CHAPTER-I
INTRODUCTION

Dysgraphia is not an indication of low intelligence. Many famous people like General George S. Patton, Albert Einstein, Louis Pasteur, Agatha Christie have struggled with the disability.

1.1 INTRODUCTION

Learning of academics is the core component of any school curriculum. For success in academic endeavors one has to acquire the basic components i.e. reading, writing, speaking, listening and spelling and in the formative stage the child acquires these components of learning. In the process of learning some students learn easily these components without confronting any difficulties whereas for some students it is a challenging and arduous task to have a mastery over these components of learning that leads to academic fiasco and maladjustment in school and home environment. When a child doesn’t seem to be learning, some teachers expel the child from classroom and parents criticize the child and think both of him/her as stupid, or may be just too sluggish to want to learn.

Sometimes there are apparently inexplicable blocks to learning which prevent intelligent children from reaching their potential in the classroom. There are up to 20 per cent of children not achieving the academic results that their intelligence indicates they should be capable of achieving. The blockages can be so difficult to ascertain that no one is aware of the real problem. Consequently, the frustrated and withdrawn behaviour which results is often blamed as the cause of the problem. Many times, the finger is pointed directly at poor parenting or poor teaching. What they don’t realize is that the child might have a learning disability.
In India, approximately 13 to 15 per cent of school age populations suffer from some form of learning disorders. Learning disabilities can affect a person’s ability in the areas of listening, speaking, reading, writing and mathematics and is often first suspected when there is a clear and unexplained gap between an individual’s level of expected and actual levels of achievement. Learning disabilities also can encompass problems in the area of social-emotional skills and behaviour, and some individuals with learning disabilities struggle with peer relationships and social interactions in addition to academic challenges. As a result, these children are branded as failures. With proper diagnosis, appropriate education, hard work and support from family, friends, teachers and others, a learning disabled can lead a successful and productive life. There are many programs, special schools and facilities, home teaching methods and many other ways in which children with Learning Disabilities can be helped.

Various plans and policies have been enacted to help learning disabled children in academic and personal life at International and National levels i.e., Universal Declaration of Human Rights, 1948 proclaimed the right of every child to education and is forcefully reaffirmed by the World Declaration on Education for All(1990). The Salamanca statement (1994) again proclaims that every child has a fundamental right to education and must be given opportunity to achieve and maintain an acceptable level of learning. This act further affirmed that children with special education needs must have access to regular schools, which should accommodate them within child centered pedagogy capable of meeting these needs. However the 86th Amendment, 2002 and article 21(A) of the Indian Constitution envisages that every child of the age six to fourteen years shall have a right to free and compulsory education in a neighborhood school till completion of elementary education. Provided that a child
suffering from disability either physical or sensory, as defined in clause(i) of section 2 of the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act; 1995 shall have the right to pursue free and compulsory elementary education in appropriate environment till eighteen years of age. Unfortunately, most schools fail to lend a sympathetic ear to their problems.

The nation's commitment towards achieving the goal of 'Universalisation of Elementary Education' remains unfulfilled and will remain elusive if educational opportunities are not extended to all school-going children including children with Learning Disabilities. Government of India envisages many policies and programmes at national level and state level through debates and deliberations for accommodating and rehabilitating learning disabled children in the classroom.

1.2 HISTORICAL BACKDROP

Most categories of special needs in special education have their roots in medicine. However, histories of Learning Disabilities reveal the origins in language and reading disorders emanating from neurological impairments. Among learning disabilities the study of Dyslexia is particularly important because it examines not only the neurological origins of reading problems but also the unexpected reading failure among average functioning students. Research investigations have demonstrated that language and perceptual processing deficits are contributors to the underachievement in reading. The late work of Strauss and Werner broadened the parameters to other academic areas, but all were still viewed within a medical model perspective. When LD was formally recognized as a category of special education, a tension arose between its medical origins and educational context. A medical model of LD is sufficient for conceptualizing the abstract nature of the condition but fails to
include real world contingencies like school. After all, students with LD are referred, diagnosed, and classified within the context of school. Thus, the field of medicine laid the foundation for LD but special education shaped its present form. LD was originally conceived as a discrete classification whose parameters included, not generalized learning failure, but particular problems related to academic learning. Thus, LD was created as a discrete category to describe academic problems, particularly underachievement, that resulted from specific deficits. Conceptually, LD differed from MR with respect to IQ level (LD is not associated with below average intellectual performance) and an ability profile indicating both strengths and weaknesses rather than the flat and depressed profile associated with MR. The focus on academic problems, rather than behavior problems, differentiated LD from Emotional or Behavior Disorders (E/BD). Thus, LD, as the newest category in special education, fit a niche by describing a classification of neurologically based learning disorders that resulted primarily from a variety of processing deficits. Thus, specific LD was a circumscribed category describing a particular form of underachievement and not a general form of low achievement.

A Learning Disability (LD) is a neurological disorder that affects the brain’s ability to receive, process, store and respond to information. The term learning disability is used to describe the seeming unexplained difficulty a person of at least average intelligence has in acquiring basic academic skills. These skills are essential for success at school and work, and for coping with life in general. LD is not a single disorder. It is a term that refers to a group of disorders.

Since the inception of the area of learning disability, controversy has raged over how learning should be defined. Of the many proposed definitions none has been universally accepted.
Different professionals from the different fields have tried to define the term in their own ways to suit their own purpose or to suit their own profession. Because of the continued problems in the definition of learning disability and lack of consensus among the professionals and a group of specialists from several organizations, a conference was convened for deliberations and discussions. This group of professionals and specialists included representations from American Speech-Language Hearing Association, Council for Learning Disability, International Reading Association, Association for Children with Learning Disability, Division for Children with Communication Disorders and the Orton Dyslexia Society, National Joint Committee on Learning Disabilities (NJCLD) and they with a combined effort generated a definition which speak, “Learning disability is a generic term that refers to a heterogeneous group of disorders manifested by significant discrepancies in the acquisition or 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 regulating behaviors, social perception and social interaction may exist with learning disability but do not by themselves constitute a learning disability. Although learning disability may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbances) or with intrinsic influences (such as cultural differences, insufficient or inappropriate instruction) they are not the result of these conditions or influences.”

The most commonly used definition, from the federal special education law, the Individuals with Disabilities Education Act (IDEA), uses the term **Specific Learning Disability (SLD)**. According to the IDEA, SLD is “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 the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.”

Learning disabilities are considered neurological deficits that interfere with the student’s ability to store, process, or produce information and that create discontinuity between one’s ability and performance leading to significant academic and social difficulties (Gettinger & Koscik, 2001; NCLD, 2002. Although a student with LD may have performance difficulties in one or more areas, such as reading, writing, spelling, arithmetic, listening, talking and social perception, these individuals generally have normal cognitive abilities (Culbertson & Edmonds, 1996; NCLD, 2002). Even though differences exist in the definitions offered by different individuals and organizations yet four common components are observed: ability-achievement discrepancy, psychological processes disorder, central nervous system dysfunction, and exclusion of other handicap categories.

The term learning disability can also be defined as a kind of behavioral deficit almost always associated with academic performance that can be remediated by precise individual instructional programming. Educationally, learning disabled is one whose achievement is less than his expected level of achievement. Learning disability is not a disease, so there is no cure, but there are ways to overcome the challenges it poses through identification and accommodation.
In Indian context, LD has neither been included as a category of disabilities in the Person with Disability Act (1995) nor in the Rehabilitation Council of India Act (1992). It is paradoxical still today that though the professionals recognize and acknowledge the existence of LD in children, there is a persistent denial to accept it as disability.

1.3 CHARACTERISTICS OF CHILDREN HAVING LEARNING DISABILITIES

Perception

One of the most prominent characteristics of LD has been overriding concern with perceptual disabilities. It is believed that good perception is basic to academic success. Since information is gained primarily through the visual mode, deficit in visual perception would limit children’s learning. It has been traditionally held that students who have problems in learning to read exhibit difficulties in three specific areas—visual discrimination, visual sequencing, and visual memory. Their visual discrimination difficulty includes distinguishing between b and d, m and w, p and q, no and on, saw and was, and so on. Their visual sequencing difficulties involve an inability to remember the left to right order of letters in a word (e.g. had-hda, who-hwo, girl-gril, least-laest). A poor visual memory is thought to contribute to a student’s discrimination, sequencing, reading and spelling difficulties (Verma, 1997) because he is unable to develop a constant visual image that can be retrieved accurately and at will. Children with LD are reported to be more inattentive than their non-handicapped peers (Verma, 1997). It has been hypothesized that they have difficulty in picking out the important information to which they should be attending. They are found to be characterized with direction confusion, figure ground difficulties, inadequate visual synthesis & analysis and visual motor difficulties. Prasad and Srivastava (1992) reported that children who are poor in their perceptual skills are also inferior in academic performance.
Specific academic skills deficits

The students with LD exhibit deficits with basic academic skills such as reading skills, reading comprehension, writing, written expression, spelling, mathematical calculation, and mathematical reasoning.

Perceptual-motor impairments

The students with LD may have trouble in distinguishing shapes and sizes. He or she may have also difficulty with fine motor activities, such as writing, coloring and cutting. They may lack established handedness and may make letter, word, and/or number reversals.

Memory and thinking disorders

Learning disabled children have particular difficulty in coding linguistic information. Mehta (1994) indicated LDs children’s problems lie in their inability to encode verbally the remembered stimuli. Agnani (1994) found that children having difficulty in reading, show difficulty with decoding process; their limited decoding skills affected their reading comprehension. Ramalingam (1996) suggested that the difference between LD and NLD students is in the quality rather than the quantity of rehearsal per se. The students may be deficient in the use of strategies for memorization and haphazard in their approaches to learning. They may have poor language skills, which hinder memory, pose difficulty with short-term auditory and visual memory, and lack of awareness of skills and strategies needed to solve problems and perform tasks.

Information processing

Children with LDs show significant discrepancies within or between the basic information processing modalities and/or in behavioral central skills. They may experience difficulties at all or any one stage of information processing viz., input, process and
output. Ramalingam(1996) reported that students with LD process information more slowly, and do not discern the semantic content of that information as distinctly as their normal peers. Kaur(1992) studied the information processing characteristics of LD and NLD children studying in class III. The LDs and NLDs differed on auditory perception, visual perception, auditory recognition, visual reorganization, and recall of auditory stimuli and recall of visual presentation. A number of western investigators have found that the response time of children with LD is longer than that of non-LD children. Longer response time may be associated with slower pickup of information by the central processing system.

**Cognitive and metacognitive skills**

Cognitive development refers to the growth in a person’s ability to acquire, interpret, store, retrieve, and employ concepts & knowledge. LD students often fail to develop efficient and effective strategies for learning (Swarup, 1999). They may also evidence production deficiencies, i.e. fail to use the knowledge and strategies that they do have. Furthermore, many children with LD fail to develop age appropriate abilities with respect to planning, monitoring and checking their behaviors during learning. Finally, capacity limitations may accrue from inadequate automatisation of skills. Researchers have shown that students with LD lack effective, sophisticated cognitive and metacognitive strategies to promote successful academic performance (Mehta, 1994; Verma, 1997).

**Speech and language disorders**

The students with LD may have difficulty with the grammar (syntax), meaning (semantics), or social use (pragmatics) of language.

**Attention disorders**

The students with LD may have difficulty with concentrating and remaining "on task" consistently. He or she rarely finishes what is started, frequently jumps from one activity to another, and is
easily distracted by competing stimuli.

**Hyperactivity**

The student with LD has difficulty sitting still, is constantly in motion, is fidgety, and seems driven by an "inner motor."

**Impulsiveness**

The LD students often act without thinking, have poor planning and organizational skills, respond quickly and make many errors, and lack self-regulation skills.

**Emotional problem**

The LD student is moody and often isolated or rejected by his or her peers. He or she may have low self-esteem and is more likely to violate social norms. He or she may exhibit inappropriate ways of getting attention, elicits more negative reactions from others, and be lacking in social cognition skills. Also, he or she may have difficulty with reading nonverbal social cues and with motivation. He or she may be passive, rather than active learner.

**General coordination deficits**

The LD student may be uncoordinated and have difficulty with fine and/or gross motor skills (e.g. tying shoes, running, hopping, skipping), and depth perception.

**Neurological soft signs**

The LD students have poor fine motor coordination, balance, and tactile discrimination. The students may have strabismus and poor visual-motor coordination.

**Motivational Problems**

Many LD students experience significant affective and motivational problems. Each child comes to the classroom with a complex and unique set of personal and educational experiences. Each LD student experiences significant and often prolonged academic failure. The history of failure can have significant negative
influences on both general development and ongoing school performance. Students with LD lack the necessary motivation to succeed. They may attribute unnecessary experiences to their own inabilitys or successful ones to luck, rather than viewing these abilities and efforts as contributing factors to success (Verma, 1997). Learned helplessness may be a characteristic of this group of students, as they expect to fail and are dependent on other people to solve their problems.

**Social perception and social behavior**

Children with LD show more behaviour problems, display less social competence and often come from disadvantaged backgrounds, compared to their non-disabled peers. They show more negative and inappropriate types of social behaviour (Rodricks, 1994). These behavioral problems interfere with their relationship with peers, teachers and parents. Children with LD show a variety of behaviour problems both in and out of school. When confronted with failure day after day, many students begin to rebel and act out at school. Their parents and teachers often misunderstand these children, because they do have normal intelligence, they are frequently accused of being lazy or not trying hard enough to succeed at school. Arora(1995) found that many students with LD are not well accepted by their peers, have social skill deficits, and have difficulties making and maintaining friends. He found social deficit as characteristic of many students with learning problems. Students with LD view themselves as less academically able than their typical peer group. Rodricks and Arora(1995) reported that adolescent students with LD may lack appropriate social skills, may possess the skills but lack generalization abilities, i.e. be cognitively aware of an appropriate social skill such as conversational turn taking, but no transfer of this knowledge to different situations.
Frustration

Pandey (2000) reported that one of the most often found characteristics in LD children was frustration. The child who fails in school find himself not progressing so quickly as the other children and is apt to be disturbed by this lack of progress. However, if his increased efforts do not bring improvement, he soon may develop strong feeling of frustration and become convinced he is stupid or that something is wrong with him. When the child is called upon to perform he is likely to become tense and anxious, which serves to make his performance even worse. After a period of time the child may develop an aversion to reading or arithmetic and thus take every opportunity to avoid these painful encounters. As he falls further and further behind his peers, he loses much of his interest and becomes bored and inattentive as the classroom material become progressively more difficult and beyond his comprehension. Now the youngster may find himself in a serious predicament. His disability makes it difficult for him to learn; his slow progress is frustrating and dampens his enthusiasm; his diminishing motivation lessens his openness to new material and gives rise to behaviors that impair learning, such as lack of cooperation and reduced effort.

1.4 WORLDWIDE PREVALENCE OF LEARNING DISABILITIES

One major aspect of learning disabilities is how to determine its prevalence rate, because there is lack of consensus among psychologists and educationalists to define the term learning disabilities. Learning disabilities is by far the largest category of special education. More than half of the students identified by the public schools in USA as needing special education are learning disabled. In U.S. it is estimated that in public schools the prevalence rate of learning disabilities is 6 per cent of students of 6 to 17 years of age. Currently, almost 2.9 million school-aged children in the U.S. are classified as having Specific Learning Disabilities (SLD) and
receive some kind of special education support. However, considering the special education population alone, the specific learning disabilities category contains the largest number of children, between 52 and 54 per cent (Cramer & Ellis, 1996).

An examination of post secondary education in the United Kingdom revealed that students with learning disabilities represented 3.8 per cent of all the first year students (Higher Education Statistics Agency, 1999). In Israel, the Council for Higher Education reported that between 1.5 and 3 per cent of University students had learning disability (Margalit, Breznitz & Aharoni, 1998).

Reports from clinics and schools show that four times as many boys as girls are identified as having learning disabilities. However, longitudinal and epidemiological studies suggest that actually there may be as many girls with learning disabilities as boys (Lyon, 1995; Shaywitz et al., 1990; Shaywitz, Fletcher & Shaywitz, 1995).

1.5 PREVALENCE OF LEARNING DISABILITIES IN INDIA

It is a herculean task to ascertain the exact number of children having LD in India, as no National Census has been conducted. The Programme of Action (POA, 1992) has reported an extrapolated figure of the 1981 survey by National Sampling Organization (NSO) as 3.6 million children in the age group of 5-14 years having learning disabilities who need to be provided education in the school system. Rao (1987) stated that 6.94 per cent of the scholastic underachievers (age range 9-11 years) were learning disabled. Mehta (1994) reported 7.14 percent of LD in the age group of 8-11 years in English medium schools. According to Potdar (1995) 4.53 percent children with of LD were studying in Marathi medium schools.

Prasad Jeanne (1993) found 8-10 per cent of all school going children are dyslexic. Agnani (1994) reported reading disability
among 7.5 per cent of class II children. Sodhi estimated 10-12 percent of school going children to have some form of specific learning disability. In schools within Delhi, about 3 per cent out of 40 were found to have specific learning disability (Nakra, 1998). Lavakare (1998) reported that 2 per cent of the handicapped population showed learning disability.

1.6 TYPES OF LEARNING DISABILITIES

Learning disabilities can be of various types, depending upon the areas of difficulty. Adams(1971), Ayres(1972), Bains(1997), Barsch(1967), Bateman(1964), Frosting and Maslow(1973), Johnson and Myklebust(1967), Kirk et al. (1968), Luria(1980) and Meeker(1974) have enlisted the various subtypes of learning disabilities. These are given in the following section.

1.6.1 DYSLEXIA

Dyslexia, in the broadest sense, describes an inability to extract meaning from the written word. However, it is used most often to describe an impairment or loss of the ability to read owing to central nervous system dysfunction. Maturational delay and unusually slow development of the neuro-psychological functions essential for reading affect a dyslexic child. This developmental delay or impairment results in the inability to translate sounds into letter symbols and to comprehend written material. Many children with severe reading disabilities caused by perceptual linguistic distortions make reversals or mirror images of letters, words, and symbols—a condition considered a diagnostic sign of dyslexia. Dyslexic readers tend to have an inefficient visual memory system. This means they cannot recall the sequence of letters in words and this prevents their reading from becoming automatic. Gupta and Garg (1994) reported that dyslexic children are significantly poorer than normal children on reading skills. Unlike normal readers, dyslexics have difficulty in applying grapheme-phoneme correspondence, particularly in being
able to decode unfamiliar words. Gopalkrishan and Suganthi(1993) reported word recognition errors in children with dyslexia. Mispronunciation was observed in all students whereas 90 per cent had problems of substitution. Eighty five percent showed omission, 25 percent had problems of transposition (wrong order) and 20 percent had problems of insertion. This dysfunction may be acquired from traumatic brain injury, or it may be developmental in nature, stemming from congenital deficits (Gaddes, 1980). Johnson and Myklebust (1967) identified two sub types of reading problems based on deficits in the central auditory and visual processes prerequisite to reading. The visual dyslexic may exhibit visual discrimination difficulties, reversal tendencies, and visual memory disorders, while the auditory dyslexic is unable to relate visual symbols to their auditory equivalents and has difficulty synthesizing sounds into words. Myklebust (1978) adds to the list of subtype’s inner language dyslexia, in which the child can read the words but fails to understand their meaning, and inter model dyslexia, in which auditory and visual cognitive processes fail to work together. Boder(1971) suggests the existence of three sub types of dyslexia based on analysis of reading and spelling errors: dyseidetic or visual spatial dyslexia; dysphonetics or auditory dyslexia; and mixed dyslexia on the basis of a dichotic listening test . The ‘dyseidetic’ dyslexics (visual dyslexia) are better when they are presented auditorily than visually. The dysphonetics (auditory dyslexia) perform better when the matters are presented visually than auditorily. The visual dyslexic readers show a general tendency to use letter level receding strategy where as the diverse symptoms of auditory dyslexia may be viewed as consequences of a tendency to read words as a whole. The visual dyslexic is rather accurate word reader. S/he is just reading slowly, whereas ‘dyseidetic’ dyslexic reads relatively few words immediately, i.e. within one second. Visual
dyslexics use low level receding strategy for reading conventionally spelt (regular) words; they read conventional words more accurately than unconventional words. ‘Visual’ dyslexic is more skilled than ‘auditory’ dyslexic in phonetic analysis and synthesis of words. It has been reported that 2/3rd of the LD students suffered reading disorders or about 85% of those LD students have primary learning disability in reading and language processing. Dyslexia occurs in people of all backgrounds and intellectual levels. People who are bright can be dyslexic. They are often capable of or even gifted in areas that do not require strong language skills, such as, computer science, design, drama, electronics, math, mechanics, music, physics, sales, and sports. People with dyslexia can also have problems with spoken language, even after they have been exposed to good language models in their homes and good language instruction in school. They find it difficult to express themselves clearly, to fully comprehend what others mean when they speak. In addition, dyslexia runs in families, dyslexic parents are very likely to have children who are dyslexic. Some people are identified as dyslexic early in their lives, but for others, their dyslexia goes unidentified until they get older. Dyslexia can also affect a person’s self image. Students with dyslexia often end up feeling “dumb” and less capable than they actually are. After experiencing a great deal of stress due to academic problems, a student may become discouraged about continuing in school.

1.6.2 DYSCALCULIA

Dyscalculia is a disturbance of quantitative thinking stemming from dysfunction of central nervous system. The term precludes limited intellectual capacity, primary language disorders, anxiety, or poor teaching as causes of arithmetic failure. Kosc (1974) describes developmental dyscalculia as a disorder owed to heredity or congenital impairment of the brain centers that are the organic
substrates of mathematical abilities. In case of developmental dyscalculia, these abilities fail to develop within the normal limits of time and sequence. Kosc identifies specific disturbances that may be indicative of dyscalculia. These may occur in clusters or individually and include verbal disturbances in which students cannot designate numerals or mathematical terms by name; disturbances of visuospatial organization in which students are unable to manipulate objects abstractly to determine relative sizes, shapes, and amounts; disturbances related to reading and writing numerals and operational symbols; disturbances of concept formation in which students are unable to understand mathematical concepts and relationships among numbers; and operational disturbances in which students are unable to compute. Many dyscalculic children are deficient in visual-spatial organization and nonverbal integration. Some dyscalculics have disturbances in body image and lack a strong sense of direction (Badian, 1983). They may have disturbances in visual-motor integration, either for writing or nonverbal motor skills (Cohn, 1971). Students with dyscalculia are unable to align numbers in columns, reverse the number (write 9 as 6, read 23 as 32), may subtract the top number from the bottom number in a subtraction problem. Students misread mathematical signs or may forget to use decimals when necessary and also miss a step in solving a problem, such as they forget to add carried number in an addition problem. Young children with LD can have difficulty learning the meaning of numbers, trouble with tasks like sorting objects by shape, size or color; recognizing groups and patterns; and comparing and contrasting using concepts like smaller/ bigger or taller/ shorter. Learning to count, recognizing numbers and matching numbers with amounts can also be difficult for these children. School age children with dyscalculia struggle to remember and retain basic math facts(i.e. times tables) and have trouble
figuring out how to apply their knowledge and skills to solve math problems and teenagers and adults may have difficulty moving on to more advanced math applications.

1.6.3 ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)

Attention-Deficit/Hyperactivity Disorder (ADHD) children exhibit developmentally inappropriate levels of inattention, impulsivity, and hyperactivity (American Psychiatric Association, 1994). Children with ADHD display diminished persistence of effort or have difficulty sustaining attention to tasks with little intrinsic value, exhibit excessive motor and/ or vocal activity, and experience difficulty in inhibiting behaviour to situational demands (Barkley, 1997). Behaviour disinhibition exhibited by these children is the sine qua non of the disorder (Barkley, 1998). Behaviour disinhibition, over activity, and inattentiveness are the cardinal characteristics of this disorder, and these characteristics occur across a variety of settings (for example, home and school) with the magnitude of symptom presenting significantly fluctuating in different settings and with different caregivers (Barkley, 1998; Zentall, 1985). Research suggested that inability to sustain and regulate attention was the critical feature of this disorder, rather than hyperactivity (Douglas & Peter, 1979). Prevalence estimates of ADHD in school-aged children have ranged from a low of 1 per cent to a high of 12 per cent (Frick, Strauss, Lahey, & Christ, 1993). Boys are six to nine times more likely than girls to be diagnosed with this disorder (Barkley, 1998). Research has found that girls with ADHD are more impaired in their intelligence, less hyperactive, and less likely to exhibit other externalizing symptoms (like aggression, defiance, and conduct problems) and internalizing symptoms (like anxiety, depression, and withdrawn behaviors) than boys (Gaub & Carlson, 1997).
1.6.4 DYSGRAPHIA

Dysgraphia is one of the important subtypes of learning disabilities. The word “dysgraphia” was coined from the Greek words “dys” means not quite right, not as desired and “graphein” means the motor action of handwriting or of letters/ numerals that are written and used to describe a severe problem with handwriting. It also means writing is not quite well and not good enough and unable to put the thought in the written form. Like “dyslexia” (impaired reading), the term “dysgraphia” (impaired writing) is used differently by different people. Handwriting disability has undergone many changes in nomenclature over the years. Some synonyms includes: motor agraphia, developmental motor agraphia, special writing disability, specific handwriting disability, specific learning disability in handwriting and more recently, dysgraphia is a problem with writing process. Dysgraphia is the impaired ability to express ideas in writing (Gaddes, 1980). Children who have acquired a limited vocabulary, have poor reading skills, and have difficulty using grammar and syntax usually are unable to organize and translate their thoughts into writing. Written sentences tend to be short and concrete. Words are frequently omitted or poorly organized in the sentences; verbs and pronouns are misused, errors in grammar, capitalization, and punctuation are displayed (Johnson and Myklebust, 1967). Poor writers are more likely to produce shorter and less interesting essays; and they produce poorly organized text at the sentence and the paragraph levels. Furthermore, they are less likely to revise spelling, punctuation, grammar, or the substantive nature of their text to increase the clarity of their communication. Students with LD often experience difficulty when asked to plan, write, and revise an essay. In general, these students lack a basic knowledge about how to approach writing and the writing process as a whole. Scardamalia and Bereiter (1986) identified five areas of
competence that are particularly problematic for students with LD when developing an essay: (a) generating content, (b) creating and organizing structure for compositions, (c) formulating goals and higher plans, (d) quickly and efficiently executing the mechanical aspects of writing, and (e) revising text and reformulating goals. Students with LD also experience difficulty when attempting to generate content and organize a structure for compositions (Graham, 1990). This problem may be attributed to their under-utilization of strategies for retrieving useful information. Thus, these students frequently view a writing assignment as a question/answer task involving little preparation. When students with disabilities are given an opinion essay, they simply responded by writing "yes" or "no" (to agree or disagree), followed by a few brief reasons, and ended with no concluding statement. Graham’s study demonstrated that, once students with disabilities believe they have answered a question, they often abruptly end their composition without a summation of their point of view. The end result is that very little content is generated. Barenbaum, Newcomer, and Nodine (1987) noted a similar finding: that student with LD produced substantially shorter and lower-quality stories than students who achieve typically. In most essays that Barenbaum et al. examined, the students with LD failed to frame their stories to include all of the basic elements. Instead, they generated relevant information from memory without any self-regulation, resulting in essays that are generally less coherent and organized than those of their peers without disabilities (MacArthur & Graham, 1987). These problems can interfere with a student’s ability to express ideas. According to Individuals with Disabilities Act (IDA) Fact Sheet “expressive writing requires a student to synchronize many mental functions at once: organization, memory, attention, motor skill, and various aspects of language ability. Automatic accurate handwriting is the foundation for this
juggling act. In the complexity of remembering where to put the pencil and how to form each letter, a dysgraphic student forgets what he or she meant to express. Dysgraphia can cause slow classroom productivity, incomplete homework assignments, and difficulty focusing attention”.

Symptoms of dysgraphia can include poorly spaced and shaped letters; a child’s handwriting getting worse instead of better with practice and effort, poor pencil grip, complaints of pain while writing, letter reversal, a strong aversion to writing, and, of course, illegible or very messy handwriting. A child with dysgraphia is also very likely to have dyslexia. Because of this, it’s long been believed by the medical community that dysgraphia is also caused by the types of visual processing issues that cause the dyslexic brain to see letters incorrectly. This theory is supported by the fact that students with dysgraphia often have other fine motor delays, such as problems with tying their shoes.

1.6.4.1 TYPE OF DYSGRAPHIA

Dysgraphia can be classified in different way by different people. According to Deuel (1994) dysgraphia may be broadly classified into three types (Fig. 1.1).

FIGURE 1.1
I. **Dyslexic Dysgraphia**

In dyslexic dysgraphia the spontaneously written text of a child is illegible, especially when the text is complex. In this type of dysgraphia, the oral spelling of the child is poor, but drawing and copying of written text are relatively normal. Finger-tapping speed (a measure of fine-motor speed) is normal indicating the deficit does not likely to stem from cerebral damage. A dyslexic dysgraphic does not necessarily have dyslexia.

II. **Motor Dysgraphia**

The motor dysgraphia is due to deficiency in fine motor skills, poor dexterity, poor muscle tone or unspecified motor clumsiness. Motor dysgraphia may be part of the larger problem of motor apraxia. Generally spontaneously written and copied text of a child is illegible, oral spelling is normal, and drawing is usually problematic. Finger-tapping speed is abnormal. The child with motor agraphia has difficulty in copying. Letter formation may be acceptable in very short samples of writing, but this requires extreme effort and an unreasonable amount of time to accomplish, and cannot be sustained for a significant length of time. Writing long passages is extremely painful and cannot be sustained. Letter shape and size becomes increasingly inconsistent and illegible. Writing is often slanted due to holding a pen or pencil incorrectly. Letters are "tremulous and malformed," yet oral spelling ability is intact. The areas causing motor agraphia are located "in the posterior portions of the second frontal gyrus of the adjacent cortex on the precentral gyrus (Orton, 1937)."

III. **Spatial Dysgraphia**

The spatial dysgraphia is due to a defect in the understanding of space. The child displays illegible writing, whether spontaneously produced or copied. Oral spelling is normal. Finger-tapping speed is normal, but drawing is very problematic.
Research on dysgraphia reveals that there exist many variations in its classification and subtypes. More commonly referenced resources divide dysgraphia into two classifications: specific and non-specific. Specific dysgraphia is attributed to spelling disabilities, motor coordination, and language disabilities. On the other hand, non-specific dysgraphia is traced to causes such as retardation, psychosocial insufficiency or poor attendance at school (Kay, 2004). Furthermore, additional research provides even further breakdown within classifications and subtypes. Gubbay and de Klerk’s research 1995 generated a list of variations which led to the identification of three-tiers of development dysgraphia related to language disorder (phonological, lexical, and dyslexic), non-language disorder (motor-apraxic, constructional-apraxic), and mechanical within their population of normal 13 and 14 years (Table 1).

1.6.4.2 UNDERLYING CAUSES OF DYSGRAPHIA

There are many causes of dysgraphia leading to variety of writing problems. Some experts believe that dysgraphia involves a dysfunction in the interaction between the two main brain systems that allow a person to translate mental image into written language (sound to symbol, as well as mental word to written word). Neurobiological factors are assumed to underlie some written expression disorder and other learning disorder cases. Neuropsychological research suggests that abnormalities in cognitive processes (e.g., visual-motor, linguistic, attention, memory) underlie learning disorders. All neurologists agree that a lesion in the one dominant brain hemisphere is sufficient to cause disorders of spoken and written language. Motor agraphia (handwriting disability), as a syndrome, rarely occurs in isolation because of overlapping of brain lesions and interdependence of functions (Orton 1937, 30-36). Although measurement of these neuropsychological process deficits is not universally accepted as reliable and valid; however, the
<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Dictation &amp; writing names of objects or actions</th>
<th>Can copy written words</th>
<th>Can copy mirror writing</th>
<th>Can copy diagrams</th>
<th>Mirror writing to dictation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aphasic agraphia</strong> (language Disorder)</td>
<td><strong>Phonological</strong></td>
<td>Cannot convert phoneme into grapheme</td>
<td>Phonologically incorrect misspellings</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Lexical</strong></td>
<td>Cannot learn or recall lexically(recognize whole word)</td>
<td>Phonologically incorrect misspellings</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Dyslexic</strong></td>
<td>Cannot convert grapheme into grapheme with strephosymbolia and graphical (lexical) error</td>
<td>Misspelling with reversals, omissions inversions and substitutions, non words and paragraph errors</td>
<td>Poor</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td><strong>Gerstmann</strong></td>
<td>Fluent incomprehensible order of letters and words</td>
<td>Misspelling with jumbled sequences</td>
<td>Poor</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td><strong>Semantic</strong></td>
<td>Retarded or aphasic subjects</td>
<td>Generally below average performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Apraxic agraphia</strong> (non-language disorder)</td>
<td><strong>Motor apraxic</strong></td>
<td>Poor penmanship as with clumsy child</td>
<td>Untidy with mild reversals, no paragrapha</td>
<td>Untidy</td>
<td>Untidy</td>
<td>Untidy</td>
</tr>
<tr>
<td></td>
<td><strong>Ideational apraxic</strong></td>
<td>Can copy; mild difficulty with dictation; cannot write names of objects or actions; cannot write spontaneously</td>
<td>Fair to poor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Constructional apraxic</strong></td>
<td>Visuospatial difficulty, cannot copy</td>
<td>Reversals and inversions; no paragrapha</td>
<td>Poor</td>
<td>poor</td>
<td>No</td>
</tr>
<tr>
<td><strong>Mechanical agraphia</strong></td>
<td>No cognitive dysfunction; mechanical problems with hands</td>
<td>Untidy</td>
<td>Untidy</td>
<td>Untidy</td>
<td>Untidy</td>
<td>Untidy</td>
</tr>
</tbody>
</table>
following subtypes of written expression disorders based on neuropsychological performance patterns may be useful to consider: fine-motor and linguistic deficits, visual-spatial deficits, attention and memory deficits, and sequencing deficits. Other studies have shown that split attention, memory load, and familiarity of graphic material affect writing ability.” Other causes are described below that corroborate with writing disabilities.

➢ **Sequential Causes**

Recent findings tend to support the idea that dysgraphia stems from sequencing delays instead- the brain has a difficult time for organizing all the different impulses it needs to send to the muscles in the hand in order for the individual to write. Other study also have indicated that perceptual problem (reversing letters/numbers, writing words backwards, writing letters out of order, and very sloppy handwriting) usually seems to be directly related to sequential/ rational information processing. These students often have difficulty with the sequence of letters and words as they write. As a result, the student either needs to slow down in order to write accurately, or experiences extreme difficulty with the “mechanics” of writing (spelling, punctuation, etc.). They also tend to intermix letters and numbers in formulas. Usually they have difficulty even when they do their work more slowly. And by slowing down or getting “stuck” with the details of writing they often lose the thoughts they are trying to write about.

➢ **Visual Processing Weakness**

It has been believed by the medical community that dysgraphia is caused by the types of visual processing issues that cause the dyslexic brain to see letters incorrectly. Although most students with dysgraphia do not have visual or perceptual processing problems, some students with a visual processing weakness often experience difficulty with writing speed and clarity
simply because they are not able to fully process the visual information as they are placing on the page. Again, this is probably the least likely cause of a written language problem. A visual processing weakness is sometimes referred to as a nonverbal learning disability and typically affects the areas of spelling and math much more than reading.

➢ **Auditory Processing Weakness**

Some students can also experience writing difficulty because of a general auditory or language processing weakness. Because of their difficulty in learning and understanding language in general, they obviously have difficulty with language expression.

In addition other factors inhibit writing skill development that may include head trauma, some types of diseases or brain damage, brain lesions, genetic defects, visuomotor, orientation difficulties, limited instruction, poor oral language abilities, specific cognitive deficits, limited cultural experiences, delayed neural or motor development, emotional problem, stress, first generation learners, child rearing practice, socio-economic condition, parents’ education and poor motivation.

Dysgraphia, handwriting disability, may exist in isolation but more commonly occurs with other learning difficulties, like dyslexia, aphasia, dyscalculia, and attention deficit disorder with or without hyperactivity. Handwriting disabilities fall under the federal IDEA-Individuals with Disabilities in Education Act (amended 1997). Students with handwriting difficulties are eligible for special education services under R340.1713-SLD-Specific Learning Disability in Handwriting. Federal Law PL 94-142 guarantees a free and appropriate public education in the least restrictive environment, nondiscriminatory assessment, and individual education programs for children with disabilities between the ages of 3 and 21 (Clark and Starr 1996, 302). To the maximum extent possible, disabled students are to be educated in regular education
classrooms, so that all students reap the academic and social benefits of typical education within a normal yet diverse peer group that represents the dynamic composition of the workplace and the cultural diversity experienced in adulthood. In contrast, in India, Learning Disabilities have neither been included as a category of disabilities in the Person with Disability Act (1995) nor in the Rehabilitation Council of India Act (1992). Hence, no such provisions have been made to develop their potentialities. But gradually awareness towards these types of disabilities is increasing and in near future it may be acknowledged by PWD and RCI act.

At least 10 per cent of the general population has some difficulty in acquiring written language skills (Rome & Osman, 1985). Boys are more prone than girls to handwriting fluency problems in elementary (Berninger & Fulter, 1992) and junior high school (Berninger et al., 1996). Berlinger and Hart(1992) reported about 1.3 per cent to 2.7 per cent of 300 primary school children having problem with handwriting, 3.7 per cent to 4 per cent having problem with spelling and 1 per cent to 3 per cent having problems with written narratives. Hooper et al. (1993) reported significantly higher rate of written language problems in a large epidemiological sample of middle school students. Using the Test of Written Language-2 Spontaneous Writing quotient, Hooper et al. reported about 6 per cent to 22 per cent of the middle school students exhibited significant writing problems(i.e.>2 standard deviations below the test mean) depending on region of country, gender, and ethnic status. The National Center for Education Statistics (1999) stated that only 23 per cent of fourth graders could write at a proficient level or above, 61per cent wrote at a basic level and 16 per cent wrote below the basic level (Fig. 1.2). Bernstein (2008) is of the view that 6 per cent of the school age population has a disorder of written expression. In India no national survey has been conducted so far about the prevalence rate of dysgraphia.
Source-National Center for Education Statistics (1999)

1.6.4.3 BASIC PROBLEM AREAS IN WRITTEN LANGUAGE

1.6.4.3.1 HANDWRITING

The first most generic problem manifested by students with dysgraphia is the handwriting problem. Handwriting is a complex human activity that entails an intricate blend of cognitive, kinesthetic, perceptual-motor components (Bonny, 1992) including visual perception, eye-hand coordination, visual-motor integration, kinesthetic perception, motor planning, dexterity and manual skills (Tseng & Cermak, 1993). From the intention of writing to the actual movement execution, there are different processing levels such as semantic activation, syntax construction, spelling recovery, allograph selection, size control and muscular adjustment (Van Galen, 1991). Kinesthetic perception, the sense of movement and position, also appears to play an important role (Schneck, 1991). A writer with kinesthetic perceptual deficits produces inversion and distortion, yet this performance is not consistent across all types of task. Typically, performance is not impaired on tasks where motor transcription is
not required, such as spelling orally or composing words with alphabet block (Marcie & Hecaen, 1979).

Handwriting deficits have been referred to as visual motor integration problems (Johnson and Myklebust, 1967). According to them “there are many children who readily learn the auditory and visual aspect words but who cannot convert these aspects into motor patterns”. They also noted that the nature of written language disorders is symbolic, with a break down often occurring between the mental image of the word and the motor system. In addition to poor motor skills, handwriting problems may be due to directionality confusion or even to various motivational difficulties. Some children with handwriting deficits are unable to hold a pencil properly, while others have problems in writing certain letters. This difficulty is due to poor revvisualization of letter forms, poor motor coordination, poor visual-spatial judgment (Gerard and Junkala, 1980). **Fig. 1.3** describes poor positioning of the writing instrument (pencil held lightly between the thumb and first two fingers), paper (right hander paper slanted counter clockwise), arms (forearms on the elbow extended slightly), and body (hips touching the back of the chair, feet on the floor, torso leaning forward in a straight line) also affects the child’s ability to write particularly child with motor or sensory dysgraphia which are commonly prevalent in classroom which may be due to birth injury or prematurity.

**FIGURE 1.3**
Other common deterrents to legibility include poor spacing between letters and words, failure to connect lines within letters, failure to close letters (for example, O), not crossing letters (for example, X), failure to stay on a line and variability in size of letters.

The prevalence of handwriting difficulties or dysgraphia among typical school aged children varies between 10-34 per cent (Rubin & Henderson, 1982; Smits-Engelsman, Van Galen,& Michels,1995). The percentage of children with handwriting difficulties reported depends upon the extent of teacher awareness, as well as the type of evaluation tools that are available.

Dysgraphia or poor handwriting is a common complaint among children and adults with learning disabilities, appearing with or without other academic difficulties. Although poor handwriting may occur for children who have no discernible dysfunction in other areas, it is often associated with neurological, behavioral or medical conditions including Attention Deficit Hyperactivity Disorders (ADHD), cerebellar ataxia, epilepsy and leukemia (as a result of cranial radiation). **Fig. 1.4** illustrates the sample handwriting of boy with dysgraphia with severe perceptual-motor problems.

![Handwriting sample of a boy with dysgraphia](image)

**FIGURE 1.4 Handwriting sample of a boy with dysgraphia**
1.6.4.3.2 SPELLING

Spelling disabilities are the second general type of written language disorder of students with dysgraphia. Many students who struggle with writing also have difficulties with spelling. Even if they are able to spell correctly on a weekly spelling test, when they think it may be very difficult to think of the correct spelling of the words they want. Some students then simplify their word usage. Other students just include the incorrectly spelled word. According to Johnson and Myklebust, “spelling requires more auditory and visual discrimination, memory, sequentialisation, analysis and synthesis, and integration simultaneously than perhaps any other skills”. In other words, spelling is most complex ability requiring an application and integration of phonological, orthographic, and morphological principles.

The abilities to read and to spell words share similar linguistic and cognitive processes, but spelling is far more complex. Spelling skill is based primarily on the application and integration of phonological, orthographic and morphological principles. One of the skills or tools that children must have in order to express their written ideas is spelling. Before they can write a sentence spontaneously, they must be able to spell some words from memory. Pre requisites are necessary in order for children to spell a word (Cicci, 1980). They must say the word correctly or remember its spoken pattern. Depending on the words, they must remember the auditory sequence of its phonemes or syllables or the visual sequence of its letters. They must be able to retrieve the motor pattern for writing the word and to execute the motor act. And they must be able to retain the word, not only for a weekly spelling test but also for later use.

Spelling difficulties persist among learning disabled children long after they have mastered the code for reading. Spelling problems
for some children and adolescents stem from their learning problems. Others reportedly never have difficulty with reading but fail in spelling and become frustrated when attempting any written task. As with handwriting, a lack of automaticity with spelling processes can inhibit the quality and fluency of written expression. Problems with spelling may interfere with both the amount and the quality of writing. If a writer has to stop to think of how to spell a word while composing, he or she may forget already developed ideas (Graham, Berninger, Abbott, & Whitaker, 1997).

1.6.4.3.3 WRITTEN EXPRESSION

The third type of problem confronted by students with dysgraphia is written expression problem. An individual’s ability to express thoughts, ideas, and feelings in writing, can be called as written expression. The first two aspects of written language i.e., handwriting and spelling are pre requisite to the development of adequate written expression. Once the student can write and spell with at least moderate success, s/he learns to use the abilities to express thoughts, ideas, or feelings in smoothly manner. Then, in addition to learning the rules of punctuation and grammar, the student learns to convert thoughts and ideas (which he can express orally) to the written form. Johnson and Myklebust (1967) suggest that the following sequence may be of value when a learning disabled student is having little or no success with writing but is able to discuss various topics successfully. Many learning disabled children are unable to utilize the written form of language as an effective means of communication. Some are unable to transfer ideas into written communication, while others make grammar and syntax errors (Myklebust; 1965). Most written expression deficits are found pre dominantly among young children beyond second grade. It is not unusual for many of these children to be identified as late as
secondary school because of the emphasis placed upon writing there.

A major difficulty experienced by the dysgraphic students with written expression problems is the inability to organize thoughts into the proper form for written communication. Many children who can orally articulate their thoughts concisely are totally unable to communicate in a logical writing style. Some children with written expression difficulties have trouble in expressing their thoughts in the correct syntactical and grammatical order. However, numerous syntax and grammar errors totally distort their written output. Johnson and Myklebust (1967) consider some of the more frequent written syntax errors to be word omissions, distorted word order, incorrect verb and pronoun usage, incorrect word endings, and lack of punctuation. The rule of grammar is also very confusing to many learning disabled children. The parts of speech, tenses, and the rules of usage are difficult to learn for the child with memory or conceptualization deficits. Some LD children have poor spoken and written language vocabularies because of the lack of various experiences (e.g. reading book, taking trips). Many LD children are unable to identify correctly or utilize commas, periods or question marks. Punctuation symbols are often confused with each other or not used at all. Some children with written expression deficits are unable to categorize or classify ideas in the proper sequence. The written communication of the children is usually marked by gross disorganization. Units of thought are completely scrambled throughout paragraphs and even within sentences.

1.6.4.3.4 NOTES TAKING

Another acute problem of students with dysgraphia is notes taking abilities which is challenging for them. Taking notes in class can be a challenging task for almost any student. As students progress through school, in class notes taking demand become
increasingly challenging. They are required to listen to information dictated by their teachers, process that information, and rewrite it in their own words in the form of easy to read notes. Without use of proper strategies, this multi-step process can be frustrating and overwhelming for most students. This skill is especially important in class, when teacher often speaks quickly and transmits an overwhelming amount of information that students must comprehend and jot down. Some students with LD, however, have particular difficulty with this skill. Students with dysgraphia or auditory motor difficulties struggle with this task.

Students with auditory motor difficulties omit letters, words and sentence while they write from dictation. Instead of writing correct words, they write other words or add letters to words due to the auditory perception problem.

1.6.4.4 REMEDIATION OF DYSGRAPHIA

Intervention is an overall effort make on behalf of the learning disabled children in order to minimize and remove learning difficulties by giving immediate feedback in the process of teaching-learning. The ultimate goal of intervention programme is to eliminate, or at least reduce the obstacles that keep a handicapped person from full and active participation in any line of endeavor. There are three basic kinds of intervention efforts: preventive (keeping possible problems from becoming serious handicaps), remedial (overcoming handicaps through education), and compensatory (giving the handicapped person new way of coping with his handicap). Preventive efforts are most promising when it begun early in life, even before birth in many cases. The new methods are devised for preventing handicaps such as genetic counseling and screening early in infancy for metabolic disorders. Remedial programme are supported largely in educational institutions and social agencies. In fact, the word remedial is
primarily an educational term; the word rehabilitation is used more often by social agencies. Both have common purpose to teach the handicapped person basic skills needed for independence. In school these skills may be academic (reading, writing, speaking and computing), social (getting along with other children, following instructions, schedule and other daily routines), or even personal (feeding, dressing, toileting without assistance).

Most learning specialists believe in a diagnostic-prescriptive approach, where the results of diagnosis (assessment) lead directly to a prescription (plan) for teaching. Ysseldyke and Salvia (1974) outline two major models of instructional remediation within the overall framework of the diagnostic-prescriptive approach. These models are referred to as the ability training model, and the skill training model. While there is not complete agreement among practitioners within either of the two models as what constitutes the single, best approach. Apart from two models developed by Ysseldyke and Salvia, for writing skills development of students with dysgraphia, the following models or strategies are also used.

1.6.4.4.1 STRATEGIES FOR THE DEVELOPMENT OF HANDWRITING SKILL

Handwriting is the complex skill which requires consistent intervention for development of various aspects of handwriting. The first step of handwriting intervention programme is not concerned about letter size; instead emphasis is on letter formation. For letter formation, letting the students scribble and draw on blank paper with easy to hold “fat” markers, crayons, or paintbrushes which allows them less pressure. Begin with lines and shapes, encouraging children to draw all vertical lines from the top to the bottom and bottom to top. All circular shapes should begin at the 2 o’ clock position, moving up, left, and around- like the letter “c”. Shapes using straight lines-triangles, rectangles, and squares should always
use individual lines that meet, not a single stroke with an attempt to make “pointy” corners. Every line should be drawn left to right or top to bottom. Vertical lines are drawn first, left side, then right side, and then the connecting horizontal lines. The horizontal lines on top are first, and all horizontal lines should begin at the left.

Handwriting programme also involves some activities i.e., Alphabet Warm-up, Alphabet Practice, Alphabet Rockets and Alphabet Fun. In **Alphabet Warm-up stage**, students learn the letters of the alphabet, identifying, sequencing, and naming them. Students practice four different tasks. The first task involves singing the alphabet song, while pointing to the corresponding letter on an alphabet chart. With the second task, the teacher says the name of a letter, and the student points to it on an alphabet chart. On the third task, the teacher points to a letter on an alphabet chart, and the child names the letter. For the fourth task, the teacher says the name of a letter and asks the child to tell what letter comes before or after it in the alphabet. For each task, the teacher provides feedback and assistance as needed.

**Alphabet Practice** the second activity employs an identical format for each unit. The alphabet practice lesson contains five stages. First, the teacher traces and describes aloud how to form each of the target letters (e.g., l, i, t), using flash cards with numbered arrows that show the order and direction of strokes for each letter (**model stage**). Second, the child imitates the teacher, tracing each letter, while describing how to form it (**imitate stage**). Third, the teacher and the child discuss how the formation of the letters are similar and different (**discuss stage**). Fourth, using a practice worksheet, the student practices each letter, tracing with a pencil a copy of the letter with numbered arrows, then tracing three copies of the letter without numbered arrows, followed by writing the letter three times within the confines of an outline of the letter, and
finally writing the letter three times on regular-lined paper (practice stage). Fifth, the child identifies and circles his or her best written letters (evaluate stage).

**Alphabet Rockets**, the third activity involves copying words and sentences that contain multiple instances of each of the letters for that unit (e.g., "Little kids like to get letters" for unit one on l, i, t). The child is asked to copy words and sentences, quickly and without making mistakes, for a period of 3 minutes. The number of letters copied is then counted and graphed on the first of three rockets on a performance chart. During the second lesson of each unit, the child again does Alphabet Rockets with the goal of beating his or her previous performance by 3 letters. The number of letters copied by the child is then graphed on the second rocket. If the goal is met, the teacher draws a big star above the second rocket to reinforce the child’s performance.

In **Alphabet Fun**, the fourth activity, the child learns how to write one of the letters in the unit in an unusual way (e.g, as long and tall, or short and fat), or to use it as part of a picture (e.g., turning an "I" into a butterfly or an "s" into a snake).

Next, teach the students lower case letters and upper case letters and short words in manuscript and cursive form. Once students’ form letters correctly, let them to do practice on paper with wide lined sheet in order to learn to control over size as well as to develop uniformity in size. There should be solid lines at the top and bottom, dotted lines in the middle, and space before the next line. Whether printing or writing in cursive, begin with paper that has a dotted middle line rather than using traditional notebook paper. The central line serves as an important guide and aids in faster achievement of uniformity of size. Before providing handwriting papers with variety width allowing them to write on blank paper which would provide guideline for selecting lines width. Write the
letter or words on the paper a few times for students to trace and then copy. For best results, handwriting practice should be scheduled for every day. It is also more effective to have two short practices a day then one long practice if the child becomes quickly fatigued when writing. Fine motor skills develop more slowly, especially in boys, than gross motor skills. Often boys fuss about paper and pencil work simply because their hands get tired. Be sure to have students sitting in a proper writing position. The flat surface on which their arms can rest comfortably should not be too high or too low, and their feet should be supported on the floor or on a box, rather than dangling. Handwriting practice consists of copying, not creating letters, words, and sentences.

1.6.4.2 STRATEGIES FOR THE DEVELOPMENT OF SPELLING SKILL

Spelling is one of the most common difficulties for students with Learning Disabilities (Bos & Vaughn, 2006). Therefore, students with learning disabilities require directed spelling instruction because they do not automatically discover spelling relationships through their reading. Spelling problems may be experienced for a number of reasons i.e. trouble recalling sounds of correct letters, difficulty in determining the sequence of sounds heard in a word, trouble recalling typical orthographic patterns, trouble recalling irregular spelling patterns or poor mastery/misapplication of rules. These problems can be overcome through a set of intervention programmes viz.-

(a) The Whole Word Approach

This approach requires the student to memorize the overall letter patterns of individual words rather than attending to the sounds and syllables within the word. The words are introduced to the student on flashcards with proper pronunciation and attention is drawn to particular features of these words. The students are
encouraged to make a mental picture of the words and examine these. With the eyes closed the students are then told to trace the word in the air. After few seconds the students write words from memory, articulating as clearly as he or she writes. These words are then checked against the flashcard.

(b) Linguistic Approach

Linguistic approach to spelling uses word families (brought, sought, thought) and also group meaningful speech units into a systematic instructional approach (for example, adding common prefixes or word ending to stems: un-, dis-, -s, -ed, -ing). Arranging words by their common spelling patterns have been found to be a beneficial instructional method (Hanna, Hodges, & Hanna, 1971; Lovitt, 1975). It enables the students with learning disabilities to generalize these words form more rapidly to others that follow the same orthographic patterns.

(c) Multisensory Approach

The Fernald remedial strategy has been used successfully with students who have spelling disabilities. Student can use their senses (visual, auditory and kinesthetic) in acquiring the spelling of words they choose to learn. Writing words from memory is emphasized. Gillingham- Stillman method uses oral and written spelling approach as a means of teaching reading and writing. Emphasis is placed on listening to the words being pronounced very slowly and then determining which letter sound is heard first, second, third, and so forth. If the child misspells orally, then the teacher may write down the misspelling so that the students can read the misspelling and learn why it is incorrect. After oral spelling becomes accurate, the student locates a letter card for the first letter; then second letter card is found, and so forth. Oral spelling, letter by letter, accompanies writing of word.
Apart from these strategies, other intervention programmes are organized in a sequential manner for surpassing the spelling difficulties of students with dysgraphia. These are daily review of previously mastered spelling words and spelling through game like crossword puzzles, word lotto. Students are instructed to close their eyes, imagining how the word looks, spelling it aloud, and then writing it down. They might also choose the one word among several distracters that looks like it is spelled correctly. The greatest benefit is shown in spelling when the students are told to fold the paper into a five column and instructed to copy the word in the column 1, then fold over the paper and write the word from memory in column 2. Students are told to check the word against the model in column 1 and this process continues until the word is spelled correctly.

1.6.4.4.3 SELF REGULATING STRATEGIES DEVELOPMENT (SRSD) FOR WRITTEN EXPRESSION

Karen Harris and Steve Graham developed in 1989 an instructional approach now known as Self Regulated Strategy Development (SRSD). They started with the premise that all children and especially those who face significant difficulties in writing would benefit from an integrated instructional approach and also directly addressed their cognitive, affective and behavioral characteristics, strengths and needs (Harris& Graham, 1996). SRSD has been developed with the assumption that every child can write and validate a powerful strategy for planning, writing, revising, editing, and managing the writing process. In tandem with composition strategies, children develop self regulation strategies and abilities crucial to orchestrating the writing process including goal setting, self instructions, self monitoring and self assessment and self reinforcement. The strategy has made significant differences in children’s development of a variety of planning and revising strategies, including brainstorming(Harris and Graham, 1985); self monitoring (Harris et al., 1994); reading for information and
semantic webbing (Mac Arthur et al., 1996); generating and organizing writing content, using text structure (Graham et al., 1992); advanced planning and dictation (De la paz et al., 1997); revising, using peer feedback (Mac Arthur et al., 1991 and revising for both mechanic substance (Graham et al., 1995). SRSD leads to changes and improvements in four aspects of students’ performance that is quality of writing, knowledge of writing, and approach to writing and self efficacy (Graham et al., 1992).

The six instructional stages provide the framework for Self Regulated Strategy Development. The six SRSD stages are (i) development of background knowledge on the idea being considered (ii) discussion in students teacher conference and with the group (iii) modeling of writing process by the teacher (iv) memorizing the mnemonics like POW, 5Ws+2How, TREE(Topic, Reason, Explain/Examine reason & End), SPACE (Setting, Purpose, Action, Conclusion, and Emotions), and (v) supporting the idea and (vi) independently performing the writing exercise by using the strategies learned (Harris and Graham 1997).

**Stage I: Development of background knowledge**

This stage begins by a discussion on what the students already know about narrative essay or story and opinion essays, including the elements that are commonly found in such essays. This knowledge is considered as essential pre requisite to using the target writing strategy, for writing narrative essay or story and opinion essay or persuasive which serves as prompt for generating information to include in the outlines.

**Stage II: Discussion**

In the second stage, an individual conference is held with each student and discussion held POW and W-W-W, What=2 and How=2 strategy through mnemonic chart for writing story or narrative essay (Fig. 1.5).
POW
Pick my Idea
Organize my Notes
Write and Say More

W-W-W What=2 How=2
Who is the main character?
When does the story take place?
Where does the story take place?
What does the main character do or want to do; what other characters do?
What happens then? What happens with other characters?
How does the story end?
How does the main character feel; how do other characters feel?

FIGURE 1.5 POW, W-W-W, What=2 and HOW=2 Mnemonic Chart

In this conference, students are oriented with the acronym POW which gives like power to write an essay or story through planning, organizing and writing. In step 1, i.e., the “P” stage, the students prepare and list all the ideas. It is similar to a brainstorming process. Visual or graphic organizer is used in this stage by large circle for main ideas and small circles for supporting facts. In step 2, i.e., the “O” stage, students assemble and organize the information, including sequencing the ideas and the flow. Graphic or visual organizer helps a lot of students with dysgraphia for organizing and sequencing ideas on the basis of their beginning, main points and concluding statements. In Fig. 1.6 represents three main components of a paragraph, or story. There is top bun, or the introduction. There is filling, representing the internal or supporting information. The bottom bun represents the conclusion. In the first one, the student first draws a picture for the beginning, the middle and then the ending of the story. After that, s/he writes about beginning, middle and ending portion. In step 3 i.e., “W” stage the
students write finally the story or essay coupled with editing and revising.

**FIGURE 1.6 Hamburger Graphic Organizer for Writing Story or Essay**

The dinosaur graphic in **Fig. 1.7** represents the three main components of a paragraph, or story. The head represents the introduction, just as the head of the dinosaur leads him where he is going. The long neck represents the supporting details, as the dinosaur's neck supports his head. The tail represents the conclusion, or the ending.

**FIGURE 1.7 Graphic Organizer of Dinosaur**
Moreover, one of the most successful strategies for struggling writer is to use a visual organizer in the form of a frame. A frame presents the various components which are necessary and serves as a reminder to recall each step and to do the steps, one at a time. Two examples of a basic graphic frame are given in Fig. 1.8. In the first one, the student first draws a picture for the beginning, the ending and then the middle of the story. After that, he writes about his beginning, middle and end. In the Main Ideas and Details Organizer, the student writes the main ideas in the big boxes on the left and then supports each with details.

![Graphic Frame for Writing Essay or Story](image)

For writing story or narrative essay, the students are oriented W-W-W, What=2 and How=2 strategy with basic components i.e. Who is the main character, and who else is in the story? When does the story take place? Where does the story take place? What does the main character do or want to do and what do other characters do? What happens when the main character does or tries to do it, and what happens with other characters? How does the story end? How does the main character feel, and how do other characters feel? For writing expository or opinion essay, each student’s previous opinion essay is examined he/she has written, to determine the elements and to assess the quality of each element. Then they are encouraged
to self monitor, self assess and self record which would allow the students to monitor the components in their essays. The first step in this stage involves identifying the intended audience and reason for writing the paper. During the second step, each student develops an outline for his or her essay. This includes establishing the premise for the paper, generating ideas to support the premise, evaluating readers’ reaction to each idea, noting a conclusion for the paper, and determining how the argument will be structured or sequenced. The third step is a reminder to continue revising and improving the outline while writing.

Stage III: Modeling

In this stage, the modeling of each writing task is done involving goal setting, brainstorming, organizing and let the students derive the essential features, rationale and value of these processes. In the first lesson of this stage, the teacher models while “thinking out loud” the use of these processes to write a story. In writing a story, he sets goal, brainstorms and lists what he already knows and organizes his ideas. As he writes, he modifies his outline by adding, deleting, changing, and rearranging both ideas and categories. The series of lesson end with the introduction of mnemonic that act as prompt to set goals, brainstorm and sequence ideas when writing or doing other tasks involving planning. Mnemonic charts are used to introduce POW, W-W-W, What=2 and How=2, TREE and LIST (List ideas sequence them) in this stage.

Stage IV: Memorizing

During this stage, students memorize the strategies, the mnemonic POW, W-W-W, What=2, How=2 and TREE and several self statements they plan to use. Students practice on memorizing this information in pairs-typically by quizzing each other. Most students memorize the items easily, but some need additional practice and continue to work on memorization as they begin writing essays.
Stage V: Supporting

In this stage, students write stories by using POW, W-W-W, What=2 and How=2, TREE and LIST. The teacher collaboratively plans a story with each student, and makes sure the strategy and mnemonic are used appropriately. The mnemonic chart is set out to remind students to set goals, brainstorm, and sequence. Assistance in form of prompting, guidance and feedback and re-explanations are provided. After completing a story, each student is asked to determine which story elements are present in the story, evaluate their quality and determine if the goal(s) for the story has been met. At the end of each lesson, each student is provided an opportunity to apply POW, W-W-W, What=2 and How=2, TREE and LIST at home or school. Students also explain how the strategy is helpful and what modifications are needed to enable it to work.

Stage VI: Independent performance

After writing stories with assistance, each student is able to write story by using POW, W-W-W, What=2 and How=2, TREE and LIST without support of anybody in this stage. At this point, student plan and write stories independently. The teacher provides positive and constructive feedback as required. Homework continues and students evaluate their stories and reflect on the outcomes and relevance of using the strategy.

1.6.4.4.4. STRATEGIES FOR THE DEVELOPMENT OF NOTES TAKING SKILL

Taking notes in class can be a challenging task for almost any student. Some students with learning disabilities, however, have particular difficulty with this skill. Students with dysgraphia or auditory motor difficulties may struggle with this task. Thus, learning techniques or intervention programme simplify this process. This skill is especially important in class, when teachers often speak quickly and relay an overwhelming amount of information that
students must comprehend and jot down. Students often hear dates, names, numbers, and key names, and struggle to capture every bit of information in their notes, usually in the form of time consuming full sentences. Learning shorthand strategies can help students immensely for jotting down notes. Learning disabled students are usually taught following strategies in order to reduce complications in taking notes.

**Symbols**

Using symbols help students save time when taking notes. It can help them for quick writing and take up less space than the much longer words they represent. Some examples of symbols include percentage (%), question (?), number (#), and money ($). For practice, students come up with symbols for following words: and, equals, star, sun, and circle. They are dictated mock sentences including these words and have the student write each sentence using abbreviations.

**Abbreviations**

Abbreviations, or shortened versions of longer words, help students to breakdown words into smaller chunks of letters. Some examples of abbreviations include: Wednesday (wed), homework (hwrk), people (ppl) and school (schl). Students can freely make up their own abbreviations- there are no set rules for abbreviating most words! For example, he or she can choose to abbreviate therefore as thfr, maybe as mbe, or assignment as asmt. Students can be as creative as they like, so long as they remember what the abbreviations stand for.

**Contractions**

Contractions save students time by combining two words in to one shorter, more compact word. Some examples of contractions include: couldn’t stands for could not, he’s stands for he is, I’d
stands for I had etc.

**Type of notes**

Students with dysgraphia are oriented with column style and webbing style notes taking for easy writing notes.

**Column style notes taking**

Column style notes taking helps students to organize information that they hear into two different columns. The left column should be drawn 1/3 from the left side of the page, and the right column should be 2/3 from the right side of the page. The student should label the left column “main ideas” and the right column “notes”.

In class, when the teacher begins speaking, the only place on the page where the student should take notes is on the right side, under the “notes “column. During class, nothing should be written under the “main ideas” column on the left. When the students come home from school, he or she should re-read the notes and group different sections of letters into specific main ideas. For example, if the entire lecture was on World War I, the first part may have been about the causes of World War I .Thus, students would write “causes of world war I” on the left side of the page, under the “main ideas” column, next to the information corresponding to that section of the notes. The students would move through all of his or her notes in that manner, categorizing the notes into different main ideas. A sample of this style of notes taking might be as follows:

<table>
<thead>
<tr>
<th>Main ideas</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causes of WWI</td>
<td>Leaders’ aggression</td>
</tr>
<tr>
<td></td>
<td>Economic compromise</td>
</tr>
</tbody>
</table>
Webbing

Webbing is a great strategy for students who prefer a more visual technique for taking notes. To use this strategy, students first draw circle in the centre of their page. Inside that circle, they write the topic of the lecture. Next, they draw a line branching out of the centre circle. On the line, they write first section, or main ideas, of the lecture. They then draw bubbles branching out of that line containing important details which describe that main idea. Once the teacher has finished discussing that section, students draw another line branching out from the original centre circle. On that line, they write the next main ideas. They then draw bubbles branching out of that line with important details describing the main idea, and continue that pattern until the lecture is complete. Webbing helps students visualize information that they hear or read, and serves as a great tool for test preparation.

1.7 RATIONALE OF THE STUDY

Literacy is not a natural outgrowth from orality (Horwitz & Samuels, 1987; Kress, 1994; Olson & Torrance, 1981; Wood, 1998). Becoming literate in our society entails that children learn to exercise and control over the written discourse. Writing is a core element in the educational process right from grass root level and is acknowledged by most people to be fundamental for school success. Being an integral part of the school curriculum, it is also considered to be the key to innovation and change in the future (Kress, 1995). It seems that children’s first urge may be to write rather than to read (Clay, 1983) and consequently, writing comes more naturally than reading (Stallard, 1974). Writing serves as an
instructional tool as well as vehicle of self expression at the elementary level.

Learning to write is a complex and multifaceted process. Children learn and integrate a range of skills and gain an understanding of written conventions before they themselves can communicate in writing. Children think in abstract and communicate with a remote audience in written form with whom they do not directly interact or receive feedback. Written language, or the ability to express thoughts, and ideas in writing, is the identity of a literate person. Writing is used for effective communication in business and professions through letters, reports and books. Creative works of literature stimulate and enrich the cognitive process of human beings. But everyone in our society must have the rudiments of written language for activities of daily living. Just as reading is essential for minimal success, so is writing.

Writing represents a highly complex neuro-developmental process which requires multiple brain mechanisms and it involves gross and fine motor coordination, motor memory, and kinesthetic memory, simultaneous and sequential integration of attention, language, and higher cognition. The primary requirements for written language include an intact central nervous system, intact cognitive ability, intact language skills (both receptive and expressive), motivation, skill development, practice, and emotional stability. Secondary requirements for written language include concepts of organization and flow, writing skill, spelling skill, syntax and grammar knowledge, mechanics, productivity, accuracy, visual and spatial organization, simultaneous processing, revisualization, and automatization. It is also a complex cognitive and motor skill activity involving attention at multiple levels: thematic, paragraph, sentence, grammatical and lexical (Biggs, 1988). Written language is considered to be one of the highest forms of language. In the
hierarchy of language abilities, it is the last to be learnt. Abilities and experiences in listening, speaking, and reading usually precede the development of writing skills. Successful performance in written language depends on the prior acquisition of skills in oral language and reading and on the integration of skills in handwriting, spelling, punctuation, and capitalization.

Difficulties in any of these other language areas will certainly interfere with the acquisition of the written form of language (Johnson & Myklebust, 1967). Children with writing difficulties experience difficulties with fine motor control and hand eye coordination leading to problems with handwriting (Berninger et al. 1991). They may have problems with phonological coding and limited knowledge of grapheme phoneme correspondences leading to difficulties with spelling (Snowling, 1994). Children with various writing problems invariably experience spelling disabilities. Alternatively, they may have difficulties with the compositional aspects of writing such as the generation of ideas or the ability to structure text, or they may lack meta cognitive knowledge of the processes involved in writing (Englert and Raphael, 1988). Hagtvet (1993) noted that pupils experiencing writing difficulties were more likely to have uneven developmental profiles and display a range of difficulties. Overall, they produce less writing, with more inaccuracies, poor organization and weaker content (Tindal and Parker, 1991; Graham and Harris, 1996). A number of other factors are also related to written language disorders that include spoken language disturbances, auditory blending problems, visual discrimination difficulties, word analysis deficits, speech articulation problems, and various instructional factors.

Learning disabled students have been characterized as having severe and persistent writing problems (Graham & Mac Arthur, 1987). Graham and Harris (1989) noted that these students have
considerable difficulty in executing and monitoring many of the basic cognitive processes central to effective writing. In terms of generating content, students with LD produce written texts that are inordinately short (Deno, Marston and Mirkin, 1982; Nodine, Barenbaum, and New Comer, 1985). Learning disabled students write stories and essays that are shorter than those of their normally achieving peers. Nodine et al. (1985) reported that learning disabled students’ stories were on the average 54 words in length, while normally achieving children wrote stories with approximately 104 words. Limited fluency may be related to lower overall quality and content. Mac Arthur & Graham (1986) found significant correlations between length and story structure and measure overall quality. An additional difficulty exhibited by most learning disabled students involves the mechanics of writing. On both standardized tests and informal measures of contextual writing, these students demonstrate considerable difficulty in spelling words correctly or using proper punctuation and capitalization (Moran, 1981). Learning disabled students, however, tend to make more grammatical errors than their normal peers (Moran, 1981). These students struggle to write and consequently spend much more time than their normal peers on a writing assignment. Even so, they remember less: so much of their energy is spent on the process that they often do not learn or sometimes even process the content of what they are working on. For these students, there is an underlying reason that their papers are messy or that their speed is excessively fast or excessively slow. They are labeled as poorly motivated, careless, lazy or impulsive.

Learners with mild learning disabilities may have difficulty with any or all of these problems. Research has demonstrated that these pupils often use fewer and complex words than others in written composition(Poteet,1980) and are poorer at expressing
abstract reasoning (Myklebust, 1973). Despite instruction, these pupils often seem to ignore the conventions, of grammar, punctuation, and capitalization and to violate the rules of sentence structure; producing significantly more sentence fragments and/or run on sentences (Myklebust, 1973). Poor fine motor coordination likewise creates problems with handwriting for mildly handicapped learners.

Many students who struggle with writing also have difficulty with spellings. Spelling problems appear to be particularly pronounced among learning disabled students. Even if they are able to spell correctly on a spelling test, when they are thinking of content it may be very difficult to also think of the correct spelling of the words they want. Some students then simplify their word usage. Other students just include the incorrectly spelled word. A common complaint of students who struggle to write is that their hand gets tired when writing. This can be due to a variety of factors. Some of the most common factors are inappropriate grip, a very tight pencil grip, or inefficient writing posture. Some students may be able to copy and write single sentences with a fair degree of ease, but they struggle tremendously with paragraph writing. Some dysgraphic students have great difficulty with spelling especially if sequencing is a major issue for them. Additionally, many dysgraphic students experience Dyslexia, a sequential processing problem that affects reading and spelling. Creative compositions written by LD students frequently lack even the most basic story elements (Barenbaum, Newcomer & Nodine, 1987; Graham & Harris 1989; Nodine, Barenbaum, & Newcomer, 1985).

The writing problems of children with learning disabilities are commonly prevalent in every classroom and constitute approximately 15 per cent of the school population in India. If the problems of learning disabled children continue to persist and are
not properly addressed at the appropriate stage, their achievement would lead to academic retardation and maladjustment, which in turn may result in constant fiasco in academic endeavor and professional field in later life and resulting in stagnation and consequent high dropout rate. Thus, this leads to wastage of human resource and country’s national and economic development would go downwardly.

Hence, those pupils experiencing difficulties with learning to write respond to planned, targeted instruction, providing that intervention is early enough to avoid the impact of negative effects of failure (Tindal & Hasbrouck, 1991; Hagtvet, 1993). Research into writing is much more limited than reading (Cameron et al. 1996). In addition, most research has focused on theoretical aspects of Dysgraphia has neglected investigation of treatment options (e.g., Bub & kertesz, 1982; Ellis, 1988; Friedman & Alexander, 1990; Katz & Deser, 1991; Miceli & Silveri, 1985; Patterson, 1988; Rapcsak, 1997; Robinson & Weekes, 1995; Romani, Ward & Olson, 1999). And there is a lack of consensus about a model of writing development that can adequately guide teaching, assessment and curriculum planning (Applebee, 2000). Due to paucity of research in this area in India in particular and other countries in general, there is an urgent need of research in order to develop the writing skills of learning disabled children. It is in this background that the study has been planned.
1.8 STATEMENT OF THE PROBLEM

The problem investigated in the present study is stated as:

“Impact of an Intervention Programme on the Development of Writing Skills of Students with Dysgraphia”

1.9 OPERATIONAL DEFINITIONS OF THE KEY TERMS USED

1.9.1 INTERVENTION

Intervention consists of all planned attempts to promote the welfare of children with special needs. There are three broad types of interventions: preventive, remedial and compensatory. In the present study intervention is remedial in nature with special reference to writing skills development of students with dysgraphia. For the present study the various types of intervention programme viz. alphabet warm up, alphabet practice, alphabet rocket, multisensory strategies, multiple strategies, whole word approach, linguistic strategy, Self Regulated Strategy Development (developing background knowledge, discussing, modeling, memorizing, supporting and independent performance) have been used for the development of writing skills of students.

1.9.2 WRITING SKILLS

For the present study, writing skills of students with dysgraphia comprise handwriting, spelling, written expression and notes taking. Handwriting is the graphomotor skill by which children express their ideas in written form. It combines visual perceptual, visual memory and the motor coordination necessary for executing the act. It includes various components of handwriting of writing skills viz. alignment, letter spacing, word spacing, letter size, slant and line quality. In the present study handwriting component of writing skills means scores obtained by students with dysgraphia on handwriting component of writing skills test. Spelling skill means
ability to produce writing materials without committing error and word analysis skill. It includes the components of spelling of writing skills viz. number of correct and incorrect spellings. In the present study the spelling component of writing skills means the scores obtained by students with dysgraphia on spelling test. Written expression is the ability to express an opinion or argument in written form. It includes the various components of written expression of writing skills viz. organization, cohesion, originality, mechanic, language, narrative text structure and expository text structure. In the present study the written expression components of writing skills means the scores obtained by students with dysgraphia on written expression test. Notes taking is the ability to take notes when a teacher is dictating. It includes the various components viz. incorrect letters, incorrect words, missing words and correct sentences. In the present study the notes taking component of writing skills means the scores obtained by students with dysgraphia on notes taking test.

1.9.3 STUDENTS WITH DYSGRAPHIA

Dysgraphia is a problem with writing process. Dysgraphia is the impaired ability to express ideas in writing (Gaddes, 1980). Children who have acquired a limited vocabulary, have poor reading skills, and have difficulty using grammar and syntax usually are unable to organize and translate their thoughts in to writing. Written sentences tend to be short and concrete. Words frequently omitted or poorly organized into sentences; verbs and pronouns are misused; and errors in grammar, capitalization; and punctuation are displayed (Johnson and Myklebust, 1967). For the present study students with dysgraphia means learning disabled students having problems in handwriting, spelling, written expression and notes taking.
1.10 OBJECTIVES OF THE STUDY

1. To identify writing skills deficits (Dysgraphia) in children with learning disabilities.
2. To find out the prevalence rate of writing skills deficits (Dysgraphia) in children with learning disabilities.
3. To design an intervention programme for the development of writing skills of students with dysgraphia.
4. To implement the intervention programme for the development of writing skills of students with dysgraphia.
5. To evaluate the efficacy of the intervention programme in the development of writing skills of students with dysgraphia.

1.11 HYPOTHESES OF THE STUDY

1. The intervention programme will have a significant positive effect on the development of handwriting skills of students with dysgraphia.
2. The intervention programme will have a significant positive effect on the development of spellings of students with dysgraphia.
3. The intervention programme will have a significant positive effect on the development of written expression of students with dysgraphia.
4. The intervention programme will have a significant positive effect on the development of notes taking skills of students with dysgraphia.

1.12 DELIMITATIONS OF THE STUDY

The study was delimited to
1. Students studying in Public Schools of Gurgaon district of Haryana.
2. 30 students with dysgraphia only.
3. Students in grade seven only.