

## **CHAPTER II**

### **REVIEW OF LITERATURE**

#### **2.0 Introduction**

In the first chapter, rationale along with objectives and hypotheses has been given. The present chapter is devoted to aspects related to different writing skills and types of writing difficulties among dysgraphic children. For better understanding the researches have been classified under the caption as follows:

- 2.1 An overview of Learning Disabilities
- 2.2 Incidence And Prevalence of Learning Disabilities
- 2.3 Diagnosis or Identification of Learning Disabilities
  - 2.3.1 Diagnosis of Learning Disabilities
  - 2.3.2 Identification of Learning Disabilities
- 2.4 Screening and Assessment procedures for Specific Learning Disabilities
- 2.5 Causes of Learning Disabilities
- 2.6 Effect of Learning Disabilities on Children
  - 2.6.1 Psychological and Behavioural Effect of Learning Disabilities
- 2.7 Educational Provisions & Accommodations For Learning Disabilities
- 2.8 Competencies And Awareness of Teachers about Learning Disabilities
- 2.9 Attitude & Awareness of Parents about Learning Disabilities
- 2.10 An Overview of Dysgraphia
- 2.11 Types of Dysgraphia
- 2.12 Class Room Facilities for Children with Dysgraphia
- 2.13 Studies Conducted based on Sub Skills of Writing Skills under Dysgraphia
  - 2.13.1 Studies Conducted on Fine Motor Skills
  - 2.13.2 Studies related to Hand Writing Skills of Dysgraphia
  - 2.13.3 Studies Related to Spelling Skills of Dysgraphia
  - 2.13.4 Studies Related to the Written Expression Skills of Dysgraphia
- 2.14 Studies Related to Instructional Strategies to Tackle Dysgraphia
- 2.1 An Overview of Learning Disabilities**

“Learning disability is a general term that refers to a heterogeneous group of disorders manifested by significant difficulty in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span” (NJCLD, 1981).

“A learning disability refers to a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subject resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural and instructional factors.” (Kirk, 1962, *Educating Exceptional Children*, p. 263)

The definition of Learning Disabilities in the Federal Law (IDEA-2004) defined the term specific learning disability means a disorder in one or more of basic psychological process involved in understanding or in using language spoken or written, which disorder may manifest it self in imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations.

Carlson, Shirley (2005) depicted a two hundred year history of learning difficulties. There is a vast difference between a learning difficulty and a learning Disability. An individual with learning difficulty can learn using conventional teaching techniques while learning disability (LD) requires specialized interventions which depend on the type of disability. The most common forms of LD are dyslexia also known as word blindness, dyscalculia, dysgraphia, and short term memory dysfunction. LD can result from injury, it can be hereditary it can come in many forms. Although it is no longer considered a form of mental retardation, it is now known that true LD is directly related to some type of brain malfunction. They found that LD did not originate in the 1960s as some people believe but actually spans the time from Napoleonic reign to space age exploration. Scientists, researchers, and educators know quite a bit about LD now, but they still do not know nearly enough to help the multitude of individuals afflicted with those conditions.

John Elkins (2007), conducted a study on “Learning Disabilities”. He advocated an approach to support students who experience difficulties in learning particularly in the key areas of literacy and numeracy. In the state of Queensland, Australia, a distinction has been made between students experiencing learning difficulties and those who have learning disabilities. However government priorities for improved achievement in literacy and numeracy made schools focus on the performance of all low achieving students without regard to diagnostic category. Throughout this article the different yet convergent understandings of LD in Australia and the United States are tracked with suggestions made for the future research that avoid the problems of operationalising the definition of LD proposed by Keogh (1982).

Diagnostic and Statistical Manual of Mental Disorders (DSM)’s definition of Specific Learning Disorder (SLD) as given in the fact sheet of American Psychiatric Association, (2013) says that the diagnosis of SLD requires persistent difficulties in reading, writing, arithmetic, or mathematical reasoning skills during formal years of schooling. Symptoms may include inaccurate or slow and effortful reading, poor written expression that lacks clarity, difficulties remembering number facts, or inaccurate mathematical reasoning. Current academic skills must be well below the average range of scores in culturally and linguistically appropriate tests of reading, writing, or mathematics. The individual’s difficulties must not be better explained by developmental, neurological, and sensory (vision or hearing), or motor disorders and must significantly interfere with academic achievement, occupational performance, or activities of daily living. Specific learning disorder is diagnosed through a clinical review of the individual’s developmental, medical, educational, and family history, reports of test scores and teacher observations, and response to academic interventions.

The overview of Learning disabilities tells us the different connotations of Learning disabilities by Samuel Kirk (1962), Diagnostic and Statistical Manual of Mental Disorders (DSM), types of learning disabilities and the difference between Learning disabilities and Learning difficulties (John Elkins (2007), Carlson, Shirley (2005)).

## **2.2 Incidence and Prevalence of Learning Disabilities**

Balasubrahmanyam (2001) felt that the incidence of dyslexia would be less in India as those literate in Indian scripts, received intensive phonic training and that the Indian methods of writing (orthographic) were transparent. In USA approximately 10-30% of children have difficulty mastering the skill of writing and problems are most common among children with various disorders, such as ADHD, learning disabilities, and speech and language difficulties (Graham & Harris, 2005).

Karant (2001, 2002 & 2008) observed that we do not have a clear idea about the incidence and prevalence of learning disabilities in India (2001). The syllabic nature of most Indian language scripts have high grapheme-phoneme connection so it needs a low level of phonological awareness to read (2002). The conversational level of LD children could be adequate, though they may have specific delays in the acquisition on formal language assessment (2008).

Pati (2004) studied the magnitude and pattern of disability in a rural community in Karnataka. Study design is cross-sectional in the setting of two villages in the field practice area of Kasturba Medical College, Manipal and Karnataka. Participants are People between 5 to 60 years of age. Statistical Analysis used are Proportions, Chi-square test. Results show that the prevalence of disability was 2.02%. The prevalence was higher among females (2.14%) than among males (1.89%). The prevalence was higher in the 45-59 years age group.

Mogasale VV, Patil VD, Patil NM, Mogasale V (2011) studied the 'Prevalence of specific learning disabilities among primary school children in a South Indian city' A cross-sectional multi-staged stratified randomized cluster sampling study was conducted among children aged 8-11 years from third and fourth standard. A six level screening approach that commenced with identification of scholastic backwardness followed by stepwise exclusion of impaired vision and hearing, chronic medical conditions and subnormal intelligence was carried out among these children. In the final step, the remaining children were subjected to specific tests for reading, comprehension, writing and mathematical calculation. The findings were the

prevalence of specific learning disabilities was 15.17% in sampled children, whereas 12.5%, 11.2% and 10.5% had dysgraphia, dyslexia and dyscalculia respectively.

U.S. Census Bureau (NCLD, 2014) report the prevalence of LD by age group: „ Among school-age children, parents report an incidence of 2.2 percent (1.8 percent ages 6-11 and 2.6 percent ages 12-17). This differs significantly from the number and percentage of students being provided special education due to LD (2.4 million, 5 percent of school enrolment) in the nation’s schools. This could be a result of many parents who respond to surveys not acknowledging that their child has LD. The prevalence of reported LD is much higher among those living in poverty. For this group, among all ages over 5, the rate is 2.6 percent versus 1.5 percent for those living above poverty.

The incidence and prevalence of Learning disabilities in India by (Pati (2004), Mogasale VV, Patil VD, Patil NM, Mogasale V (2011), Sunil Thomas, Bhanutej and John, (2003) and USA (U.S. Census Bureau (NCLD, 2014) are reviewed. Even though we do not have an idea about the incidence and prevalence of learning disabilities in India (Karnath 2001) the syllabic nature of the Indian languages make learning easy.

## **2.3 Diagnosis and Identification of Learning Disabilities**

### **2.3.1 Diagnosis of Learning Disabilities**

Kusuma Harinath (2001) studied certain factors related to learning disabilities in English among school students. The objectives of the study were to develop diagnostic tests to identify reading, writing and spelling difficulties; to study the personality characteristics of students with learning difficulties and; to study the awareness of teachers and parents about learning difficulties. The study reveals that 1) boys experienced more reading disabilities than girls, 2) age and class had no effect, 3) community influenced on their spelling difficulties, 4) parents educational qualification influenced learning difficulties, 5) location of school influenced on the learning difficulties, 6) medium of instruction also influenced learning difficulties particularly spelling difficulties, 7) mass media has no influence, 8) parents income influenced learning difficulties but not writing difficulties, etc. Thus this

study delineates various factors related to learning difficulties in English among school students.

Wright and Wright (2008) suggested that diagnosing dysgraphia and related LD is important since without diagnosis, children may not receive early intervention or specialized instructions in all the relevant skills that are interfering with their learning of written expression, considering that many schools do not have systematic, instructional programmes in handwriting and spelling. It is also important to determine if a child with dysgraphia may also have dyslexia and require special help with reading or oral and written language (OWL).

### **2.3.2 Identification of Learning Disabilities**

Mock (2003) conducted a study on identifying students with learning disabilities. Research comparing statistical and clinical prediction has yielded relatively consistent results. Statistical prediction methods have proven more accurate than clinical method. "Reading Achievement" in combination with "Response to Instruction" was found to be satisfactorily significant predictor of clinical judgements at the whole sample level.

Bradley et al.(2005) pointed one of the problems of the SLD among students is that they often go unidentified until the upper grades and then are left struggling academically until the discrepancy becomes significant enough to warrant eligibility.

Johnson, Mellard, & Byrd (2005) noted that the dissatisfaction with the IQ achievement discrepancy model was the primary reason for the debate, research, and discussion about the definition and identification of students with SLD.

Leung, et.al, (2007) found that the early identification of children experiencing difficulties in learning is essential for timely and effective intervention. The aim of this study was to develop a screening instrument for identifying students with learning difficulties at the end of the first term of primary classes in Hong Kong. This study describes the development and validation of a 27-item checklist on 549 students. In addition, test-re-test reliability was assessed to be good. The checklist can be administered in 10

minutes for each students based on everyday observations of the students; no specific testing of the students would be required. A longer version with 97 items was also made available for teachers to conduct a more comprehensive evaluation of a child's performance.

Johnston and Rogers (2011) says that early identification of children with Learning difficulties is important in order to identify children who may be in need of specialized services or intervention. Second, pupils in standard three were chosen because many pupils have already formed and internalized most basic reading and writing skills to achieve substantially in their academic work. This made it easier to identify those with writing difficulties. Also, they are preparing to move to upper primary which is a further incentive for achievement.

The debate on what constitutes LD goes on (Johnson, Mellard, & Byrd, 2005) with clinical research is a better yard stick to identify than statistical analysis (Mock, 2003). Factors for LD (Kusuma Harinath, 2001) & SLD go unnoticed so left unattended (Bradley et. al., 2005). Early intervention is the key to success for children with SLD for timely and effective intervention (Leung, et.al., 2007, Cecilia Obeng, 2007), Wright and Wright (2008), Johnston and Rogers (2011).

## **2.4 Screening and Assessment Procedures for Specific Learning Disabilities**

The insufficiency of trained persons in the field of special education in India makes assessment a frustrating procedure for parents (Nakra, 1996; Birla, 2001; Banerjee, 2003; Shrinivasan, 2004; Times India Network, 2004, 2005) Standardised tools for testing are not easily available in India, nor are indigenous tools for identification of processing deficits, intelligence testing and testing for proficiency in reading and writing available. India has a multilingual and multicultural background. There are fifteen official languages, including English as official language which are recognized by the Indian constitution and these are spoken in over 1600 dialects. Additionally, an estimated 850 languages are in daily use (OCLC, 2004). The language of the testing instruments is occasionally unsuitable to Indian students who may not be proficient in English.

Kapur, John, Rozario and Oommen (1991) developed the NIMHANS Index for SLD, Level 1 for assessment of pre-academic skills for children between 5 to 7 years attention, visual and auditory discrimination, visual and auditory memory, speech and language, visual motor and language, writing and number skills. The Level II for Classes 1-7 assess the areas of attention, reading, spelling, perceptual motor, visual motor integration, memory and arithmetic skills. This battery of tests is usually used in conjunction with the Malin's Intelligence Scale for Children.

Diagnostic Test of Reading Disorders in English by S. Swarup and D. H. Mehta (1991) identifies and diagnoses the process deficits that cause disorders in both fluency and accuracy of reading. Perceptual and cognitive deficits among the special children are assumed to be the underlying causes for the reading and writing problems. This test identifies the said causes. This test is developed on children of 8-11 years of age.

Diagnostic Spelling Test by Raj K. Gupta and Susheela Narang (1991): This test helps to identify children who are dysphonetic or dyseidetic spellers. This test consists 35 items. It is standardized on 924 children from III and IV class and age range of 7 to 9½ years.

Jayanti Narayanan (1994) has developed grade level assessment tool for children with learning problems in such schools. Teachers can use or adopt these tests for testing children who fail consistently in one or more subjects. The Grade Level Assessment Tool (GLAT) helps primary school teacher to test his/her student while systematically making observation of the processing pattern in a child. She prepared a learning disabilities check list to screen and identify children with LD.

Smriti Swarup and Dharmishta H. Mehta(2000), prepared a Behavioural Checklist for Screening the Learning Disabled (BCSLD). It is a screening tool which advocates use of other diagnostic tools for the assessment and determination of learning disability in the child. The checklists consist of 30 items, positive and negative, to be filled in by the teacher. It covers eight areas, each representing a deficit in a particular ability, and gives us insight into the mental make-up, attempting to explain the reason

for the child's under-achievement. It has been standardized on 1000 children from ages 8-11 years. 300 teachers also constituted the sample.

De Week & Sovilla (2000), in a collection of papers discussed various theoretical, clinical, and assessment issues in reading and writing delays and disorders and a therapeutic method for remedying surface Dysgraphia, using "metagraphic explanations" with students with severe spelling difficulties.

Smriti Swarup and Dharmishta H. Mehta (2001), prepared a Diagnostic Test of Learning Disability (DTLD) The test diagnoses learning disability in ten areas-from Auditory/Visual Perception to Cognitive areas. It consists of 10 sub-tests. It is to be individually administered on the age group 8-11 years old. A deficit in any of the area or areas or a combination of any, would lead to a learning problem. The test was standardized on a sample of 1050 children with the age range of 8-11 years. Eye-hand Co-ordination, Figure Ground Perception, Figure Constancy, Position-in-Space, Spatial Relations, Auditory Perception, Memory, Cognitive Abilities, Receptive Language, Expressive Language.

Sankaranarayana (2003) used certain reading assessment tests like letter identification, word recognition and reading tests as well as tests used with children in the Western literature such as Rhyming, Torgeson Elision, Rapid Automated Name, Rapid Alternating Stimulus, Short-term memory for Digits, Conservation, Handedness and Vocabulary. They found that the best predictors of learning disability is from phonological awareness of children.

Njiiri (2007), in this study sought to identify the assessment procedures used in identifying learners with dysgraphia. For example, a teacher may use instructional materials to aid the learning of subject matter for a class. These instructional materials could include; power point presentations (visual aids), books, articles, drawings among others, also known as learning /teaching aids.

Konanthambigi and Shetty (2008) used the Behavior Checklist for Screening the Learning Disabled and Swarup and Mehta (1991) developed a scale at the Special Education Cell of the SNDT Women's University for teachers to identify learning problems in children.

Test of Written Expression by Sneha Bansal & Batani Devi (English): consisted of 42 test items that measure the written expression under four areas. They are 1. Capitalization and Punctuation, 2. Syntax, 3. Vocabulary & spelling & 4. Fluency. This test is standardized on children of 8-10 years.

Yadav and Agarwal (2008) developed a Learning Disabilities Scale consists of 19 questions in 5 areas namely Verbal disability, oral attention disability, writing disability, mathematical computation disability and written attention disability. They identified 2.25% of school children (8-10 yrs) as learning disabled in rural schools in Allahabad. They found more boys than girls (B=2.66; G=1.71) having a Learning Disability.

Sood, Vishal (2013), prepared a Construction and Standardization of Verbal Learning Disabilities Checklist for School Children. This checklist consists of 42 items, divided into four areas: I. Reading Disabilities, II. Speech & Language Comprehension Disabilities, III. Writing Disabilities, IV. Mathematical Disabilities. This checklist is standardized on children of primary, middle secondary, senior secondary and special Schools age range to 15 years.

The screening and assessment procedures are very important to identify LDs and SLDs. (Njiiri (2007), De Week & Sovilla (2000)). An indigenous screening and assessment checklist for children with learning disabilities in India is prepared by Jayanti Narayanan (1994), There are many assessment tools to measure Intelligence Test and General Mental Ability in Hindi, Gujarati, Marathi Bengali and Tamil. For the present study the researcher selected Jayanthi (NIMH) tool of screening and Assessment of LD Checklist. As there is no Dysgraphia tool tailor made for this study the researcher prepared a Dysgraphia Inventory to identify writing difficulties in children and a diagnostic test for grade level assessment of 4<sup>th</sup> and 5<sup>th</sup> classes.

## **2.5 Causes of Learning Disabilities**

There are various factors which are considered as the causes of LD. A number of studies have been conducted on the etiology of learning disabilities.

Snow et al. (1998-2000) identified several individual risk factors for L.D. family history of reading difficulties poor literacy skills either because of inherent cognitive limitation or home environment, poor literacy related cognitive. Linguistic processing especially phonological awareness, confrontational naming sentence, story recall and general language ability. A diagnosis of specific language impairment, hearing impairment and primary medical diagnosis in which reading problems tend to occur as a secondary symptom. Among the group factors listed as risk factors for L.D. is poor schools, low income and poor neighbourhood. These findings indicated the characteristic cognitive strategy behaviour of individual learners i.e. field independent works best when they are put alone in the learning situation and taught through semi inductive strategies. Some studies have, however not reported any significant differences between the sexes on the field independent and field dependent dimension.

De Salles and De Mattospimenta Parente (2006) studied about the relationship between reading and writing difficulties and neuropsychological associated factors. There are controversies around the hypotheses of a possible deviation or developmental delay. To analyze this, the present study compared the neuropsychological task performances of second grade children with reading and writing difficulties (n=14) with two groups: one contrasting reading and writing competence, but not age (n=15), and the other contrasting age, but not reading and writing competence (1st grade; n=9). The results showed that the scores of the second grade group with reading and writing difficulties were statistically lower to second grade children competent in reading and writing in phonological awareness, oral language and phonological memory, not differing significantly from the first grade group. Such findings favour the developmental delay hypothesis of these neuropsychological functions in children with reading and writing difficulties.

[Paracchini S](#), [Scerri T](#), [Monaco AP](#), (2007) in a study on 'The genetic lexicon of dyslexia' observed that the neurological basis for dyslexia, or reading disability, is caused in large part by genetic factors. Linkage studies have successfully identified several regions of the human genome that are likely to harbour susceptibility genes for dyslexia. In the past few years there have been exciting advances with the identification of four candidate genes

located within three of these linked chromosome regions: DYX1C1 on chromosome 15, ROBO1 on chromosome 3, and KIAA0319 and DCDC2 on chromosome 6.

Berninger VW, Nielsen KH, Abbott RD, Wijsman E, Raskind W. (2008), Gender differences in severity of writing and reading disabilities. Gender differences in mean level of reading and writing skills were examined in 122 children (80 boys and 42 girls) and 200 adults (115 fathers and 85 mothers) who showed behavioural markers of dyslexia in a family genetics study. Gender differences were found in writing. Boys and men were more impaired in handwriting and composing and spelling than were girls and women. Men were more impaired than women in accuracy and rate of reading passages orally, but boys were not more impaired than girls on any of the reading measures. Males were consistently more impaired than females in orthographic skills, which may be the source of gender differences in writing, but not motor skills.

Chandra Kala Singh and Bimla Dhanda (2008) studied on children with learning disabilities in relation to different ecological factors. This investigation was carried out in Haryana on 60 respondents from various schools of rural area of Hisar district, preferably students with low academic performance in the class responsible for disability among the children through self instructed interview schedule. It was observed that the parents who were not able to provide their children with good resources, proper care, academic and play material suffered from two or more learning disabilities. Parents also had opinion that due to lack of resources, education and motivation, they could not provide their children healthy environment for learning.

Krishna, Oomen and Rao (2008), aimed to examine the association between academic skill deficits and brain dysfunction in the form of the neuro psychological causing emotional and behavioural problems. It is found that these problems are non specific to academic skill deficits so it was concluded that they are the result of brain's dys function.

Sadasivan et al. (2009) compared the effect of phonological awareness intervention (PA) and neuropsychological intervention (NP) in two groups of 10 reading disabled children each (10-13 years). Both the treatment groups

showed significant improvement in their scores which was maintained three months after the intervention. Cognitive changes and phonological processing skills showed different outcomes in response to intervention.

Virginia A. Rauh, Amy Margolis (2016), conducted a study on the “Environmental exposures, neurodevelopment and child mental health - new paradigms for the study of brain and behavioural effects” concluded that Environmental exposures play a critical role in the genesis of some child mental health problems specially lead and pesticides and other neurotoxic exposures play a vital role on the mental health of a child.

Learning disabilities are caused by various factors. The pre natal factors like alcohol, tobacco, drugs, substance use by pregnant mothers, toxins and chemicals, environmental exposures (Virginia A et al., (2016), ecological (Chandra Kala Singh, 2008) neurological Del Castillo, et al, (2010), neuro psychological (De Salles and De Mattospimenta Parente, 2006). There is gender differences in writing of LD genetically ([Berninger VW](#), 2008), brain dysfunction (Krishna, Oomen and Rao 2008), genetic ([Paracchini S](#) et al., 2007), poor families, facilities in schools, neighbourhood & low income. Learning disabilities tend to run in families, but whether this is due to genetic factors or similar learning environments is yet to be determined (Hallahan & Kaffman, 1980).

## **2.6 Effect of Learning Disabilities on Children**

Kohli, Malhotra, Khehra and Mohanty (2007) studied 46 children using the NIMHANS Index of specific learning disabilities in the age group of 7 - 14 years with SLD. They were primarily boys who attended the outpatient service of the Child and Adolescent Psychiatric Clinic at PGIMER, Chandigarh. The children reported various clinical problems such as behavioural problems (60.9%), neurotic traits (54.3%), history of developmental problems (39.1%) and family history of learning. The specific errors in their reading and writing skills are difficulty in comprehension, omission of words, difficulty using phonetic cues, difficulty in spellings, tenses, mispronunciation, substitution of letters, illegible hand writing and visual spatial difficulties.

### **2.6.1 Psychological and Behavioural Effect of Learning Disabilities**

Kemp and Carter (2002) provided some insight into why students with LD may be experiencing lowered peer status and increased rates of loneliness and depression; they stated that isolation that students with LD experience may be due to some problematic development in their social skills. Thus, students with LD may be experiencing these social and emotional consequences because of their inability to socialize adequately.

Johnson (2005) suggests that about 30% of children with SLD have behavioural and emotional problems. Additionally, she suggests that those adolescents with SLD had high rates of depression and alarming rates of suicide.

Seetharam (2005) conducted a study on the social integration of children with mild and moderate disabilities in mainstream classrooms under Sarva Shiksha Abhiyan, Tamil Nadu. The findings are the disabled students at the primary level have scored more in peer group affiliation and academic performance than the disabled students at middle school level. ii) Psycho-physical developmental stages are significantly related to peer group affiliation and academic performance. Pre-adolescents have performed better than adolescents. iii) Family, annual income, social community status and categories of disability have significant effect on the peer group affiliation; peer assessed behavioural characteristics and academic performance. iv) Socio-metric status of the disabled students has significant effect on academic performance and all the components of peer behavioural assessment.

Thomson and McKenzie (2005) pointed out that overall any group of individuals will inherently view themselves as others view them. According to them, children with LD felt that they received negative reactions to their label. Thomson and McKenzie also found that half of the children in their study felt depressed as a result of having been labelled with a LD.

Emerson & Hatton, (2007) conducted one study in Britain found that children diagnosed with a LD were twice as likely to have a depressive disorder, six times more likely to have a conduct disorder, and four times

more likely to have an emotional disorder among other mental health problems.

Karande, et al. (2007) found that there is gap between diagnosis of children with SLD and /or ADHD. In a study of 50 children identified with the average age at which the children were diagnosed was 11.36 years (with a range from 7 to 17 years), while the average age at which the symptoms were seen in children was (with a range from 4 to 6 years). The delay being diagnosed with SLD and ADHD was nearly 6 years on the average.

Ennis and Jolivette (2012) identified 14 studies using SRSD with this population and 11 were implementing school-wide positive behavior interventions and supports (SW-PBIS). PBIS, described throughout this issue, is a three-tiered, coordinated model of support designed to prevent and reduce the occurrence of problem behaviours by providing support at universal, secondary, and tertiary tiers (Jolivette & Nelson, 2010). Two other studies reported individualized behaviour plans were in place.

The stress levels of children with LD are high (Thenmozhi and Pooja Agarwal, 2008) prone to mental disorders (Johnson (2005), Emerson & Hatton, 2007) as there is a link between SLD & ADHD (Crawford, 2007) in most cases a huge gap of year in recognising the symptoms and diagnosis of SLD & ADHD (Karande, et al. 2007). The low self esteem (Sheema Aleem and Lavanya Rastogi, 2007), lowered peer status (Thomson and McKenzie (2005) labelling makes them react negatively (Thomson and McKenzie, 2005) due to inadequate social skills in gaining peer acceptance (Kemp and Carter, 2002) which in turn depends on the socio economic status of the child (Seetharam, 2005). Behavioural plan by (Ennis and Jolivette (2012) showed marked improvement.

## **2.7 Educational Provisions & Accommodations for Learning Disabilities**

The management of SLD in the more time-demanding setting of secondary school scenario in India is based more on providing provisions rather than remediation.

Anita Julka (2005) in her study implied a need for convergence, capacity building at all levels and managing attitudinal barriers for facilitating inclusive education.

Madhuri Kulkarni et al (2006) concluded that the children with Specific Learning Disabilities who availed the benefit of provisions showed a significant improvement in their academic performance in the SSC board examination.

Kamala (2014), observed in her study on Specific Learning Disabilities in India: With all the Rights, Issues and Challenges, that people with Specific Learning Disability (SLD) still struggle to get their full rights and provisions in India.

### **Accommodations**

Gregg and Nelson (2012) conducted a meta-analysis on accommodations given to children with Dysgraphia to address whether test scores from accommodated i.e., extended time and standardized test administrations are comparable for transitioning adolescence with learning disability as compared to normally achieving peers, and found that the most common accommodation accessed by adolescents with learning disability is extended time.

The educational provisions and accommodations gained some ground of late with many states in India recognising the importance of providing proper education to children with learning disabilities. Still a lot more is to be done (Kamala, (2014). There is a significant increase in performance with provisions (Madhuri Kulkarni, 2006, Anita Julka, 2005). Extra time or extended time is very helpful of all the provisions (Gregg& Nelson (2012).

## **2.8 Competencies and Awareness of Teachers about Learning Disabilities**

A majority of schools in India are not equipped to deal with the special needs of the student with learning disabilities. Smith (2004) Lack of adequate attention to the quality of education, lack of necessary instructional materials, standardized assessment tools and teacher training in special education, may

lead these learners fail to obtain meaningful education. Proper interventions are necessary to enable them learn at their own pace.

Reddy (2004) presented that, in more than 50 percent of the aspects, the special school teachers' competency was low and moderate, whereas in all the competency aspects the normal school teacher's competency was low and moderate.

Kataoka, Mika; Van Kraayenoord, Christina E; Elkins, John (2004). In this study, perceptions of learning disabilities were obtained from 128 principals and 123 teachers in the Nara Prefecture, Japan. Teachers mainly indicated agreement on the factor of insufficient knowledge of and support for students with learning disabilities. Principals were more aware of governmental issues than teachers.

Khatib (2007) studied the General Education Teachers' Knowledge of Learning Disabilities in Jordan. Four hundred and five regular classroom teachers were taken as sample for the study who was teaching 1st to 6th grade students in 30 schools in 3 Jordanian districts. The findings of the study reveal that the teachers had a moderate level of knowledge of learning disabilities.

Njiiri (2007) study on availability acquisition and use of teaching learning resources in primary schools in Kiambaa Division reveals that the use of a range of instructional material is highly recommended for the purpose of instructing and reinforcing learner's knowledge that was previously acquired. Njiiri further states that it is difficult to convert new ideas and unfamiliar information by words alone. For words to have meanings they must either be related to personal experience or known concrete objects; therefore, aids serve to open up channels for communication of information and create a variety of sensory impressions.

Jyotsna Saxena and Shireesh Pal Singh (2008) studied on technical competency of different level teachers. Teaching competency of primary and secondary schools teacher on the basis of different levels like gender, medium and training. The study used normative survey method. 200 teachers as sample were chosen by stratified random sampling. As a data gathering

instruments self made questionnaires were used. Data were tabulated and analyzed by using mean, S.D. and critical ratio. It was concluded that secondary and trained teachers have good competency than primary and untrained teachers, while no difference found on the basis of gender and medium.

Wright and Wright (2008) says the learning materials such as worksheet, group activity, instructions, games or homework assignments all allow the teacher to modify assignments to best activate each individual students' learning style.

Ruthiri (2009) study on the availability of teaching /learning resources comments that unavailability of teaching/learning resources contributes to the low academic performance in KePE in Buuri Division, Imenti North District. Learning resources encourage the learners to talk and create free atmosphere where learners help each other and consequently improve their verbal communication.

Vander Hart et al (2010) says that the teachers fail to devote an adequate amount of time, as recommended, to teaching handwriting, and they limit to the extent to which they provide explicit instruction.

Children with disabilities are generally bright and creative (Yosimoto, 2000) There is every need to conduct training programmes to all the teachers in India in the techniques of teaching LDs (Saravanabhavan, 2010) as awareness programmes give effective knowledge to teachers (Selvakami, 2000). The limited involvement of teachers (Vander Hart et al., 2010), low competency and moderate knowledge levels of teachers at primary level (Reddy, 2004, Kataoka, Mika et, al 2004, Jyotsna Saxena and Shireesh Pal Singh , 2008, Khatib, 2007) the inadequate resources and material (Smith, 2004, Njiiri, 2007, Wright and Wright, 2008, Ruthiri, 2009), no prescribed teaching modules in B.Ed colleges on LD (Chatterjee and Madhusree, 2009) are responsible for lack of awareness on LDs in Teachers regular or special.

## **2.9 Attitude & Awareness of Parents & Public about Learning Disabilities**

The learning disabilities still goes undetected in India because of the lack of awareness in schools, parents and public.

Graham, Harris, & Larson (2001), observed that writing is a complex process, an admired skill, which involves planning content, selection, organization, sustained attention, revision and mastery of skills and these aspects were difficult for school going children.

Prema (2001) found that both children with writing disabilities and normal children committed errors in addition of letters, substitution, omission, insertion of words, detection of stressed and unstressed vowels.

Sreedevi and Mayuri (2006) conducted a study on the effects of child's learning disabilities on parents. To determine the effects of child's learning disabilities on parents. Ex-post facto research design was for the study. 60 parents of LD children (30 random sampling from associative + 30 children with specific LD) were selected by purposive random sampling from the cities (Hyderabad and Secundrabad) of Andra Pradesh. The data was subjected to multiple regression analysis. Results revealed that the major determinant factors of these effects were education of the child, family income, severity of learning problems, presence of associative disorders, approach coping, negative perception and attitudes towards LD children, remedial programme and disciplinary practices.

Saludes and Dante (2009) conducted a "Study on The knowledge and perceptions on learning disabilities in the cities of Region XI of the Philippines and a region in New York City, U.S.A". The objective of the study was to find out the knowledge and awareness on learning disabilities, and the level of perceptions on remediation program and treatment services given to them. The findings of the study reveals that the majority of parents, educators and the members of the local school board have low knowledge and awareness on learning disabilities.

Independent research conducted in 2013 in USA with the support and involvement of NCLD and others in the LD field identified a broad spectrum of

attitudes, beliefs, values and challenges among parents of children with learning and attention issues. It reports that 2,241 parents of children ages 3-18. Sixty-eight percent of these parents reported to have children with formally identified learning or attention issues and 32 percent of them suspected their child had learning or attention issues that were not formally recognized (NCLD, 2014). One in three parents (35 percent) are deeply struggling with their attitude toward and ability to cope with their child's learning and attention issues.

First of all, awareness of this difficulty in learning has to be increased and the topic of SLD should be compulsorily taught to Doctors, School Teachers, Counsellors and General Public (Karande, 2008). There are negative attitudes and beliefs in parents to accept LD (NCLD, 2012, 2013) and low level of knowledge and awareness about LD (Saludes and Dante, 2009) due to socio economic factors in India (Sreedevi and Mayuri, 2006). A marked acceptance is seen in parents of late in accepting the challenges of LDs in USA (GfK Roper, 2010).

## **2.10 An Overview on Dysgraphia**

The National Joint Committee on Learning Disabilities (NJCLD) defined LD as a neurological dysfunction that may be reflected in cognitive problems, such as understanding, reading, writing, and doing math.

In the early 2000s, Mason and her colleagues began a series of studies looking at the effectiveness of using SRSD instruction to teach writing and reading strategies congruently (Mason et al., 2006; Mason & Meadan, 2007). The two strategies taught in both studies with fourth- and fifth-grade students followed all procedures for SRSD instruction. The first strategy, TWA (Think before reading, think While reading, think After reading), is a multicomponent procedural facilitator that incorporates nine previously validated cognitive strategies into a framework for active reading comprehension before (think about author's purpose, what you want to know, and what you want to learn), during (think about reading speed, linking knowledge, and rereading parts), and after reading (think about the main idea, summarizing information, and what you learned) (Mason, 2004). The second strategy, PLANS (Pick goals, List ways to meet goals, And make Notes,

Sequence notes), provides strategies for developing personal product writing goals as well as methods for evaluating their performance (Graham, MacArthur, Schwartz, & Page-Voth, 1992). Three steps for writing are included in informative writing instruction: (1) Do PLANS, (2) Write and say more, and (3) Test goals. Using the notes written for the main ideas and details during reading with TWA, students complete PLANS by selecting goals for writing and revising an informative essay. Results of the two studies (noted previously) indicated that students improved performance in informative essay writing following SRSD instruction for TWA + PLANS. Results of both studies indicated that the effects were maintained in the year following instruction.

Schipani (2007) found that the Dysgraphia is a learning disability characterized by very poor handwriting and the kids who had disorder in handwriting were trouble in processing how to form letters on a page.

Olivia (2010) suggests that, diagnosing dysgraphia is rarely present in isolation so it is important to have a trained professional in the diagnosis of learning disabilities (LD) to test for it. The severity of dysgraphia varies and therefore, remediation should be tailored to a child's specific learning deficits and/or co-existing conditions. One child may need intense occupational therapy while another may simply need explicit handwriting instruction.

Rosenblum and Aloni, Josman( 2010)Dysgraphia is an LD; in which children with normal intelligence have difficulties in writing by hand and visulmotor deficiency. Dysgraphic children may have difficulty in required speed of writing and doing homework needs continuous long hours that result in unreadable handwriting.

Kusuki, Schwellnus, Llyas and Chau (2011), in a Study in Toronto, Canada reveals that dysgraphia has a profound impact on children's psychosocial development. Other studies have examined the nature and biomechanical underpinnings of handwriting difficulties in children with and without dysgraphia. While the majority of these studies have considered short handwriting activities involving a sentence or a paragraph, handwriting quality and speed are reported to vary with the length of the writing task. Further, it is suggested that the biomechanics of handwriting also evolve over extended

writing reports and that these changes may be distinct between children with and without dysgraphia.

Nicolson & Fawcett, (2011), say that dysgraphia is the term used by some professionals to describe this disorder of written expression and incorporates various aspects, including spelling and handwriting (which includes both *printing/manuscript* and *cursive writing*). They demonstrated, through extensive research, that dysgraphia reflects a lack of automaticity at the cognitive level.

Sessoms (2011), dysgraphia & learning disabilities affect children emotionally and academically. Children with dysgraphia have difficulty expressing ideas and completing assignment. Therefore, they often become frustrated with their inability to perform well academically and are being mischaracterized as lazy or unintelligent. Also copying text from the board can take more time for a child with dysgraphia. The child's inability to control and synchronize the functions needed for written language often results in poor grades children with dysgraphia can be overcome with anger and frustration leading to increasingly poor academic performance.

Dysgraphia is defined by(Graham, et, al 2001, Marentette, 2011, Nicolson & Fawcett, 2011, IDA, 2012) as difficulty in mastery of writing skills with an impact on the unreadable hand writing (Rosenblum and Aloni, Josman, 2010) reflecting the academic, emotional behavioural (Sessoms, 2011) and psychological implications (Kusuki, Schwellnus, Llyas and Chau, 2011), characterized by very poor hand writing (Schipani (2007). It is often co existant with other SLDs (Olivia, 2010) committing errors in writing (Prema, 2001).

## **2.11 Types of Dysgraphia**

Feifer (2001) categorized Dysgraphia into four subtypes

**Phonological dysgraphia**, that is “writing and spelling disturbances in which the spelling of unfamiliar words, non words, and phonetically irregular words are impaired”. These students tend to have trouble spelling by sounds and rely on the visual aspect of letters; therefore, because spelling is an auditory task, they will have trouble with spelling tests.

**Surface dysgraphia** where students have trouble with orthographic representations of words, which makes the student rely too heavily on sound patterns; the opposite of phonological dysgraphia.

**Mixed dysgraphia**, this type refers to students having trouble with mixing up letter formations and having trouble with spelling tasks, a combination of the first two types. Recalling letter formations is hard for these students to do because there are so many instructions or rules that they get confused and; therefore, have inconsistent spellings of words.

**Semantic/syntactic dysgraphia**, is a grammatical problem in which students have difficulty with how words can be joined to make complete and comprehensive phrases. In addition, children with dysgraphia usually have some type of problem with automaticity that interferes with the retrieval of letter formation.

## **2.12 Studies on Class Room Facilities for Children with Dysgraphia**

Dominica (2011) gave suggestions which can help children with dysgraphia in the classroom to learn better and progress in the academic field as follows: Sitting facilities such as tables and chairs should be adapted to the optimum height of the learner. Classroom environment should be comfortable and pleasant with adequate lighting. Writing materials be adapted to suit the learner such as use of weighted pens, pencils grippers, colour pens and markers and bold line paper (for larger letters). Teachers should be patient and give allowances to these learners to complete their written exercises. They should also find out which positions works best for the child in the classroom. Parents should be advised to talk to their child regularly and assist him/her in their homework. Teaching techniques should involve activities which develop eye-hand co-ordination and visual perceptual skills. Teachers should also use a multi-sensory approach in teaching which involves the use of all sensations including taste, smell, touch movement and vision. Children with dysgraphia need a lot of support when in school and teachers should understand when a child is having bad days and give the child option of the less stressful activities. Focus on the child's qualities and gifts and encourage other children to be supportive.

Langley (2012), says student's handwriting can improve. Teachers should give them frequent opportunities to practice handwriting. Provide practice that is not stressful but those with combined use of multi-sensory techniques and modifications and give the student plenty of time to work on it. Practicing is not effective if the student feels rushed. He suggested some methods that can be used to assist learners with dysgraphia in letter formation such as forming letters out of clay, use their arms to "draw" letters in the air and also use their bodies to make the shapes of the letters. This helps to build students' memory of the form that letters take. (These materials are mostly for young children/pupils who are below eight old). Use of mnemonic or other memory aid that might help the student remember the shape of a letter. Also, provide different types of writing implements and allow the student to choose the one she/he feels most comfortable to use.

### **2.13 Studies Conducted based on Sub Skills of Writing Skills under Dysgraphia**

Graham gave four separate and interacting functional language systems: language by ear (listening comprehension), language by mouth (oral expression), language by eye (reading comprehension), and language by hand (written expression) are the four basic components of a language associated with language development skills of children (Graham, Berninger, & Fan, 2007).

The present study is based on the four sub skills of writing as given below:

- Fine motor skills
- Hand Writing Skills
- Spelling Skills
- Written Expression Skills

#### **2.13.1 Studies Conducted on Fine Motor Skills**

Patnaik (2002) assessed the selective attention capacities of normal and learning disabled (LD) children. The sample consisted of 90 normal children and an equal number of LD children. The results showed that the LD children performed at lower levels on measures of selective attention at both receptive and expressive stages. Moreover, the LD children experienced greater interference in a Stroop Test compared to their normal counterparts.

With increasing age the LD-normal difference on physical match and interference measures of selective attention decreased, indicating a developmental trend. The LD children were found to significantly lag behind their normal grade-mates in their general selective attention capacity.

Filippos vlachos and argiris karapetsas (2003), in his study on visual memory deficit in children with dysgraphia 'evaluated the performance of a group of 48 Greek elementary school children aged 6.6 to 12.5 years diagnosed dysgraphia and a control group on the Rey-Osterrieth Complex Figure test. Analysis indicated that there were no significant differences between dysgraphic and nondysgraphic groups during the copying task but the dysgraphic group performed significantly lower during mnemonic reproduction of the Rey-Osterrieth Complex Figure. These results suggest that children with dysgraphia possibly suffer from cognitive difficulties that influence visual memory more than visual motor skills.

Mather (2003) used finger tapping and line orientation judgment to investigate brain processing differences in early adolescent good readers/poor spellers (Dysgraphia), poor readers/poor spellers (Dyslexia) and good readers/good spellers and revealed that individuals with Dysgraphia and Dyslexia share a left- hemisphere processing limitation and they benefit from finger tapping approach.

Kirsten Schuchardt et.al., (2008), examined the working memory functioning in children with specific developmental disorders of scholastic skills. Ninety seven second to fourth graders with a minimum IQ of 80 were compared using a 2\*2 factorial (Dyscalculia vs Dyscalculia & Dyslexia vs Dyslexia) design. An extensive test battery assessed the three subcomponents of working memory, phonological loop, visual-spatial sketch pad and central executive. Children with dyscalculia showed deficits in visual - spatial sketchpad, and central executive functioning. When controlling the influence of the phonological loop on the performance of executive, however, the effect was no longer significant. Although children with both reading and arithmetic disorders were consistently outperformed by all other groups, there was no significant interaction between the factors of dyscalculia and dyslexia.

Puranis & Lonigan (2012) investigated the writing difficulties of preschool children with oral language impairments and found that children with weaker oral language skills lag behind their peers with stronger oral language skills in terms of their writing related skills and the child's cognitive ability also had an impact on emergent writing skills, but it appears to be moderated by oral language skills.

Dinehart and Manfra (2013) examined whether the fine motor skills of over 3,000 preschoolers predicted their academic achievement in second grade. The study aimed to disentangle the effects of fine motor manipulation tasks, requiring preschoolers to build with blocks, weave string, lace beads and cut with scissors (among other tasks), from fine motor writing tasks, requiring them to imitate strokes, copy letters, numbers and shapes, and draw simple objects such as people and houses. The results indicated that although all fine motor skills in preschool predicted later achievement, fine motor writing skills in preschool were consistently stronger predictors of reading and maths achievement than fine motor manipulation tasks.

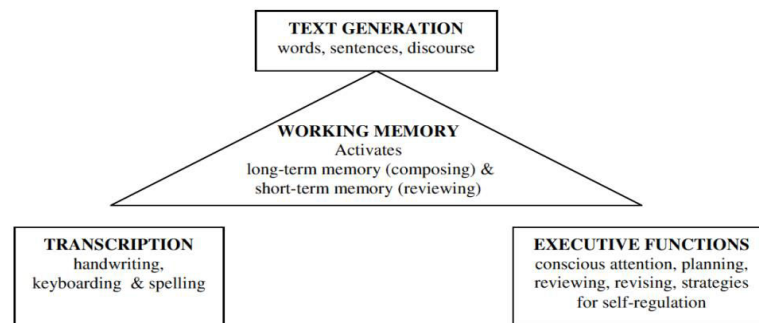
Studies on Fine motor skills reveal that the difficulty in writing is basically paying attention (Patnaik, 2002) fine motor coordination and visual motor integration (Volman, et, al, 2006) where fine motor skills (Dinehart and Manfra, 2013) and oral language skills (Puranis & Lonigan, 2012), visual memory (Filippos vlachos and argiris karapetsas, 2003), are better predictors of the LDs. Some interventions like finger tapping (Mather, 2003).

### **2.13.2 Studies related to Hand Writing Skills of Dysgraphia**

Graham et al, (1997) used multiple-group structural equation modelling to analyze the relationships between transcription (handwriting and spelling) and composition in 600 students, grades 1 to 6, who were virtually all general education students ( $N=599$ ) and right-handed (90%). The results of the model of compositional fluency showed that the relationship with handwriting and spelling were significant in the primary grades but in the junior grades only the relationship with handwriting was significant. In the second model, a model of compositional quality, only the relationship with handwriting was significant for all six grade levels. Spelling only contributed to compositional quality indirectly through its correlation with handwriting. Overall, the study showed that, due to

the large proportion of variance that was accounted for by a combination of handwriting and spelling in compositional fluency (41% in primary grades to 66% in junior grades) and in compositional quality (25% to 42%), the transcription skills necessary for writing affect students written composition throughout elementary school.

Berninger et al. (2003) developed a model of writing to address the developmental processes of how children learn to write, is referred to as the “Simple View of Writing”. It is illustrated as a triangle where *transcription* (handwriting and spelling) and *executive functions* (conscious attention, planning, reviewing, revising, strategies for self-regulation) are represented by the angles at the base and *text generation* (words, sentences, discourse) is positioned at the vertex of the triangle. Working memory (activating short- or long-term memory depending on the writing task) is considered to affect the whole writing process and this is represented by it being shown inside the triangle.



**Figure 2.1: Simple View of Writing Model (Berninger & Amtmann, 2003)**

Sara Rosenblum, Patrice L. Weiss, and Shula Parush, (2004) on Handwriting evaluation for developmental dysgraphia, Process versus product conducted a study with the objectives to compare the abilities of digitizer based evaluation of the handwriting process and conventional evaluation of the handwriting product to discriminate between children with proficient and dysgraphic handwriting. Copied and dictated writing samples were collected from 3rd grade students, 50 with proficient and 50 with dysgraphic handwriting. Results indicated that both digitizer-based and conventional evaluations differentiated between children with proficient and dysgraphic handwriting, and that together they provided an improved understanding of writing difficulties. Moreover, copying and dictated writing task results

significantly differed. The results demonstrate the advantages of combining both handwriting process and product testing, and utilizing both copying and dictation tasks, in order to achieve a more comprehensive understanding and superior evaluation of developmental dysgraphia.

Alyssa L. Crouch Jennifer J. Jakubecy(2007), in a study on “Dysgraphia: How It Affects A Student’s Performance and What Can Be Done About It”, applied two techniques, drill activities and fine motor activities, to find whether they help improve the handwriting of a student with dysgraphia. This action research used an ABAB single subject design to find which technique worked better over an eight-week period. The results were inconclusive on which technique worked better. However, the combination of both improved the subject’s handwriting and increased his score by 50%. Therefore, this study suggests that using both techniques can help improve the problems associated with dysgraphia, especially in the area of handwriting.

Puranik and Lonigan (2011) found that approximately 77% of the three-year-olds sampled in their study were able to produce some letters of the alphabet, and by age four and age five, approximately 93% and 95%, respectively, were able to produce letters accurately.

Richards et al. (2011) claim that hand writing is rather a “brain-based skill that facilitates meaning-making as writers externalize their cognitions through letter forms, the building blocks of written words and text”.

James and Engelhardt (2012) found that writing letters by hand activated areas of a child’s brain identified as the ‘reading circuit’. More specifically, writing letters activated those areas more so than other forms of sensorimotor training, including the tracing and typing of letters. The extent to which this activation influences development is unclear, but the authors concluded that handwriting certainly appears to lend support to the development of reading in young children.

Puranik and Al Otaiba (2012) found that handwriting and spelling were significant contributors to written expression in kindergartners. Four studies have provided a therapy assessed generalisation to spontaneous writing

(Carlomagno & Parlato, 1989; Hillis & Caramazza, 1994; Pound, 1996; Raymer et al., 2003). In each of these studies, changes were measured by asking participants to complete spontaneous writing or picture description tasks. Statistical analysis to show that improvements were significant in spontaneous writing.

The studies related to Hand Writing Skills focussed more accuracy in writing is with 3yr olds (Puranik and Lonigan, 2011) Proficiency (Kushki et al., 2011) and spontaneity in writing (Puranik and Al Otaiba, 2012) helps also in proficiency in reading (James and Engelhardt, 2012) by providing opportunities and activities (Langley, 2012) as it is a brain based skill (Richards et al. 2011). Drill and fine motor activities practice improved Hand writing (Alyssa L. Crouch Jennifer J. Jakubecy, 2007). Berninger et, al (2003) prepared a simple view on how children should write and both digitizer vs conventional evaluation (Sara Rosenblum, 2004).

### **2.13.3 Studies Related to Spelling Skills of Dysgraphia**

Graham (1999) states that an effective spelling program for students with LD includes 4 components. One, students with LD need to be taught how to spell words they commonly use when writing. Two, students with LD need to learn how to generate plausible spellings for unknown words. Three, students with LD need to know how to check and correct any misspellings that occur. Four, students with LD need to develop a desire to spell words correctly.

Stadie & Vijver (2003) examined the rehabilitation of writing to dictation of words with irregular phoneme-grapheme correspondence in words and to improve the spelling skills, two different intervention methods-rule based lexical information, lexical visual information of whole word forms were applied and the implications arising from the remediation study is that developmental surface Dysgraphia may benefit from training in rule-based writing even if the whole word approach fails.

Acosta (2005) conducted a study employing a mixed method, ex-post facto design to investigate which literacy instructional approaches and which related practices within the early grades of two-way bilingual education

programs influence long-term growth in the literacy achievement. The sample consisted of 300 students and 57 students in five two-way bilingual immersion programs in Houston. Results suggest that within an enriched, additive bilingual program, implementation of thoughtful professional judgments by well prepared teachers is more appropriate to bi-literacy development than the use of rigidly controlled instructional practices, restricted definitions of literacy, or a narrow focus on test scores.

Cooper (2005) conducted a study to examine the impact of the use of a on elementary students' ability to acquire and retain new and unusual vocabulary words within the prescribed visual arts curriculum and classroom. The second purpose was to examine the impact that the type of testing, either textual or visual, may have on the student's ability to demonstrate internalization of new vocabulary learned in a visual arts classroom. Results of the study revealed that student acquisition of the art vocabulary was significantly enhanced with the use of a dramatic activity during the visual arts class.

Schmalzl and Nickels (2006) used mnemonics to improve writing in a participant with impaired orthographic representations as well as a semantic deficit. The participant was instructed to copy high frequency irregular words and then to recall them after a five second delay. One of these conditions incorporated mnemonics and required the participant to recall an image associated with each target word, which was drawn as part of the word on the cue card. The findings showed significant improvement in spellings.

Bowes (2007) found that the bigraph biphone segment- blending approach improved both reading and writing abilities in an individual with phonological Dyslexia/Dysgraphia.

Nelson and van Meter (2007) measured spelling accuracy of the percentage of words spelled accurately compared to the TNW in narrative writing samples. They found that the group with learning disabilities had significantly lower spelling accuracy than their second- and fourth-grade TD peers.

Kikas, Eve, et.al (2008) explains the relationships among verbal skills of primary school students with learning disabilities and a typically developing comparison group were studied and compared with written tasks carried out in Estonian classrooms. Word defining, categorizing/justifying, guessing, and memorizing tasks were used. The participants were 251 students in Grades 2 to 4. Of these, 163 were described as achieving normally and were in regular education classrooms, and 88 were diagnosed as having specific learning disabilities and attended special schools or classes for students with specific learning disabilities. Except for performance on the memorizing tasks by grade, all the scores were better in upper grades. Children with learning disabilities performed less well than the children in the typically developing comparison group on all the tests.

Johns (2009) conducted a longitudinal study to examine the effectiveness of a non intensive spell study- spell intervention procedure-to compare the four sets of words trained, repeated, homework and control words at five evaluations baseline, during intervention, after the intervention, at six and twelve month follow up and at the end of the intervention, trained words showed small but statistically significant improvement relative to baseline and an advantage in accuracy over control homework and repeated word sets. The study also found that the behavioural intervention can provide with both immediate and short-term benefits for Dysgraphia in the context of primary progressive Aphasia.

Morgan Watson, et.al (2009) conducted a study to compare the effects of two corrective feedback methods, word-supply and phonics-based, on the oral reading fluency of students with mild disabilities. The participants included three students in the fourth grade who were diagnosed with a Specific Learning Disability (SLD) or Emotional and/or Behavioural Disorder (EBD). A single subject modified parallel treatments design (Alberto & Troutman, 2008) was used to evaluate the effectiveness of the two types of feedback methods (e.g., word-supply and phonics-based) on the students oral reading fluency skills. Dependent measures included the number of correct words per minute, recorded as a rate on 97 individual passages taken from levelled readers. Results of the fluency data collected on the errors corrected using either the word-supply or phonics based feedback method revealed that

the word-supply feedback condition was slightly superior for two of the three students.

Studies on spelling skills show errorful training (Raymer, Strobel, 2010) corrective feed back methods (Morgan Watson, et.al 2009), non intensive spell study-spell intervention procedure by Johns, (2009), bigraph biphone segment blending approach by Bowes (2007), mnemonics recall method by Schmalzl and Nickels (2006),dramatic vocabulary activity by Cooper (2005), ex-post facto design by Acosta (2005), phoneme-grapheme correspondence in words by Stadie & Vijver (2003) and Graham (1999) Spelling Improvement program improved significantly where as decoding and phonics approach by Savage & Higgs (2009), spelling accuracy measure by Nelson and van Meter (2007) showed average response to intervention.

#### **2.13.4 Studies Related to the Written Expression Skills of Dysgraphia**

The conventional methods of teaching grammar, like the Grammar-Translation Method, the Direct Method, the Audio-lingual Method and the Bilingual Method have been found to have their own advantages and disadvantages. These methods mostly treat the learning of English as a subject and not as a language. The importance of grammar may be disputed (Hillocks, 1986, Krashen, 1993, Truscott, 1996) but can never be discarded as its knowledge is fundamental to writing syntactically with hand or with computers.

Graham et al, (1997)used multiple-group structural equation modelling to analyze the relationships between transcription (handwriting and spelling) and composition in 600 students, grades 1 to 6, who were virtually all general education students ( $N=599$ ) and right-handed (90%). After implementing two, timed handwriting fluency measures (alphabet and copy task), three spelling measures (dictation and assessment of spelling in separate writing samples), and two composition measures (narrative and expository) the researchers developed two structural models. The results of the model of compositional fluency showed that the relationship with handwriting and spelling were significant in the primary grades but in the junior grades only the relationship with handwriting was significant. In the second model, a model of

compositional quality, only the relationship with handwriting was significant for all six grade levels. Spelling only contributed to compositional quality indirectly through its correlation with handwriting. Overall, the study showed that, due to the large proportion of variance that was accounted for by a combination of handwriting and spelling in compositional fluency (41% in primary grades to 66% in junior grades) and in compositional quality (25% to 42%), the transcription skills necessary for writing affect students written composition throughout elementary school.

Graham et al, (1997), the mechanics of writing in other words the lower skills of getting language on paper may interfere with both the quality and quantity of written composition. Automatic letter writing is the single net predictor of length and quality of written composition in younger children. It is estimated that 11-12% of female students and 21-32% of male students have handwriting difficulties (Rubin & Henderson, 1982; Smits-Engelsman, Van Galen & Michels, 1995).

Mackie and Dockrell (2004) studied written language in a sample of 33 children with a mean age of 11 years divided into three groups: those with specific language impairment (SLI), chronological age-matched (CA) peers, and language matched (LA) peers. The SLI group produced significantly fewer words than the CA group, but not the LA group. They used the Picture Story Language Test (Myklebust, 1965), a standardized assessment of writing that measures story content on a 5-point rating scale where better stories receive higher scores. They found no statistically significant differences between normal and Language Learning Disabled groups on content ratings.

Fey et al. (2004) compared story composition, collapsed across spoken and written modalities, across four groups of children in second and fourth grades, including an SLI and a TD group. The TD group demonstrated greater lexical diversity in NDW compared to the SLI group in both second and fourth grades.

Graham & Harris, (2005) say that approximately 10 to 30% of children have difficulty mastering the skill of writing and problems are most common among children with various disorders, such as ADHD, learning disabilities, and speech and language difficulties.

Konrad (2005) carried out a study to determine the effects of 'Go for it now Strategy instruction on writing skills of middle school students with disabilities. The findings indicated a functional relationship between the strategy instruction and students' abilities to write. The findings also showed improvement in the quality of students' paragraph writing skills.

Kiran (2005) reported in a study conducted on 3 people that one of her three participants did not improve significantly on writing to dictation, oral spelling or written naming, which she hypothesised may have been related to his impaired auditory processing. Children's improved ability to write letters and complete more complex writing tasks-such as spelling and the production of complete and meaningful sentences-requires a more integrated knowledge system including the symbolic nature of letters, letter-sound correspondences and knowledge of writing conventions.

Ferouhi (2007) conducted a study on written language difficulties in language-learning disabled (LLD) fourth and fifth graders. Forty students participated in the study. The participants were 21 males and 19 females, aged 9-11 years. They were tested using a battery of standardized measures compiled for the study, which assessed oral language, nonverbal IQ, reading, spelling and written expressions. Four groups were formed: Specific language impaired (SLI) Reading disabled (RD), specific language impaired with low reading performance (SLI-R), and typically developed (TD). Twelve (60%) of the LLD participants in this study were previously classified as language-learning disabled (LLD) by the school district's child study team (CST). Fifteen (75%) of the LLD Participants were classified as specific language impaired (SLI). Two (10%) of the LLD participants were classified as reading disabled (RD). Three (15%) of the LLD Participants were classified as specific language impaired with low reading performance (SLI-R). The TD group scored significantly higher than the participants in the LLD group on all measures, indicating that developmental difference exist between the two groups. In spelling the SLI and RD group showed difficulty with letter sound correspondence and orthography. In writing all the four groups showed difficulty with contextual conventions and contextual language.

Beeson, et al. (2008) conducted a study on: targeting single word therapy on lexical and phonological elements” on eight participants targeting Spelling of regular and irregular words and non-words with phonological treatment and interactive treatment (self-generation of phonologically plausible spellings and use of electronic spelling aid) found Significantly improved spelling of untrained regular and irregular words, but not non-words.

Bernstein (2008), proficiency in written expression skills can be viewed as the culmination of a child's education. The need to have clear handwriting is of utmost importance in today's society. Communicating ideas, writing and signing cheques, signing legal agreements and other daily activities need legible handwriting. One may argue that technology can replace the need for handwriting; however computers cannot be relied on for everything since there are many homes and work places that do not have computers and there are many instances in daily life when a computer is not handy because of power cuts or portability.

Kondrat (2009),commenting on writing skills argues that excellent writing is sure to earn respect while poor writing will be difficult to understand and will leave a bad impression about the individual. He further adds that, writing structures crystallizes one's thoughts and improves the effectiveness of the person's word usage in both oral and written expression. Referring to a survey conducted among 64 American Companies, It is found that half of them pay attention to writing when considering a person for employment or promotion.

Grissmer et al. (2010), found a significant association between kindergartners' fine motor skills and their academic achievement utilizing data from the British Cohort Study, but noted that copying an image involving various shapes, and utilizing a writing utensil, appeared to be a stronger predictor of academic success in middle school than other types of fine motor tasks.

Salis and Edwards (2010) treated the written production of transitive and intransitive verbs as well as subject-verb (SV) and subject-verb-object (SVO) sentences in a participant with moderate to severe aphasia and apraxia of speech. Verbs and sentences were targeted simultaneously within

sessions with a 'cue and copy' approach to treatment. In each session the participant was first asked to write the verb depicted in a picture and was provided with orthographic cues on failed attempts. The treatment resulted in significantly improved verb and sentence production, although the participant found transitive verbs more difficult than intransitive verbs.

Virginia W, Berninger and Robert D. Abbott (2010) studied Unique Language Systems on 'Listening Comprehension, Oral Expression, Reading Comprehension, and Written Expression: in Grades 1, 3, 5, and 7'. Age-normed tests of Listening Comprehension, Oral Expression, Reading Comprehension, and Written Expression were administered in grades 1 ( $n=128$ ), 3, and 5 or 3 ( $n=113$ ), 5, and 7. Confirmatory factor analyses compared one-and four-factor models at each grade level and supported a four- factor model of Language by Ear, Mouth, Eye, and Hand. Multiple regressions identified which of the three other language skills explained unique variance in each of the four language skill outcomes and provided additional evidence that language is not a single skill. Individuals' ipsative scores (amount that the standard score for age on each language measure deviated from individual's mean for all four measures) showed that 25% to 30% of individuals showed relative strengths or weaknesses (+ or - 1 SD) in specific language skills, but only 7% were stable across grades 3 and 5.

Anthony D. Koutsoftasa and Shelley Graya(2012) in a study on Comparison of Narrative and Expository Writing in Students With and Without Language-Learning Disabilities, used writing samples to compare how students with and without LLD scored on analytic writing measures that are typically used in writing research and on a more holistic measure of writing in Fifty-six 4th and 5th graders and the results demonstrated that the analytic scores of productivity, sentence complexity, and lexical diversity were correlated significantly with a higher overall score on the six-traits writing rubric (STWR; Education Northwest, 2006) for narrative writing samples only.

Young-Suk Kim et al., (2015) made a study 'Towards an understanding of dimensions, predictors, and gender gap in written composition' the data was from second and third grade students ( $N=494$ ). Data were analyzed using confirmatory factor analysis and multilevel modeling. Results showed that

writing quality, productivity, and CBM scoring were dissociable constructs, but that writing quality and CBM scoring were highly related ( $r=.82$ ). Language and cognitive predictors differed among the writing outcomes. Boys had lower writing scores than girls even after accounting for language, reading, attention, spelling, handwriting automaticity, and rapid automatized naming.

The review of the studies show that excellent writing (Bernstein (2008), commands respect (Kondrat, 2009) there are 10-30 % children in a school with writing problems Graham & Harris, (2005,1997) 11-12% of female students and 21-32% of male students have handwriting difficulties (Graham, Rubin & Henderson, 1982; Smits-Engelsman, Van Galen & Michels, 1995). boys had low scores than girls. Fine motor skills and academic achievement (Grissmer et al. 2010), verb and sentence production (Salis and Edwards (2010) written and spoken narratives (Behrns, Hartelius, & Wengelin, 2009), single word therapy (Beeson, et al. 2008), errorful training in relearning of words (Clare and Jones, 2008), go for it now strategy (Konrad, 2005) Mackie and Dockrell (2004) , Fey et al. (2004) showed significant improvement due to intervention where as the studies like Difficulty in contextual convention writing by Ferouhi (2007) and Kiran (2005) reported that there is still significant difficulty after intervention. Picture story language test by Mackie and Dockrell (2004) Mackie and Dockrell (2004), Fey et al. (2004), Singaravelu (2001) proved useful.

## **2.14 Studies Related to Instructional Strategies to Tackle Dysgraphia**

Graham and Harris (1989a) in a study, students were taught a question asking strategy to improve their narrative writing. Awareness of narrative text conventions was a prominent feature of all stages of the intervention. Initially, students were taught to identify story grammar elements in the stories they read. A mnemonic for seven story grammar questions was used during this phase. Once students could recite the mnemonic and discuss its meaning, they moved to the next phase, which involved generating story grammar elements while looking at a picture. A five-step learning strategy was used to help students write stories using the picture prompt. In modeling the strategy using think-aloud techniques, teachers were careful to stay close to

the story grammar framework. Students then practiced the five-step learning strategy as they wrote their own stories. In the feedback dimension, the stories were read by the teacher and students as a group. If any of the story elements were missing, the group discussed how and where it could be added. Stories were returned to the students for revision based on teacher and student.

Englert et al. (1991) tested an approach to the writing process called cognitive strategy instruction in writing where the study was conducted simultaneously in both general and special education settings and included students both with and without LD. Students in the cognitive strategy instruction condition received 5 months of instruction that consisted of four phases: studying writing samples, following a given text structure, such as compare & contrast. Teachers led discussions of the features and quality of the writing sample using text structures as a framework. The objective was to simultaneously provide students with an impression of what quality final written products were to resemble and to provide them with a language for expressing their perceptions.

Graham & Harris (1997), showed that by targeting explicit instruction in transcription skills-that is, spelling and handwriting-and by teaching sophisticated writing strategies, the student's overall writing ability will improve by a greater degree than it would if the instruction were to focus only on improving content quality or only on the mechanical aspect.

Graham & Harris, 1997, observed that the A central problem in the writing of students with LD is their failure to plan and organize their writing (Hillocks, (1984). This shortcoming was described by Graham and Harris (1997), who noted that when students with LD approach writing tasks & attention is directed to the needs of the audience, the organization of text, the development of rhetorical goals, or the constraints imposed by the topic.

Sivakami (2000) investigated on the effectiveness of certain instructional strategies to overcome learning disabilities in English at primary stage. The major focus was on the remedial instructional strategies to be adopted for the children with reading, writing and spelling difficulties. The posttest achievement scores were higher than the pre-test achievement

scores. This throws light on the effectiveness of the remedial instructional strategies used to overcome learning disabilities in English.

Elbaum & Vaughn (2001) reported that the intervention programmes with average duration of 10 weeks resulted in a great improvement in the reading of students with reading difficulties.

Reepa Sanghavi (2001) compared the performance of normal and learning disabled children (LD) on Beery and Buktenica's Developmental Test of Visual-Motor Integration (DVMII). Experimental group and control group, each consisting of 16 LD children were assessed individually. Experimental group was given occupational therapy intervention in the department and supplementary therapy by parents, guided by therapist, regularly for 12 weeks. OT intervention included ergonomic factors, gross and fine motor activities. It was found that improvement in experimental group was more as compare to control group ( $P < 0.001$ ).

Gersten et al., 2001, in their study observed that planning sheets and cognitive strategies can help stimulate students' thinking, organize writing ideas, and guide the actual task of putting pen to paper.

Russell Gersten and Scott Baker, (2001), presented the results of a meta-analysis on writing interventions for students with learning disabilities and draw implications for practice. 13 studies designed to teach students with learning disabilities to write better expository or narrative text were analyzed. Results indicated that the interventions used in the research studies consistently produced strong effects on the quality of students' writing as well as students' sense of efficacy and understanding of the writing process. Findings suggested that 3 components should be part of any comprehensive instructional program. Explicit teaching of (a) the steps of the writing process and (b) the critical dimensions of different writing genres should be provided, as well as (c) structures for giving extensive feedback to students on the quality of their writing from either teachers or peers.

Rose & Mayer (2002) reported optimistic findings about instructional technology applied to students with Specific Learning Disabilities with an advantage in versatility, flexibility and sharing ability, digital media and

software were improved educational opportunities for students with Learning Disabilities.

Srikanth and Karanth (2003) developed a remedial programme based on the Aston Teaching Programme focusing on auditory visual channel deficits, specific spelling rules and cues training in comprehension skills, oral expression, written expression and visuo-motor perceptual skills. The remedial programme included both reading and spoken language proficiency.

Bowers et al. (2003) tested the global theory relating writing to intact cerebral integrity by attempting to predict writing scores of individuals with academic difficulties and the result indicated the importance to assess the cognitive contributions of writing difficulties to guide remediation.

Chen (2005) conducted a study on Taiwanese ESL (English as second language) students to examine the effects of co-operative learning instructional approach on two aspects of Taiwanese ESL students. The first was their motivation towards learning English. The second was their proficiency in listening, reading, and speaking skills. This research effort was a quasi-experimental design. There were hundred participants. The results did not show any significant differences in comprehensive language skills of the two groups.

Marshal (2005) reported a novel form of writing deficits that is writing without vowels among the two Italians who had damage to left hemisphere, and revealed that disorders of writing and spelling (Dysgraphia) are a frequent consequence of damage to the left hemisphere.

Santhanam (2005) studied the remedial programmes for children with learning difficulties. Major findings: i) The intellectual capacity of the children with learning ability is significantly higher than those with learning disability. ii) Children with learning disability show better academic performance after remedial programme. Strategies based on findings: i) Orientation programmes regarding learning disability may be arranged in collaboration with NGOs for the teachers. ii) Awareness and remedial programme about learning disability to be conducted through print and electronic media. iii) Periodically

counselling programmes to be arranged for teachers and parents in this regard.

Viswaprasad (2005) found that the performance of both boys and girls were almost same in all writing skills, but there was a significant difference in writing spelling among them.

Krishnakumar et.al (2006) studied on effectiveness of individualized education program for slow learners to evaluate the effectiveness of an individualized education program for children with scholastic backwardness.

The result showed that the children had significant improvement in their academic functioning and self esteem after the training.

Wanzek, Vaughn, Waxler, Smanson, Edmonds and Kin (2006) conducted a study of spelling and reading intervention and their effects on the spelling outcomes of students with learning disability. Spelling outcomes consistently improved following intervention that included explicit instruction with multiple practice opportunities and immediate corrective feedback. Spelling intervention that employed assistive technology aimed at spelling in written composition indicated positive effect on spelling outcomes. The attained level of reading words and reading text was found to be stable over a four year follow up period. Spelling showed a slight decline one year after the treatment, but remained stable thereafter.

Kartikeswar Behera and Niladirpradhan (2007) conducted an experimental study on "Exploring the creative potentialities of children with learning disabilities". They concluded that learning disabled children performed better than normal children in the posttest stage in the creative activity conducted for both groups in almost all the activities.

Pagedar and Sarnath (2008) developed the PASS Reading Enhancement Programme (PREP), a theory driven remediation program for primary reading comprehension. This programme aims at improving information processing strategies and avoids direct teaching of word skills like phoneme segmentation/ blending.

Padhy, Meera and Padmaja, (2008) investigated the effect of an intervention Programme on certain cognitive skill of disadvantaged children age 5 to 10 years. Sixty Children were randomly assigned to experimental and control groups. Results showed that (1) the performance of experimental group showed significant improvement as a result of intervention (2) the performance of experimental group of children showed improvement and better integration over the testing sessions during intervention (3) the effects of training intervention were found to persist up to six months after the training.

Graham and Hebert (2010) conducted a meta-analysis of studies that investigated whether students' writing activities had any effect on their reading abilities. As one might expect, they found a strong reciprocal relationship between reading and writing. Having students write about what they have read helps improve their reading abilities.

Vander Hart et al., (2010). An in-depth analysis of handwriting curriculum and instruction in four North American kindergarten classrooms was carried out using both quantitative and qualitative methods and the effectiveness of remediation is established through effective classroom practices like 1. Frequent/daily lessons 2. Direct and Explicit Instruction 3. Modeling 4. Guided Practice 5. Use of Feedback 6. Independent Practice 7. Integrated Lessons 8. Writing Materials. It proved effective.

Chirandon, Laohawiryanon, and Rakthong (2010) investigated the effects of teaching English through games to Thai students who study in grade six at Tessaban four Banlamsai School. Thirty students were selected by purposive sampling as an experimental group.. The findings revealed that students had significantly improved in vocabulary knowledge and ability to communicate. Moreover, they tended to have more positive attitudes towards learning English through games. Regarding these results, it can be recommended that using games in teaching English is beneficial to beginners.

Rijumol, Thangarajathi & Anantharayanam (2011) attempts to explore the underlying construct of cognitive processing and self perception of learning disabilities in elementary inclusive school children and the study

revealed that the multimedia approach to the concept of cognitive processing enabled to bring out the underlying construct of cognitive processing.

Shankar & Kumar (2011) found that the Programme Instruction method and Computer Assisted Instruction (CAI) method of teaching were found to be significantly effective in remediation of arithmetical learning disability among lower primary level students with learning disability and both these methods of instruction were equally effective for both boys and girls.

Anila Kumari (2012) studied on developing a multimedia remedial tracking package for dysgraphia among primary school students with specific learning disabilities. The study was to identify and assess Dysgraphia among Primary School Students (PSS) with Specific Learning Disabilities (SLD) and to prepare Multimedia Remedial Tracking Package (MRTP) which is a flash software based on visual, auditory and kinaesthetic learning styles for minimizing Dysgraphia as well as LD, as an intervention techniques and remediation for tracking/channelling the PSS with SLD in the common class room with a sample of 39 students with dysgraphia. The findings of the study showed that MRTP is effective in minimizing / remedying and tracking the students with Specific Learning Disabilities. This finding has much importance in the individual learning of students with Special Educational Needs, and it will help to reduce the number of under achievers.

Morris, et al. (2012) evaluated the remedial reading interventions i.e., the effectiveness of two multiple component intervention programmes for children with reading disabilities against alternate and phonological control programmes in which the intervention given daily but at three different stages, and the multiple component programmes showed significant improvement relative to control programmes on all reading skills with one year follow-up.

Hock (2012) observed adults with SLD had minimum reading score at the third grade level in the Adult Basic Education programme and found that explicit instruction, instructional technology; intensive tutoring in skills and strategies embedded in authentic contexts affected literacy outcomes of adults with SLD.

Lenka Mynařiková, (2012) conducted a study on 'Art-Based Program for Social and Emotional Development of Children', Grade 5 of primary school for children aged 11-12 for once a week for 45 minutes and worked with 25 children on improving their skills in communication, cooperation, manifestation, and recognition of emotions and identity enforcement. Each skill was covered by two lessons, with the first and last lessons including a class climate evaluation using the CES (classroom environment scale) (Moos & Trickett, 1987) and B-3 (Braun, 2006) methods. The final evaluation revealed that after the whole program, children were more confident in expressing their identity, more content with the class climate and they thought of their class as more safe, intimate, and cooperative environment.

Torreno (2012) gave suggestions on assignments modifications without changing the academic task as follows: Reduce copying of assignments and tests. Choose the questions that the students should answer in complete sentences and then allow the others to be answered in phrases or words. When students share copying definitions, let the students shorten them or give them the definitions and have them highlight or underline important words or phrases. Give shorter written assignments. Grade assignments on individual elements of the writing process. On one assignment, make spelling count, then make grammar count on the next. On long-term assignments, help the students plan by providing due dates and working with them as a deadline approaches. Give the students an alternative to a written assignment. Assign an oral report or visual project and specify what the students should include. Strategies for dealing with dysgraphia, such as these modifications and accommodations, help facilitate learning and ease difficulties inside and outside the classrooms.

Zahra Nikmanesh et, al, (2012) conducted a study on the 'The effects of purposive drawing on dysgraphic disorder' in Iran on a sample comprised of 40 subjects that were randomly assigned into two experimental and control groups, 20 subjects in each one. Results of t-test and Analysis of Covariance showed that change in the dysgraphic disorder for the experimental group is significantly more than the control group and the PDP reduced disorders of writing and spell Deficits. Thus, the PDP is effective in dysgraphia disorder treatment.

Bhawana Singh and Anshu (2013), studied the Impact of intervention on children with learning disabilities in a total of thirty seven children already identified with learning disabilities from the pre-primary schools of Rudrapur. Planned intervention strategies were implemented on weekly basis on each subject for three months regularly, after that post testing was conducted with the help of Behavioural checklist to evaluate the impact of intervention. Teachers and parents of these children were also interviewed periodically to assess the changes after intervention in children. It is concluded that learning disabilities can be improved significantly with intensive early intervention.

McEachern, Tamara, 2013, Conducted a study to determine if a handwriting intervention would increase abilities in reading and writing skills, in graphomotor and visual-motor integration skills, and improve the participants' self-perceptions and self-descriptions pertaining to handwriting enjoyment, competence, and effort. A single-subject research design was implemented with four struggling high school students who each received 10.5 to 15.5 hours of cursive handwriting intervention using the write program. In summary, the findings indicated that the students showed significant improvements in aspects of reading and writing; that they improved significantly in their cursive writing abilities; and that their self-perceptions concerning their handwriting experience and competence improved.

Rose et al. (2013) employed a cueing hierarchy on 11 participants with aphasia, in which they were asked to gesture, draw, copy and repeat the target words of verbs and nouns. Two types treatment M-MAT (multi modal) employed as a cueing hierarchy, in which participants were asked to gesture, draw, copy and repeat the target words. CIAT plus (constraint induced) consisted of a cueing hierarchy of phonemic and written cues, with participants only being asked to name the item. It was found that both treatment approaches were equally efficacious.

Susheela Narang Raj K. Gupta (2014) studied The Effect of Multimodal Remedial Techniques on the spelling ability of learning disabled children to examine the effectiveness of three remedial techniques to improve the spelling ability of students with learning disability. The three techniques, namely, TAK/v, visual orthographic method and listen, speak, read and write

(LSRW) method were administered to three experimental groups, each having 13 students with learning disability. The students in the sample had at least average intelligence, manifested specified traits of learning disability, had significant deficits in spelling skills and had no sensorial problems. The results indicated that all the three remedial techniques were significantly effective in ameliorating spelling deficits among students.

Studies with effective remedial techniques and different strategies are (Susheela Narang Raj K. Gupta, 2014, Bhawana Singh, and Anshu (2013), McEachern, Tamara, 2013, Rose et al. (2013), Anila Kumari (2012), Morris, et al. (2012), Hock (2012), Lovett et al. (2012), Torreno (2012), Lenka Mynařiková, (2012), Zahra Nikmanesh et, all., (2012), Khushvinder & Rekha (2011), Rijumol, Thangarajathi, & Anantharayanam (2011), Shankar & Kumar (2011), Vander Hart et al., (2010), Chirandon, Laohawiriyanon, and Rakthong (2010), Pagedar and Sarnath (2008), Padhy, Meera and G Padmaja, (2008), Kartikeswar Beheraand Niladirpradhan(2007), Krishnakumar et.al. (2006), Wanzek, Vaughn, Waxler, Smanson, Edmonds and Kin (2006), Chen (2005), Marshal (2005), Santhanam (2005), Viswaprasad (2005),Lembke, Deno, and Viswaprasad (2005),Hall (2003), Bowers et al. (2003), Srikanth and Karanth (2003), Rose & Mayer (2002), Elbaum & Vaughn (2001), Sivakami (2000).

All the Studies of handwriting remediation suggest that intervention is effective. There is evidence to indicate that handwriting difficulties do not resolve without intervention and affect between 10 and 30% of school-aged children. Despite the widespread use of computers, legible handwriting remains an important life skill that deserves greater attention from educators and policy makers.

The current review of literature was not intended to be an exhaustive examination of all learning disabilities research for effectively improving writing for children with dysgraphia. The review of related literature empowered the Researcher to have extensive information on the Learning Disabilities and Specific Learning Disabilities, Dysgraphia and Instructional Strategies.

Most of the studies concentrated on educational provisions, identification, assessment, teacher awareness, parental attitudes, evaluation

and effectiveness of certain remedial and instructional strategies in reading, Dyslexia. A few studies concentrated on fine motor, writing, spellings, audio visual media, technology and devices, arithmetic difficulties and behavioural problems in children with learning difficulties.

Decades of research suggest that intervention & remediation are an essential part of the education of children with Learning Disabilities at school and home. This encourages the Researcher to attempt to develop instructional strategies for 4<sup>th</sup> and 5<sup>th</sup> class children with dysgraphia so they may be greatly benefited in acquiring grade level competency in writing skills.