

Clinical Practice Guidelines for the Specific Learning Disorders (Lead Paper)

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SECTION-1 REVIEW OF LITERATURE

A) INTERNATIONAL STUDIES

An epidemiological study in British school children in the age range of 8-10 year found the prevalence of 'specific reading difficulties', specific arithmetic difficulties and combined 'specific arithmetic-and-reading difficulties' to be 3.9%, 1.3% and 2.3% respectively. Thus, the overall prevalence of SpLD may be around 7.5% (1). In the similar manner, in another epidemiologic study which estimated the prevalence of specific language impairment (SLI) in monolingual English-speaking kindergarten children, an estimated overall prevalence rate was found to be 7.4%. The estimated prevalence for boys was 8% and for girls 6% (2). The prevalence of developmental dyscalculia has been reported to be around 3 to 6% in the school-aged population and is as common in girls as in boys. It is reported that dyscalculia can occur as a consequence of premature birth and low birth weight and is frequently associated with a variety of disorders, such as attention-deficit hyperactivity disorder (ADHD), developmental language disorder, epilepsy, and fragile X syndrome (3, 4). According to one Asian study the prevalence of dyslexia and probable dyslexia were found to be 6.3% and 12.6% respectively. The male to female ratio of dyslexia was 3.4:1 (5). One of the best clinical description and practical management strategies of this disorder can be found in a book 'No easy answers, by Sally Smith (6). For the professionals, who wish to help these children one of the best treatment modalities is remedial education. A detailed description of remedial education in 53 different areas can be found in a handbook by Robert Valett (7). A book by Jeffree and Skeffington, 'Let me read' describes many useful teaching methods for children with severe learning disabilities (8).

B) INDIAN STUDIES

There are a few Indian studies on specific learning disorders. Agrawal et al used Bender Gestalt test, Piaget's test and Indian modification of WISC for the detection of SpLD in rural primary school children. A relatively high prevalence rate of almost 13% was observed in their study (9). As opposed to this, in a community based epidemiological study conducted at Bangalore, the most common SpLD was found to be 'disorder of written expression' in 1.8% of the children and adolescents in urban and rural areas (10).

Shah and Bajaj have conducted a study to detect children having uneven performance in different subjects in school using a statistical method. Out of 186 students of an English medium school, it was found that 34% of the students had significantly poor performance at least in one subject as compared to their performance in other subjects. The poor performance was mainly either in languages (Marathi, Hindi) (43/186) or arithmetic (14/186). It is suggested that this statistical method may be used as a screening tool to detect children who may be having SpLD(11). Shah et al in their review article on specific learning disorders have described the prevalence of SpLD to be in the range of 2-10% and 2-4 times more frequent in boys. They have also described detailed clinical features of these disorders with lots of examples (12). One of the most common co-morbid condition with SpLD is Attention Deficit Hyperactivity Disorder (ADHD). A detailed description and suggested line of management has been described in a review article by Shah (13).

Section-2 Recommendations & practice guidelines

I. INTRODUCTION

Learning is acquisition of new knowledge, skills or attitude. Children during their early years of development learn to understand the spoken language first and then learn to speak. Subsequently during their school years learn to read, write and do arithmetic according to their age and intellectual capacity. But some children may not be able to learn one or more of these skills as per their age and intellectual capacity. For example, a 9 year old child, studying in 4th standard having an intellectual capacity in the normal range may be reading and writing like a child in the 2nd standard or a student in 7th class may not be able to do the arithmetic sums like his classmates in spite of having above average intellectual capacity. Thus, it seems that there are some children, who, in spite of having normal intellectual capacity and unimpaired visual, hearing or physical abilities are unable to acquire one or more age appropriate language and/or arithmetic skills, even when adequate opportunities for learning are provided. These children have specific learning disorder (SpLD).

Interestingly, inability to learn certain skills is not restricted to only reading, writing and arithmetic. Children may have difficulty in understanding and expressing age appropriate communication due to which they may not be able to understand jokes or the abstract meanings of phrases or tell a story in an organized manner. Similarly, some children may not develop age appropriate motor coordination as a result of which they may not be able to learn certain skills like skating or dancing requiring high level of coordination.

Broadening this concept, delinquent children may be viewed as those who are unable to learn to respect the moral, ethical and social norms. They are unable to acquire the right attitude towards these norms and so indulge in antisocial activities! But so far children having conduct disorder are not included under the heading of specific learning disability.

II. TERMINOLOGIES IN COMMON USE & RECOMMENDED TERMINOLOGIES.

Unfortunately, to describe this very same disorder, different terminologies have been used in the literature, standard textbooks and classification systems.

A) LEARNING DISABILITY/ LEARNING DISORDERS/ LEARNING DIFFICULTY

Learning disability is one of the most widely used terms. This term tries to emphasize the more or less permanent and irreversible nature of this disorder. It equates it with the other types of disabilities like some of the physical disabilities. It also tries to justify the case for provision of concessions to these children the way it is stipulated for other physically disabled or visually/hearing impaired individuals.

DSM-IV-TR prefers the term 'Learning disorders' as it prefers the expression 'disorder' for almost all the diagnostic categories like 'Attention-deficit and disruptive behavior disorder', 'Pervasive developmental disorders' and 'Elimination disorders'. Under the heading of learning disorder DSM-IV-TR includes reading disorder, mathematics disorder and disorder of written expression. The term 'disorder of written expression' may not be a very appropriate term. Children having difficulty in writing do not have problems in only expressing their ideas in writing as the term suggests. They may have difficulty in holding pen, they may be very slow in writing, writing tires them, they may make lots of spelling mistakes etc. So, more appropriate term may be 'writing disorder' in stead of 'disorder of written expression'.

Some clinicians also use the term 'Learning difficulty' for the children who have very mild problem in reading and writing which by and large does not interfere much with their studies and who do not fulfill DSM-IV-TR criteria (of discrepancy of more than 2 standard deviations between achievement and IQ) for the diagnosis of learning disorder.

B) DYSLEXIA/DYSGRAPHIA/DYSCALCULIA/DYSPREXIA/MBD

More fancy terms used for these disorders are dyslexia (Specific reading disorder), dysgraphia (Specific writing disorder), dyscalculia (Specific arithmetic disorder) and a broad term Dysprexia (Aprexia for reading, writing and mathematical abilities).

Earlier these disorders along with behavioral symptoms like hyperactivity were considered due to damage or dysfunction of certain areas of brain and so the term 'Minimal Brain Dysfunction' (MBD syndrome). This term is not very popular and not widely used nowadays.

C) COMMUNICATION DISORDERS (EXPRESSIVE LANGUAGE DISORDER, MIXED RECEPTIVE-EXPRESSIVE LANGUAGE DISORDER, PHONOLOGICAL DISORDER, STUTTERING)

DSM-IV-TR classifies 'expressive language disorder', 'mixed receptive-expressive language disorder', 'phonological disorder' and stuttering under the heading of communication disorders and not under learning disorders. Language does not include only reading and writing. It also includes understanding the spoken language and ability to express ones ideas by speaking. So inability to do so as per the age and intellectual capacity is also a part of specific learning disorder. On the other hand reading and writing are also part of communication. So it may be more appropriate to put all these disorders under a broad heading of specific learning disorders. It is debatable whether 'stuttering' should be considered as a type of learning disorder or not. Arguably, it is not a problem of learning. Children having stuttering may be able to speak normally (without stuttering) in some situations while they may have severe difficulty in pronouncing even few words in unfamiliar situations or on stage. So it should not be considered as learning disorder and should be classified separately.

D) MOTOR SKILLS DISORDER (DEVELOPMENTAL COORDINATION DISORDER)

As mentioned in introduction, the way one may have problems in learning to read and write, one may have problems in learning activities which require high level of coordination such as dancing, skating cycling etc. So, 'motor skill disorder' or 'coordination disorder' should also be classified under the broad heading of specific learning disorders and not separately as in DSM-IV-TR and ICD-10.

E) Specific developmental disorders of scholastic skills / Specific developmental disorders of speech and language / Specific developmental disorders of motor function.

To make things more inconsistent and complicated, ICD-10 classifies these disorders under the heading of 'Specific developmental disorders of scholastic skills' 'Specific developmental disorders of speech and language' and 'Specific developmental disorders of motor function'.

It is arbitrary to say that reading, writing and mathematical skills are scholastic skills and understanding and expressing language are not. On the contrary understanding the spoken language (as carrying out given instructions) and expressing ones idea (as in story telling and elocution) comes much before reading and writing in nurseries and kindergartens. The adjective 'developmental' (in ICD-10) is unwarranted as the diagnosis is based on the clinical features and not on the presumed contributory etiological factors.

F) Specific learning disorders (SpLD)

As an alternative to above mentioned terms, 'Specific learning disorders (SpLD)' seems to be more appropriate term for various reasons.

- 1) The term - 'Learning disability' is used in some countries like UK for mentally retarded individuals. Though, in some children the problem in reading and writing may be very severe almost like a disability, in most of the children it may not be very severe and disabling. So in stead of 'disability' it is better to use 'disorder'.
- 2) Frequently, the disability in learning, in these children, may not be generalized and may be explicit, restricted to only one area. For example, the child may have difficulty only in arithmetic and not in reading or writing. So it is more appropriate to have a prefix 'specific' as in 'specific learning disorder'.
- 3) The term used in ICD-10 'Specific developmental disorders of scholastic skills' does not clearly bring out the issue of difficulty in learning these skills which the children having this disorder have.
- 4) Reading, writing and arithmetic are the language skills and not necessarily only 'scholastic skills'. The adjective 'developmental' is unwarranted as the diagnosis is based on the clinical features and not on the presumed contributory etiological factors.

Table-1 DSM-IV-TR, ICD-10 and recommended terminologies.

DSM-IV-TR	ICD-10	Recommended
Learning Disorders	Specific Developmental Disorders of Scholastic Skills	Specific Learning Disorders
- Reading Disorder	- Specific Reading Disorder	- Reading Disorder
- Mathematics Disorder	- Specific Disorder of Arithmetical Skills	- Mathematics Disorder
- Disorder of Written Expression	- Specific Spelling Disorder	- Writing Disorder
	- Mixed Disorder of Scholastic Skills	
Communication Disorders	Specific Developmental Disorders of Speech and Language	
- Expressive Language Disorder	- Expressive Language Disorder	- Expressive Language Disorder
- Mixed Receptive-Expressive Language Disorder	- Receptive Language Disorder	- Receptive Language Disorder
- Phonological Disorder	- Specific Speech Articulation Disorder	- Articulation Disorder
- Stuttering		
	- Acquired Aphasia with Epilepsy	
Motor Skills Disorders	Specific Developmental Disorder of Motor Function	- Coordination Disorder
- Developmental Coordination Disorder		

III. HOW MANY CHILDREN IN EACH CLASS ARE LIKELY TO HAVE THIS PROBLEM?

A. PREVALENCE:

In each class of about 40 to 50 students, right from nursery & kindergarten to 10th standard, it seems that on an average 2 students have learning disorder. This clinical observation matches with the reported prevalence of about 5% for learning disorders in the literature. It means that in our country, India, where we have about 250 million school-going children, we have about 12.5 million (1.25 crore) children suffering from learning disorder. It is important to note that most of the time children are evaluated for reading, writing and arithmetic disorders only. Very rarely they are systematically evaluated for receptive or expressive language disorders or coordination disorder, the prevalence rates for which are assumed to be similar. These disorders go hand-in-hand except in few cases where some children may have only reading and writing disorder but they may be good at arithmetic and vice-a-versa.

B. GENDER DIFFERENCES

Barring arithmetic disorder which may be more common in girls, all other learning disorders seem to be 3 to 4 times more common in boys.

C. MOTHER-TONGUE AND MEDIUM OF INSTRUCTION

This disorder is seen world-wide and occurs in students irrespective of their mother-tongue and medium of instruction in the school which may be English or any other vernacular language such as Hindi, Gujarati, Urdu, Tamil, Telugu, Bengali, etc. The difficulty faced by these children may be more obvious in non-phonetic languages like English than in phonetic vernacular languages. But changing medium of instruction does not help. Children who learn in Chinese or Japanese language in which are only symbols may also have learning disorder.

D. VISUALLY HANDICAPPED AND DEAF AND MUTE CHILDREN

It is interesting to note that this disorder may be detected even in students who are blind or deaf; they may fail to learn 'brail language' or 'sign language' respectively, as per their age, in spite of having good intellectual capacity and adequate opportunities to learn these languages.

IV HOW TO IDENTIFY THESE CHILDREN?

A. PRIMARY PROBLEM

One of the best descriptions of clinical features of the children having specific learning disorder is given by Ms. Sally Smith in her book 'No Easy Answers'.

Have you seen this child?

He reads "saw" for "was".

He says a 'b' is a 'd' and a 'd' is 'p'.

He skips, omits or adds words when he reads aloud.

He doesn't see the difference between 'pin', 'pan' and 'pun'.

She can hardly spell a word.

She writes '41' for '14'.

He can talk about life on Mars and an expert strategist in checkers but confuses between 'yesterday' and 'tomorrow'.

She asks endless questions but doesn't seem interested in answers.

He has an adult vocabulary but avoids using past tense.

He doesn't pay attention.

She is distracted by the least little thing.

He acts like an absent minded professor and has untied shoe laces as well. He loses his homework, misplaces his book, and forgets where he has to be. He doesn't look where he is going, bumps into the door, trips on his own feet.

It is evident from above description that a child with a specific learning disorder is one who has an average or above average intellectual capacity and in spite of adequate opportunity for learning, has significant difficulty in specific areas like reading, writing and arithmetic. These difficulties are neither due to sensory or motor deficit nor to any other psychiatric disorder like pervasive developmental disorder.

Clinically the most common complaints by the parents or teacher are

- a. Writes very slowly

- b. Can't complete his books in the class
- c. Has to borrow notebooks from friends to complete the class-work at home
- d. Avoid writing
- e. Writing tires him a lot
- f. Very poor handwriting
- g. Lots of spelling mistakes
- h. Can't complete his exam papers
- i. Doesn't write full sentences, answers in one or two words in exam
- j. Manages to do only objective questions
- k. Does not remember and attempt long answers
- l. Good at oral work

1. READING DISORDER

Reading disorder is usually apparent by the age of 5 to 7 years. Difficulty in reading leads to concurrent difficulty in writing as well.

The commonly observed difficulties are:

Reads very slowly, hesitantly and reading tires him greatly.

Reads word by word, struggling with almost each and every word.

Loses place in the text.

Reads without punctuation.

Reads a 'b' for a 'd' reads 'bog' for 'dog' Mirror reading – reads 'saw'.

Doesn't look carefully at the details and reads by guessing, thus reads "farm" for "front."

Omits, substitutes, adds words to a sentence. Given stress on the wrong syllable.

2. WRITING DISORDER

Writing disorder is usually apparent in the 1st or 2nd standard, when children are required to write.

The commonly observed difficulties are

Avoids writing whenever possible.

Writes incredibly slow.

Holds pencil awkwardly.

Poor handwritings, poor spellings.

Leaves no space between words, no punctuation. Writes letters backwards or upside down, 'n' for 'u'. Writes a 'b' for a 'd' and vice versa.

Mixes lower case letters with capitals.

No size consistency.

Transposes the order of letter, writes 'the' as 'teh', 'left' as 'felt'.

Mirror writing 'saw' for 'was'.

Omits prefixes and suffices.

Adds letters, writes 'went' as 'whent'.

Writes isolated parts of words, 'amil' for 'animal' and 'hrd' for 'hand', 'rember' for 'remember'.

Spells words phonetically 'sez' for 'says', 'gowing', for 'going'.

Disguises poor spellings with messy handwritings.

3. Arithmetic disorder

Arithmetic difficulty may not be evident in early years but by the 3rd or 4th standard the difficulty becomes obvious and pronounced.

The commonly observed difficulties are:

He takes longer than the normal time to solve a particular set of problems.

Makes mistakes when the arithmetic problems involve adding, subtracting or multiplication by 0 or 1 E.G. $1+1=1$, $3-0=0$, $5 \times 0=5$, $17-15=12$

Makes mistakes when the problem involves the same numbers or sequential numbers. E.G. $3-3=3$, $5+4=8$, $8-9=16$

Difficulty in keeping unit, tens and hundredth places

E.g.

$$\begin{array}{r} 206 \\ x 50 \\ \hline 000 \\ 1030 \\ \hline 1030 \end{array} \qquad \begin{array}{r} 607 \\ x 60 \\ \hline \\ 3642 \\ \hline 3642 \end{array}$$

Difficulty in carrying over and borrowing

E.g.

$$\begin{array}{r} 71 \\ + 9 \\ \hline 710 \end{array} \qquad \begin{array}{r} 46 \\ - 7 \\ \hline 33 \end{array}$$

Original method of solving multiplication and division problems.

E.g.

$$\begin{array}{r}
 11 \quad 33 \quad 87 \\
 \hline
 4 \mid 44 \quad \quad \quad 5 \mid 1515 \quad \quad \quad \times 4 \\
 \quad \quad 4 \quad 1515 \quad \quad \quad \quad \quad 228 \\
 \hline
 \quad \quad 40 \quad \quad \quad \quad \quad \quad 0000 \\
 \quad \quad \quad 4 \\
 \hline
 \quad \quad \quad 0
 \end{array}$$

Solves problems of mental arithmetic without understanding the concept.

E.g. I have 24 apples to divide equally among 4 boys. How many should each get?

Ans: 20

Difficulties with arithmetic do not have the social stigma associated with reading and writing difficulties. In fact, many people who would take great pains to hide their reading and writing difficulties will readily admit or even brag about their difficulty in arithmetic.

4. EXPRESSIVE LANGUAGE DISORDER

There is a marked impairment in the development of age appropriate expressive language which results in the use of verbal or sign language that is markedly below the expected level, considering the child's non-verbal intellectual capacity. The child's language receptive skill remains relatively intact.

The disorder may be evident by the age of 18 months, when the child fails to speak spontaneously or echo words and sounds. Even utterance of simple words like 'mama', 'dada' may be absent. When the child grows older his vocabulary may be limited to only a few words. The child otherwise does try to communicate by gestures and relates to his parents and other people unlike an autistic child.

The commonly & observed difficulties are:

Can't say something in an organized manner.

Can't tell a story.

Has immature word use and ungrammatical phrasing, e.g. "he got dead" for "he was killed", "I bought it" for "I bought it", "My notebook is gooder than his" for "my notebook is better than his notebook".

Uses wrong words, makes wrong punctuation and reverses the order, e.g. "dog ate god food" for "dog ate good food", "sneaked over to read boy play" for "sneaked over to read Playboy", "moccunication" for "communication", "stelescope" for "telescope".

5. RECEPTIVE LANGUAGE DISORDER

It is also called mixed receptive –expressive language disorder, since usually significant receptive language disorder leads to poor acquisition of expressive language skills. This disorder usually becomes apparent between 4 to 7 years of age.

The commonly observed difficulties are:

Trouble following directions and instructions.

Appears to be deaf, but responds well to non-language sound from the environment.

Learns from watching, not by listening.

Very literal, doesn't understand jokes.

Can't deal with multiple meanings of words.

6. ARTICULATION DISORDER

The essential feature of articulation disorder or 'phonological disorder' is difficulty in making correct pronunciations. It is evident by the age of 3 years to 6 years, when a child is expected to have clear pronunciations and not 'baby talk'. Many children overcome this difficulty spontaneously by the 3rd standard.

The commonly observed difficulties are:

Not able to articulate certain phonemes correctly. Distorts, omits, adds or substitutes certain phonemes. E.g. speaks "bu" for "blue", "ca" for "car", "wabbit" for "rabbit", "fum" for "thumb", "whath dat" for "what's that", "puhretty" for "pretty".

7. MOTOR CO-ORDINATION DISORDER

This disorder is characterized by poor performance in age-appropriate activities which require motor co-ordination. It may be evident in the very first year of life. The child may have difficulty in motor activities like training to one side, sitting, standing, etc. Later, the child may show clumsiness in gross and fine motor activities.

The commonly observed difficulties are:

Not able to hold the objects properly, drops them easily.

Unsteady gait, may trip over his feet, bumps into other children or obstacles while attempting to go around them.

Not able to play games, sports which require good co-ordination.

The child presenting with difficulty in a particular area should also be assessed for his performance in other areas. In general each child should be evaluated for his reading, writing, spelling, arithmetic, expressive and receptive language, and motor co-ordination skills. It is not unusual to find a child having difficulties in more than one area.

Along with these symptoms of specific learning disorder, many have associated emotional and behavioral problems. They may avoid reading, writing and going to school or may develop severe anxiety when they have to do so. They may feel ashamed and isolate themselves. They may develop poor self esteem and sense of inferiority and inadequacy. They feel angry and frustrated due to repeated failures in academic and non-academic activities.

Almost a third to these children may have other associated psychiatric disorders like attention deficit hyperactivity disorder, conduct disorder, enuresis, etc.

B. SECONDARY PROBLEMS

1. Low self-esteem: As result of persistent inability to read and write up to the expected level and constant criticism, comparison and sometimes punishment from the parents and teachers some of these children may develop very low self-esteem and lack confidence which may further aggravate their scholastic difficulties.

2. Lying: To avoid scolding, humiliation and punishment from parents some of these children may not show their result to their parents; may lie about the marks they have scored in a particular exam or may change the marks by themselves and deceive their parents.

3. Temper-tantrums: Children in primary school may turn stubborn, obstinate, and irritable; frequently throw temper-tantrum, lose their temper, and may become abusive and violent after repeated failures and frustration.

4. Rebelliousness: Children in secondary school may turn rebellious, defy the parents and may outright refuse to do home work or sometimes even refuse to attend school.

C) DIAGNOSIS

The diagnosis of specific learning disorder should be considered and ruled out in all the children who have either scholastic backwardness or difficulty in communication. In history, specific attention should be paid to the type of difficulty faced by the child. His performance in oral test and written test, as well as his performance in different subjects should be compared for any discrepancy. His reading, writing, arithmetic abilities and communication skills should be clinically evaluated. Neurological examination specifically for soft neurological signs may be useful. Investigations like EEG or CT scan may be required in a few cases.

For the objective diagnosis of any of the specific learning disorders, it should be clearly demonstrated that the achievement in a particular area as measured by individually administered standardized tests is substantially below the expected achievement. The expected achievement is judge by considering the chronological age of the child, his intellectual capacity and the availability of appropriate educational opportunities to him.

Inadequate schooling, unfamiliarity with the language, environmental deprivation, neurological deficits, hearing and visual impairment etc. should be ruled out before making the diagnosis of specific learning disorder.

Clinically, along with the type of learning problem, it is important to judge the severity of impairment as important to judge the severity of impairment as well. Based on the severity of impairment, one may like to differentiate between 'difficulty', 'disorder' and 'disability'.

The child may have only mild difficulty in a particular areas like reading or writing, which is observed by his parents or his teachers but on standardized tests, his achievement may not be substantially below expected levels. Such a child may be recognized as having a 'Specific learning difficulty'.

The child may have substantial difficulty in a particular area which is evident on standardized tests of achievement and the difficulty can be overcome to a significant extent by remedial education. Such a child should be recognized as having a specific learning disorder.

The child may have severe difficulty in particular areas which are evident on standardized test of achievement and in spite of adequate therapeutic efforts there may not be any significant improvement in his difficulty. Such a child may be recognized as having a specific learning disability.

D) COURSE AND PROGNOSIS

The course and prognosis basically depends on the severity of the disorder. There are children with very severe problem (specific learning disability) who in spite of lots of efforts and remedial education show very little or very slow improvement. While there are other children with relatively less severe problem (specific learning difficulty), who show remarkable improvement with very little efforts.

By and large children with specific arithmetic disorder may respond better to therapeutic efforts than children having specific reading and writing disorder. This probably due to the fact that in arithmetic once the concept is acquired the individual would be able to solve all the sums based on that concept while in reading and writing there are no such rules and each rule has exceptions.

V. What are the co-morbid & associated problems one should look for?

A. ADHD

The most common co-morbidity associated with specific learning disorder is Attention Deficit Hyperactivity Disorder (ADHD). Almost 20-25% of the children with Specific Learning Disorder may have co-morbid ADHD. As suggested earlier both these disorders may have common etiological factor - brain insult. It is very important to detect this co-morbidity and treat it simultaneously with appropriate medications and behavior therapy.

B. ODD

The other disorder which may be found frequently, though not as frequently as ADHD, is Oppositional Defiant Disorder (ODD). These children may make various unreasonable demands and throw temper-tantrums if their demands are not met with. Initially when the parents are not aware about SpLD, they may promise various incentives to their child for completing the books or the home-work. After sometimes this may become a habit and child may start demanding unreasonable things for any study related activities which if not met would result in temper-tantrum.

C. OVERANXIOUS DISORDER OF CHILDHOOD AND ADOLESCENT (GENERALIZED ANXIETY DISORDER)

Some children due to fear of poor performance and subsequent punishment or humiliation may develop severe anxiety related to their performance in exams. Few days before the exams they may not be able to fall asleep, develop headache, vomiting or other somatic complaints and may seek repeated reassurance about their performance from the parents.

VI HOW TO ASSESS THESE CHILDREN?

A. Physical examination and evaluation of visual acuity and hearing

Whenever it is suspected from the clinical history that the scholastic difficulty in reading or writing may be due to some physical problem (e.g. weakness in muscles (myopathy) or writer's cramps) or due to refractory errors (myopia) or hearing impairment it should be appropriately investigated. These factors may either independently or in association with specific learning disorder contribute to the child's scholastic problems.

B. Intellectual capacity (Intelligent Quotient, IQ)

Intellectual capacity of the child should be assessed in order to establish that the child has normal intellectual capacity and he does not have borderline intellectual capacity (i.e. slow learner). A rough clinical estimate may be arrived at by checking out the developmental milestones (motor, social, adaptive and language) of the child.

One of the most widely used tests for assessment of intellectual capacity is WISC (Indian adaptation) (Wechsler's Intelligence Scale for Children). This test gives us idea about verbal IQ, Performance IQ, Global IQ as well as Quotients on 12 different Tasks. In normal children, usually, the verbal IQ score is higher than the performance IQ score but in children with specific learning disorder the performance IQ may be more than verbal IQ or there may be a discrepancy of 15-20 points between verbal and performance IQ. One may also see a specific pattern on task quotients which is described as ACID-profile which means that these children may score low on subtask of Arithmetic, Coding, Information and Digit-span. A child with arithmetic disorder may show low scores on a subtest of arithmetic. A child with reading and writing difficulty may score low on 'digit symbol' subtest. Low scores on 'picture arrangement' and 'mazes' are suggestive of poor planning abilities while poor visuo-spatial skills may be reflected by low score on 'block design'.

WISC Test Profile (Age: 9 years 2 months) (4+ Standard) (Showing ACID profile)

Verbal	Raw Scores	Scaled Scores	Performance	Raw Scores	Scaled scores
Information	10	05	Picture completion	10	12
Comprehension	11	13	Picture arrangement	17	13
Arithmetic	07	06	Block design	18	14
Similarities	15	16	Object assembly	19	16
Vocabulary	30	15	Coding	29	09
Digit Span	07	06	Mazes	08	09
Total	61	73			
Verbal IQ		101			116
Full Scale IQ = 109					

Can children having borderline intellectual capacity or for that matter children with mild mental retardation have specific learning disorder is a debatable issue. Conceptually, if one can demonstrate that the reading or writing abilities are substantially lower than expected as per the child’s intellectual capacity than even child having borderline or low IQ may be diagnosed to have specific learning disorder in addition to borderline intellectual capacity or mild mental retardation. For example, if the child is 12 years old; his IQ is 75, i.e. his mental age is 9 years; and his reading age is 7 years; then he may be considered to have specific learning disorder in addition to borderline intellectual capacity as his reading age is 2 years less than expected for intellectual capacity.

If the WISC is not available then one may use other standardized IQ tests like Kamat-Binet Test or Raven’s Progressive Matrices to assess IQ.

C. TESTS TO ASSESS THE READING AGE, WRITING AGE AND ARITHMETIC AGE

Schonell’s tests for reading, writing and arithmetic (Schonell’s ‘graded word vocabulary test’, ‘graded spelling test’, ‘oral reading comprehension test’, etc.) or any other similar standardized tests such as Wide Range Achievement Test (WRAT / WRAT Expanded / WRAT-3 Tan Form / WRAT-3 Blue), Woodcock-Johnson III Tests of achievements (WJ-III),_ (Measure individual academic achievement in reading, mathematics, written language & knowledge, Areas Tested: Reading - comprehension, vocabulary, basic skills, phonics & word attack; Mathematics - computation, reasoning & application of basic skills; Language - knowledge, skills, expression, punctuation, spelling, grammar; Knowledge - general science, social studies, humanities), the Kaufman Achievement Tests (Kaufman Survey of Early Academic Language Skills (K-SEALS). The K-SEALS is an individually administered measure of children’s language skills, pre-academic skills and articulation. Both expressive and receptive language skills are assessed. The pre-academic skills evaluated include knowledge of numbers, number concepts, letter and words. Kaufman Test of Educational Achievement with Updated Norms (K-TEA NU). The K-TEA is an individual achievement test), Peabody Individual Achievement Test-Revised (PIAT-R), (The PIAT-R is an individually administered achievement test for children ages 5 years to 18 years, 11 months old, providing assessment in six content areas: General Knowledge, Reading Recognition, Reading Comprehension, Mathematics, Spelling and Written Expression),

Wechsler Individual Achievement Test (WIAT) (It offers standard scores, percentile ranks, and other scores, based either on the student's age (four-month intervals through age 12.3, one-year intervals for ages 14 through 19) or the student's grade), or Test of written language (TOWL-3) may be used for assessing the reading, writing and arithmetical abilities. If reading age is significantly (2 years or 2 standard deviation) lower than the chronological age or lower than expected reading age as per the IQ than one may entertain the diagnosis of specific reading disorder. Similar norms may be applied for writing and arithmetic abilities as well.

Wide Range Achievement Test (WRAT-3) (Age: 14 years 2 months) (9th Standard)

	Raw Score	Std. Score	Percentile	Grade score	Classification
Reading	43	103	58	High School	Average
Spelling	38	105	63	High School	Average
Arithmetic	36	92	30	VII std	Below Average

Report of a 10-year-old child in 5th standard on a TOWL-3

Subtests	Raw Scores	Percentile	Standard score	Remarks
Vocabulary (VO)	3	9	6	Below average
Spelling (SP)	1	16	7	Below average
Style (ST)	0	5	5	Poor
Logical Sentence (LS)	1	1	3	Very poor
Sentence combining (SC)	1	25	8	Average
Contextual conventions (CC)	1	16	7	Below average
Contextual language (CL)	3	5	5	Poor
Story construction	1	5	5	Poor

D. Syllabus Based Tests for reading, writing and arithmetic abilities

Since standardized tests in all the different Indian languages and for different syllabi (SSC, ICSC, CBSC) may not be available, one may prefer to use syllabus based tests such as syllabus based test used at LD-Clinic of Sion Hospital, Mumbai, or NIMHANS dyslexia battery. Clinically one may assess the child on his school syllabus. For example if the child is studying in 7th standard, it is expected that he should be able to read 7th standard language textbook (*Balbharti or Kumarbharti*) easily and fluently. To assess child's reading age ask him to read 7th standard language textbook and if he can't read it easily and fluently, ask him to read lower standards (6th, 5th, 4th) textbooks to establish his highest reading level. Same method may be used to establish writing and

arithmetic age.

E. Other tests used for the assessment of a child who is suspected to have SpLD

1. DOMINANCE / LATERALITY / KNOWLEDGE OF LEFT-RIGHT / ASTON INDEX

In this test student is required to do number of tasks which indicates the laterality or side dominance

Dominance and Right-left orientation (Age: 5 years 6 months)

Eyes	Right dominant
Ears	Right dominance
Hand	Left dominant
Foot	Right responses

Left-right orientation He could indicate right-left on himself as well as on persons and objects opposite to him

2. PERIN'S SPOONERISM TASK

Spoonerism is a pronunciation error in which initial sounds of 2 words are Tans-pronounced (Transposed). For example: Key-Chain is pronounced as Chey-Kain, Tea-pot as Pea-Top and Post-Card as Cost-Pard

3. MARTIN TURNER NON-WORD DECODING TEST

Inability to read (decode) nonsense (non-word) words demonstrates the grapheme to phoneme translation difficulties.

4. PHONEME-GRAPHEME-PHONEME TEST

This test checks whether one understands the difference between 'letter names' and 'letter sounds'. For example: consider letter 'W'. The letter name is 'double-u' but letter sound is 'va'. Similarly consider letter 'R'. The letter name is 'are' but letter sound is 'ra'.

5. VISUAL DISCRIMINATION TASK

This test assesses the ability to discriminate the visually similar looking letters or words as well as the strategies used to support them.

Generally an object remains the same object whether it is upright, upside-down or sideways. A pencil held upright or upside-down or sideways would still be recognized as pencil. Similarly many letters if turned upside down or sideways still be recognized as the same letters – for example: 'A' small or big, upright or upside-down or seen in mirror will still be called as 'A'. But 'n' when turned upside-down becomes 'u' and the mirror image of 'b' is 'd'.

6. ROBIN-HEDDERLY WRITING SPEED TEST

Student is asked to write as many letters of alphabet (a, b, c, d, e, f.), as fast as he can, in one minute. An adult can write about 85-115 letters in a minute.

7. MICHAEL LOCK ONE-MINUTE READING TEST

Student is asked to read as many words as he can in one minute. His age equivalent reading-speed is scored. For example: Raju, a 14 years old student of 9th standard could read 93 words per minute. His reading speed age

equivalent is 11 years.

8. BANGOR DYSLEXIA TEST

This test is used as a quick screening device to find out whether the student's learning difficulties are typical of dyslexia or otherwise.

Test report of an 8 year old student studying in 3rd standard suspected to have dyscalculia

Indicators	Responses	Results
Left-right	He was able to indicate right-left on himself and on a person sitting opposite to him	Negative
Polysyllables	He could repeat polysyllabic words	Negative
Subtraction	He had difficulty in calculating mentally	Positive
Multiplication tables	He could not recite multiplication tables	Positive
Months forward	He could say months of the year in correct sequence	Negative
Months backwards	He could say months of the year backward in correct sequence	Negative
Digit forwards	Could repeat 5 digits forward	Negative
Digit backwards	Could recall 3 digits backward	Partly positive
'b' / 'd' confusion	Mirror writing reported	Positive
Family history	Mother had problems in arithmetic	Partly positive

9. BENDER VISUAL MOTOR GESTALT TEST (BG TEST)

BG Test is used to detect difficulties in visuo-motor coordination

Child is given 9 abstract designs to copy. The number of errors (For example: change in angulations, distortion in shape, rotation, preservation) in copying are scored. Based on the score the child's Perceptual age (developmental visuo-motor coordination age) is established. Rani, a 7-year-old, 3rd standard student earned a Koppitz Error Score of 12 on BG Test. Her Perceptual age is around 5 years which is 2 years below her chronological age.

10. ANN ARBOR LEARNING INVENTORY

This test is designed to determine the task competencies, task deficiencies and the nature of these deficiencies. It assesses the following tasks:

- a) Visual discrimination skills for difference and likeness in words, phrases and numbers
- b) Visual sequential memory skills for matching words and phrases

- c) Visual sequential memory skills for numbers and letters
- d) Visual motor co-ordination skills
- e) Auditory discrimination skills
- f) Auditory sequential memory skills for phrases and sentences
- g) Auditory sequential memory skills for letters (Written)
- h) Auditory sequential memory skills for words
- i) Auditory sequential memory skills for numbers (Written)
- j) Auditory classification skills
- k) Auditory association skills
- l) Auditory-visual critical thinking skills

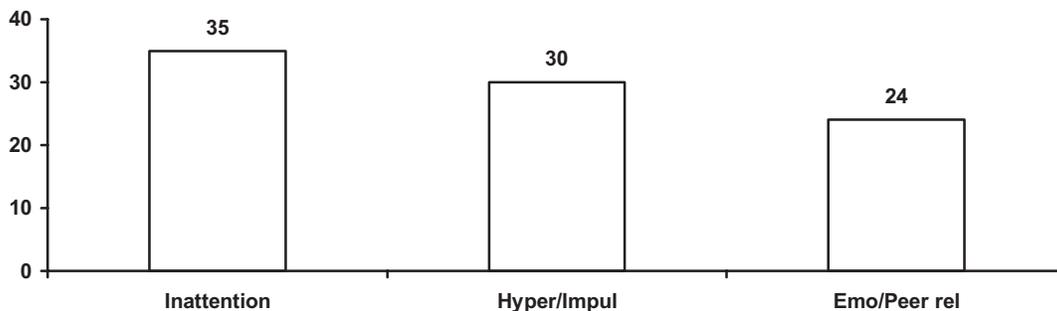
11. FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION

The Frostig Developmental Test of Visual Perception (DTVP) is a test designed to assess visual perceptual skills in children. It provides information that includes a) an estimation of the overall visual perception ability of the child and b) a delimitation of the distinct visual perception difficulties in need of training. The five DTVP subtests are presumed to measure five distinct sub-areas of visual perception: Eye Motor Coordination, Figure Ground, Constancy of Shape, Position in Space, and Spatial Relationships. Raw scores are obtained for each of the subtests and then converted to Age Equivalents or Perceptual Ages (PAs) and Scale Scores (SSs). The total test results are expressed in Perceptual Quotient (PQ) and percentile rank scores.

12 CHECKLISTS FOR ADHD

It is an informal checklist with items to check attention concentration abilities, hyperactivity-impulsivity and emotionality-peer relationship. Each item is rated from 0 (not at all) to 4 (all the time) based on the response from parents and teachers. Score of 0-10 is considered not significant; 11-20 suggest mild problem while 21-30 and 31-40 reflects moderate and severe problem respectively.

Graphical representation of scores on ADHD checklist



F) SCREENING AT SCHOOL LEVEL USING STATISTICAL METHOD

One of the clinical features of children having SpLD is that they may show a marked discrepancy in their performance in different subjects i.e. they may show uneven performance in different subjects. A student having dyscalculia may score around 80% in other subjects but may score only 50% in arithmetic. In this computer era most of the schools have their results on computer. Using a statistical method based program one can detect the children who show discrepancy in their performance in different subjects.

	English	Hindi	Marathi	Arithmetic	Social science	Science
Marks obtained by the student	70	60	54	50	75	72
Mean of the class	60	60	66	80	60	65
SD of the class	10	8	8	15	10	7
Z-Score	1	0	-2.5	-2	1.5	1

* Z-Score = (Marks obtained by the student – Mean marks of the class) / SD of class

Calculate the Mean and SD of the individuals Z-Scores and find out the subject Z-Score which is beyond 2 x SD of the mean Z-Score. In the above example the Z-Scores in Marathi and Arithmetic are much lower than the Z-Scores in the other subjects. It means that this student is likely to have SpLD in Marathi and Arithmetic.

VII. WHAT ARE THE DIFFERENTIAL DIAGNOSES WHICH ONE NEEDS TO KEEP IN MIND?

It is important to keep following differential diagnoses in mind while evaluating these children and rule them in or out by taking meticulous history, physical, neurological, vision and auditory examination and appropriate psychological and education test before confirming the diagnosis of specific learning disorder

A. Borderline intellectual capacity

The child with borderline intellectual capacity is usually confused with the child having specific learning disability. The child with borderline intellectual capacity may present with difficulty in reading and writing, and poor scholastic performance. His difficulties are more general and are due to his borderline intellectual capacity. These children are also called “slow learners.

B. Mental retardation

The child with mild mental retardation may also present with poor scholastic performance and repeated failures in school. When clinically it is difficult to differentiate, the performance on tests of intelligence, i.e. child’s IQ, may resolve the problem. The mentally retarded child would have an IQ below 70.

C. Pervasive developmental disorder

One of the most striking clinical features of children having pervasive developmental disorder is very poor language development. It may have to be differentiated from receptive and expressive language disorders. Pervasive developmental disorders are relatively rare and with the other associated features it is usually not difficult to differentiate them from receptive and expressive language disorders.

D. Language problems / Discrepancy between mother-tongue and language of schooling

Sometimes one may get an impression that the child is not able to do well in his studies as his mother-tongue may not be English or nobody in the home speaks or understands English. In this kind of situation generally the child would not be able to speak English fluently and may make more grammatical mistakes but he would be able to write fast and complete his books.

E. Inadequate facilities for schooling

Once in a while, when a student who has studied in a less sophisticated village school and then gets an admission in a more sophisticated city school, he may show poor performance in city school in spite of being intelligent. This may be due to lack of adequate facilities in the village school. This may also be noticed when the child is shifted from one board to other board i.e. from SSC-board to ICSC or CBSC board. Most of the time, this kind of difficulty is only during the first couple of months and most of the intelligent children are able to overcome this problem over next few months.

F. Hearing or visual impairment

Rarely, it may happen that a child is slow in writing and unable to complete his books due to hearing or visual impairment. This can be easily corrected by appropriate glasses or hearing aids.

G. Neurological deficits such as myopathy

The difficulty in writing may be secondary to neurological problem such as myopathy. In this kind of situation parents may be asked to take a certificate of physical disability to take advantage of concessions.

H. Writer's cramp

In writer's cramp the student starts getting pain and spasms in hands after writing for sometimes. Students having writer's cramp are also entitled for a writer in exams.

VIII HOW TO MANAGE THESE CHILDREN

The management of this disorder needs a team work. The team may consist of a psychiatrist, a clinical psychologist, an educationist, a special remedial educator, a pediatrician, an occupational therapist, a speech therapist etc.

A. Counseling & psycho-education of students, parents and teachers.

Unfortunately awareness about this disorder amongst parents and teachers is not very high. Many parents think that the child is lazy and is not interested in studies and therefore avoids reading and writing. So they may try their own method of reward and punishment to improve the child's reading and writing without realizing that it is a kind of disorder and in spite of their genuine and persistent efforts it may not improve. This may lead to frustration, disappointment and secondary problems. Therefore it is very important that parents and teachers are well informed about this disorder so that they can work with the therapists and help the child having specific learning disorder. It is also important to do counseling with the child and help him to understand his difficulty and explain him the need for intervention to get his maximum cooperation in the implementation of program.

Following areas should be addressed during a counseling session with students, parents & teachers.

1. The parents and teachers should be explained the concept of SpLD. What is SpLD and how it is different from other learning problems. It is important to explain that it is not that the child is lazy or not interested in the studies but it is a disorder due to which he is unable to cope up with his studies.

2. Punishing or ridiculing the child does not help, it only increases the problem. Not everything is lost if the child is not doing well in school because of S.L.D. There are some great and highly accomplished people in this world that had S.L.D. Some examples: Einstein, Thomas Alva Edison, Leonardo da Vinci. Recognize and develop the talents, skills, potentials, and assets that your child has. Give attention to overall personality development.

3. With remedial education some of the problems may improve. As it is a type of disability, children having SpLD should be provided with recommended concessions. With these concessions they are likely to do well and progress in their academics otherwise many of them would be school dropouts.

4. There are no medications or any other medical therapeutic procedures which have been found to be useful in the treatment of this disorder.

5. The most common question asked by the parents during a counseling session is 'why their child has developed this disorder?' This question may be answered as follows.

a. Brain dysfunction

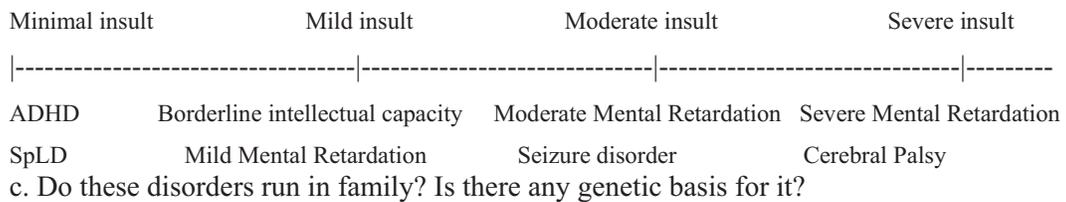
We do not know 'why some children develop these disorders?' or 'what is the pathology of these disorders?'

But it seems that the areas of the brain which are responsible for our reading, writing and arithmetic abilities may be lagging behind in development and so are not functioning optimally, as per their age, in children having these disorders. So at present it seems that these disorders are due to dysfunction of certain areas of brain and so was the terminology ‘minimal brain dysfunction’.

b. Brain insult

The next question is why some areas of brain are lagging behind in development or what causes the dysfunction? It is likely that it may be due to some insult like hypoxia or hypoglycemia to the brain either during intrauterine life or at the time of delivery or during early life after birth. Depending on the nature, extent and severity of insult one may develop different types of neuropsychiatric disabilities. For example, at one end of the spectrum if the insult to the brain is minimal then one may develop disorders like ADHD or learning disorders; a more sever insult may cause mental retardation or seizure disorder; and very severe insult may lead to a very severe disorder like cerebral palsy which is at the other end of the spectrum.

Figure-1



c. Do these disorders run in family? Is there any genetic basis for it?

Yes and No. Clinically, in some cases you may find one of the parents or sibling with similar difficulty but in many others it may not be so.

d. Cerebral laterality (two left hands)

During early development children start using one hand more dominantly than the other. By the age of 3 years children develop handedness and are no longer ambidextrous. Most of the children develop their right hand as dominant hand i.e. they become right-handed. It means that their left hemisphere of the brain is dominant.

Since most of us are right handed, we are able to write easily and effortlessly with right hand. But suppose we try to write with our left hand, it would be very difficult for us to do so. We will be very slow, it won't be easy and writing with left hand would tire us quickly. It seems that children having specific learning disorder have two left hands. So writing for them is as difficult task as it is for us when writing with our left hand.

Try writing few alphabets ‘A, B, C, D’ with your right and left hand simultaneously naturally, spontaneously without becoming conscious. What you would observe is that alphabets written by your left hand are mirror image of the alphabets written with your right hand. It shows that probably the right hemisphere of brain stores the mirror images of things stored in left hemisphere of the brain. No wonder, due to problems in development of cerebral laterality, these children read and write mirror images of the letters or words. For example they write ‘b’ for ‘d’ as ‘bog’ in stead of ‘dog’ and read ‘saw’ for ‘was’.

6. Child counseling: Tell the child about S.L.D. in simple terms. Child should understand that having this problem is not his fault. Child if often relieved when we tell that he has genuine difficulty in learning, and that it is not his fault that he is not doing well in school. Try to instill confidence in the child that there are ways of facing this problem. Counseling also needs to focus on countering the secondary loss of motivation, which is often present, and for building up motivation to do remedial work. Be ready to handle the emotional problems and behavior problems, which are often present.

B. Tricks and deceptions

Over a period of time some of these children develop their own ways and means to overcome their difficulties in reading and writing. For example, they may read by guessing the word, they may substitute difficult words by simpler words, write in point forms, disguise their spelling mistakes by bad cursive handwriting.

C. Remedial education

The most specific treatment modality which may be utilized for children having SpLD is remedial education. Depending on their difficulties in different areas like motor, sensory, perceptual, reading, writing, arithmetic etc., various techniques of remedial education may be utilized.

Remedial education may be very useful in the early school year i.e. in nursery, kindergarten, 1st standard and 2nd standard. The improvement with remedial education may be a slow and steady process and may take couple of months to a couple of years. It is not based on school syllabus and therefore the improvement may not be reflected in school performance immediately as per the parent's expectations. Usually the remedial educator takes about 2-3 sessions per week.

53 basic learning abilities have been identified. These abilities have been grouped under 6 major developmental learning areas as follows.

Developmental Learning Areas	Basic Learning Abilities
I Gross motor development	1.Rolling 2.Sitting 3.Crawling 4.Walking 5.Running 6.Throwing 7.Jumping 8.Skipping 9.Dancing 10.Self-identification 11.Body localization 12.Body abstraction 13. Muscular strength 14.General physical health
II Sensory motor integration	15. Balance and rhythm 16.Body-spatial organization 17.Reaction-speed dexterity 18.Tactile discrimination 19.Directionality 20.Laterality 21.Time orientation
III Perceptual motor skills	22.Auditory acuity 23.Auditory decoding 24.Auditory-vocal association 25.Auditory memory 26.Auditory sequencing 27.Visual acuity 28.Visual coordination and pursuit 29.Visual-form discrimination 30.Visual figure-ground differentiation 31 Visual memory 32.Visual-motor memory 33.Visual-motor fine muscle coordination 34.Visual-motor spatial-form manipulation 35.Visual-motor speed of learning 36.Visual-motor integration
IV Language development	37.Vocabulary 38.Fluency and encoding 39.Articulation 40.Word attack skills 41.Reading comprehension 42.Writing 43.Spelling
V Conceptual skills	44.Number concepts 45.Arithmetic process 46.Arithmetic reasoning 47.General information 48.Classification 49.Comprehension
VI Social skills	50.Social acceptance 51.Anticipatory response 52.Value judgment 53.Social maturity

The child is given various exercises to develop his learning abilities in the above mentioned areas.

There has been a lot of progress in the recent years in this area, and several systems of remediation are available. Though this is the arena of special educators, psychiatrists should be aware of basic principles of remediation. Some of these are mentioned below.

1. Remediation has to be sympathetic, at a rate at which the child is most comfortable, and with a lot of patience.
2. It should be
 - Structured: organized, coherent rather than random, and linked to present attainment
 - Sequential: step by step from simple to complex
 - Cumulative: gradual build-up of language processing, and
 - Thorough: each stage to be fully learnt before moving to the next
3. Over-learning is required at each step.
4. Most systems follow multi-sensory approach, involving vision, hearing and touch.
5. Phonological processing approach, which means that these children have to be coached in development of sound – symbol correspondence (getting to grips with sounds) is now considered as the sheet anchor in remediation. For example, child is taught that the letters ‘a’ and ‘r’ are needed to make the sound /ar/, and that the sound of the letter ‘t’ can be joined to produce the sound /tar/. This phonologic processing is further augmented with orthographic (visual symbol) processing.
6. Behavioral methods such as use of rewards, differential reinforcement, behavioral contracting are quite useful in maintaining motivation.
7. Non-conventional methods of teaching such as flash cards, charts, educational toys, and word games are beneficial.

Some of the other techniques used are as follows.

1. ORIENTATION IN SPACE

For example, for very young children in kindergarten or 1st or 2nd grade, who have problems in orientation, one may start with developing right-left and up-down orientation. If one puts semicircle on the down and right side of a standing line it is ‘b’ while a semicircle on down and left side would be ‘d’. On the same line semicircles on up and right side and up and left side would respectively be ‘p’ and ‘q’. Thus the child would learn to differentiate commonly mistaken letters ‘b’, ‘d’, ‘p’ & ‘q’.

2. PHONEMES AND GRAPHEMES

As mentioned earlier many children may have difficulty in differentiating the letter name from letter sound. Various special techniques may be utilized for these children. For example in a word ‘cat’ it is ‘c + at’ which is pronounced as ‘k’ + ‘at’. Thus here the letter name for symbol ‘c’ is ‘see’ but letter sound is ‘k’.

3. WORD READING

Let the child read words as a whole like we read symbols and not as made up of few letters. The symbol ‘\$’ is read as dollar and symbol ‘%’ is read as percent. To encourage word reading, make labels and put them on common objects in the surrounding. For example ‘cupboard’ ‘table’ ‘wall’ ‘clock’ ‘bathroom’ etc. The child learns to read these words as a whole by repeated looking at them rather than as a group of letters in the word.

Children as young as 2 years old can be taught to read with this technique. For this, step-1 is - some common simple words are printed on a big white cardboard. For example

daddy

mummy

Show these words to the child one at a time and say these words loudly and clearly. Once the child has learned to read these words then as step-2 - show him 'self' vocabulary words such as hand, nose eyes etc.

Subsequently in the similar manner (step-3) teach him 'home - vocabulary' words (which include: words describing family members - brother, sister, baby; home furniture - table, chair etc. utensils - plate, cup etc. doing or action words - sitting, standing etc.).

hand

eyes

nose

Once the child has learned to identify these words then put these words together 2 or 3 at a time to make short sentences & phrases (step-4,5) such as 'I am sitting'.

Finally (step-6) give him a story book (prepared for his age) to read.

Now (step-7) one can teach him alphabet as well. It will be much easier for him to learn alphabets now!

4) If I can't learn the way you teach, teach me the way I can learn

A) READING AID

- i) Tell the children having SpLD the story or the concepts discussed in the chapter orally before they read it so that they have at least some idea of what they are going to read.
- ii) Make a précis or summarize the essential points which he needs to understand in a given reading material.
- iii) Substitute the difficult words in the paragraph or text with simpler words. Similarly change the compound and complex sentences to short and simpler sentences which are easy to read and understand.
- iv) Illustrate the matter with pictures, diagrams, flow-charts tables etc.
- v) Put headings and sub-headings in the reading material.
- vi) Appreciate, praise, encourage and reward his reading efforts. Avoid humiliation and criticism.
- vii) Readout the chapter to him. Explain using gestures, examples. Ask him to form a mental image of the matters readout to him.
- viii) One may read and record the chapter on the audio cassettes so that he can listen to it as and when he wants it.

B) WRITING AIDS

- i) Do not force him to write

- ii) Let him write at his own speed
- iii) Let him write in point forms instead of full sentences (SMS language)
- iv) He may be allowed to answer in one word or write only the answer in 'fill in the blanks' instead of writing the full sentence
- v) Allow someone else to write on his behalf. Allow writer in exams
- vi) Allow him to type or use computer for writing work
- v) Give him more time to complete his books and papers in exam

C) ARITHMETIC AID

- i) Do not insist on mental arithmetic. Allow him pen and paper
- ii) Allow use of calculator or Table-book
- iii) Demonstrate with concrete examples e.g. instead of what is 5×3 one may show him how many students would be able to sit in a class if we put 5 students per row in 3 rows?

St	St	St	St	St
St	St	St	St	St
St	St	St	St	St

- iv) Demonstrate with actual money transaction. E.g. Take 10 coins of Rs.1 each. Ask him to give 3 coins (Rs.3) for buying a pen. Ask him 'how many are remaining?'
- v) Try to explain the concept using different method in different style more than a couple of times till he gets the concept
- vi) Higher class allow him to substitute arithmetic by some other subject of his choice

5. Speech and language therapy

Various types of speech and language therapies have been found to be useful for children having receptive, expressive and articulation language problems.

D. Therapy for associated problems

As many of these children may have other psychiatric disorders like attention deficit and hyperactivity disorder (ADHD), they should also be treated for the conditions concomitantly. Drugs like methylphenidate, magnesium pemoline, atomoxetine, amphetamine salts etc. have been found to be useful in children suffering from ADHD. In younger children, play therapy may be very useful for other associated behavioral problems.

E. Self help groups

Parents of these children can form self help groups. These groups can meet regularly and discuss common problems and their solutions. They can also help school authorities to start special classes for these children. In addition, they can make a representation to the education department for special concessions which these children can be given, if their disability is severe and incorrigible.

F. Concessions

Following concessions have been recommended and given to students having SpLD

1. More time (25% more / 15 minutes per hour) to complete the books and exam papers.
2. Condon spelling mistakes
3. Objective type of exam papers
4. Promotion based on oral exams
5. One language less
6. Lower standard arithmetic
7. Use of calculator
8. Other substitutes subjects / work experience
9. Provision for a writer

G. OTHER OPTIONS FOR SCHOOLING AND CAREER OPPORTUNITIES

1. National open school

National open school offers a different syllabus to the children having either SpLD or borderline intellectual capacity. They have only 5 subjects and the questions in exam papers are objective types which these children can solve easily. A student can attend a school offering this syllabus and go up to 12th Standard after which he can enroll for any of the regular courses like F.Y.B.Com. (First year Bachelor of commerce) or F.Y.B.A. (First year Bachelor of Arts).

2. Prevocational And Vocational Training Programs

Many students may prefer to take up vocational courses after 8th, 10th or 12th standard. A variety of courses like machine-operator, refrigerator and air-conditioner mechanic, fashion designing, tour and travel operator, hotel management etc. are available.

3. Decisions about education

This is the most difficult part of management, and requires careful consideration of many factors such as child's age, severity of S.L.D., gap between current class and actual ability of the child, medium of instruction, current syllabus, availability and affordability of specialist services, and so on. Decisions about which school, class, medium, or syllabus and about promotion to higher class are very vexatious. A decision that is most appropriate for a given child needs long negotiations with the child, parents, and the school. The following are some options, which could be considered:

- a. Enrolment in National Open School, which allows the child to pursue his education at his pace. (The local contact address in Bangalore is Al Ameen College, Hosur Road).
- b. A shift to medium of instruction in mother tongue could be more appropriate if the child is in first or second standard. Indian languages have high sound- symbol correspondence and therefore easier to learn.
- c. Continuation in normal school in a class which matches with the child's attainment, with extra inputs outside the school hours
- d. Other possibility is that child attending a normal school and allowing time for Remediation.
- e. Karnataka government has passed a resolution that S.L.D. children can be granted exemption from second and third languages at SSLC level; there is also provision for using a scribe while writing examinations.

- f. Change to a school, which is aware of this problem, and with facilities for Remediation is useful in some circumstances.

IX. REFERENCES

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