individual who has associated positive effect or feeling with some psychological object is said to have a favourable attitude towards the subject or object.

Mathematics attitude refers to the feeling of likes (favourable) or dislikes (unfavourable) towards Mathematics. An individual's social and cultural background play an important role in the formation of favourable or unfavourable attitude towards Mathematics. The child accepts the views of the parents and other significant members of the community, views of the peers and ideas and feelings communicated by the teachers and these views unconsciously develop a favourable or unfavourable Mathematics attitude, which would affect his or her performance in mathematics. Attitudes towards Mathematics are apt to become increasingly negative with prolonged failure and frustration leads to unwillingness to try Mathematics, unlike other subjects demands more precision and definiteness, and this very nature of the subject may be instrumental in developing a negative attitude in a child who has faced repeated failure. Promoting a favourable attitude towards mathematics is needed in encouraging the student to pursue the subject with eagerness and persistence.
1.16.4 Behaviour Problems

The most disturbing influence in a classroom setting for instructor are the behaviour problems of children. The causes of such behaviour are numerous and the behaviour themselves are varied in significance. They range from single isolated incident to the manifestations of serious persistent problems. Most children with behavioural difficulties have a history of failure in academics as well as in coping with rules and routines.

Behaviour problems found to be having linear impact on Learning Disabilities. The first basis for discerning the probability of a Learning Disability being present is the appearance of some general problem behaviour, a method that is frequently used as the starting point for screening programmes.

A list of behavioural characteristics that are symptomatic of possible psychological process disorders is sometimes used for identifying Learning Disability. Such lists should be accompanied by criteria for determining a possible process disorder. Behaviours are listed for each subskill that might be symptomatic of a processing disability. The teacher checks on whether the student displays these symptoms while performing failed tasks. These screening procedures provide guidelines for observable behaviours that help the educators to recognize Learning Disability.

Meier (1970) reports on behaviours that teachers have identified in children correctly diagnosed as Learning Disabled such as usually short
attention span, easily distracted, over active, tense or disturbed, poor drawing, poor handwriting, can’t correctly recall oral directions, left-right confusion, has trouble in telling time, poor organization of work, reverses letters, difficulty with arithmetic, omit words while reading etc. The problem behaviours included in the present study comes under

1. Problems in Academic Performance
2. Psycho social problems
3. Anxiety and
4. Problems in Perceptual & Motor Performance