

Understanding Dyslexia and Multiple Intelligences

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Dyslexia is the most common learning disability which occurs in one in ten school children. In fact, the numbers may be more, as high as 20 percent, since there is no statistical data available for India. Children with dyslexia, unlike other disabilities, do not have any physical 'marks' or attributes. Hence, it is an *invisible* disability.

Dyslexia does not affect the intelligence of the child, therefore, most of the time such children are termed 'lazy, stupid, duffer' and suffer the consequences of bullying in school, parental wrath and teachers' disdain. As a result, the child suffers from low self-esteem, exhibits destructive behaviour and picks on children younger than themselves.

Children with dyslexia, also known as *Specific Learning Disability*, (SLD) have average to above average intelligence and they are highly creative. If they do not receive timely intervention they may drop out of school and become social delinquents.

What is dyslexia?

Dyslexia is not a disease. It is a neurological condition where the brain processes information differently. According to the Rights of Persons with Disabilities Act, 2016 (Clause 2a of Section 2, page 34), dyslexia or SDL means, '... a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia.'

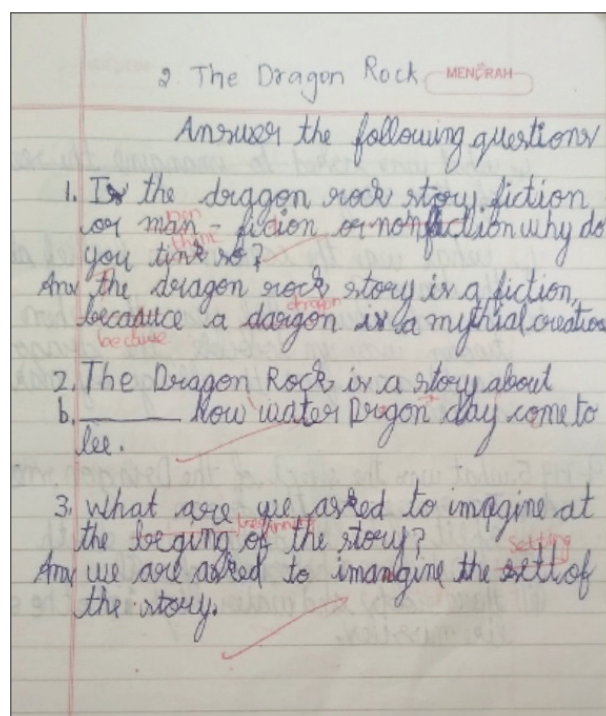
'Dyslexia is a brain-based type of learning disability that specifically impairs a person's ability to read. These individuals typically read at levels significantly lower than expected despite having normal intelligence.' (National Institute of Neurological Disorders and Stroke).

Characteristics of dyslexia

Although characteristics are specific to an individual, that is, no two persons with dyslexia show the same traits, there are a few that are common to all.

- Problems with processing sounds – *pot* instead of *pet*
- Inability to spell – *powdr* instead of *powder*
- Reading letters in reverse; confusion in order of letters – *b* and *d*, *form-from*
- Trouble reading longer words
- Omitting or misreading words – *play* for *playing*, *every* for *earth*
- Inability to complete classwork
- Difficulty in copying from blackboard
- Reading numbers in reverse order; not knowing place values
- Poor sense of time
- Planning, prioritising and organising difficulties

Here are some samples of the English classwork of a grade 5 student with dyslexia. The misspelt words are: *causes*, *town folk*, *dragon*, *expect*, *wall*.



Calculation of accounts; and English classwork of a class 11 student with dyslexia.

P Particulars	Amount
To Bank a/c.	56000
To installation a/c.	24000
To Carriage a/c.	3000
	<u>83000</u>
To balance b/d.	80250
To bank	23000
	<u>16000</u>
	<u>340250</u>
To balance b/d. $\frac{1}{2}$	72625
$\frac{1}{2}$	251333

languages and culture
 = interrelated
 what you don't feed in culture
 you don't be expressed in language
 mouth billing - something very
 difficult to say in english
 culture
 This is a oral narrative
 Asking a question next meant to be
 answered Rhetorical.
 Salvo's answer by himself.
 Shadow -> Trace
 Dangling - Start from one point and
 goes on another.
 Past has now sweet as 70p to
 better another great similarity in
 some way to Mother India

Remediating children with dyslexia

Catch them young

This is the best solution. When children in the lower primary classes are identified to have a learning difficulty and when they are given remedial interventions tailored to their needs, they not only achieve academic success but also become socially well-adjusted.

Train teachers in methodologies of remediating dyslexia

Primary school teachers must be equipped to identify and provide remedial classroom interventions for children with dyslexia. Madras Dyslexia Association (MDA)¹ conducts teacher training programmes for teachers in both government and private schools. MDA also sets up Resource Rooms in schools so that children can be remediated in the school premises itself.

Get assessed by experts

Assessments using standardised tools confirms the presence of dyslexia in an individual. This helps the caregivers ascertain the strengths and needs of the child, allowing them to plan the intervention to help the child cope with the difficulty. All examination boards offer various concessions to children diagnosed with SLD. An assessment will show the

type of SLD the child has, for example, dyslexia, dyspraxia, dyscalculia, dysgraphia, the severity of the disability, co-morbid conditions that exist along with SLD, like ADHD (Attention Deficit Hyperactivity Disorder). The remediation and other therapies required can then become clearer, for example, speech therapy and/or occupational therapy (OT).

What is remedial intervention?

- It is systematic
- It identifies the strengths and needs of the child
- It is individualised
- It is multi-sensory

Dyspraxia, dyscalculia and dysgraphia

Dyspraxia

Developmental dyspraxia is a disorder characterised by an impairment in the ability to plan and carry out sensory and motor tasks.' (Source: National Institute of Neurological Disorders and Stroke). Children who have dyspraxia require occupational therapy and special education.

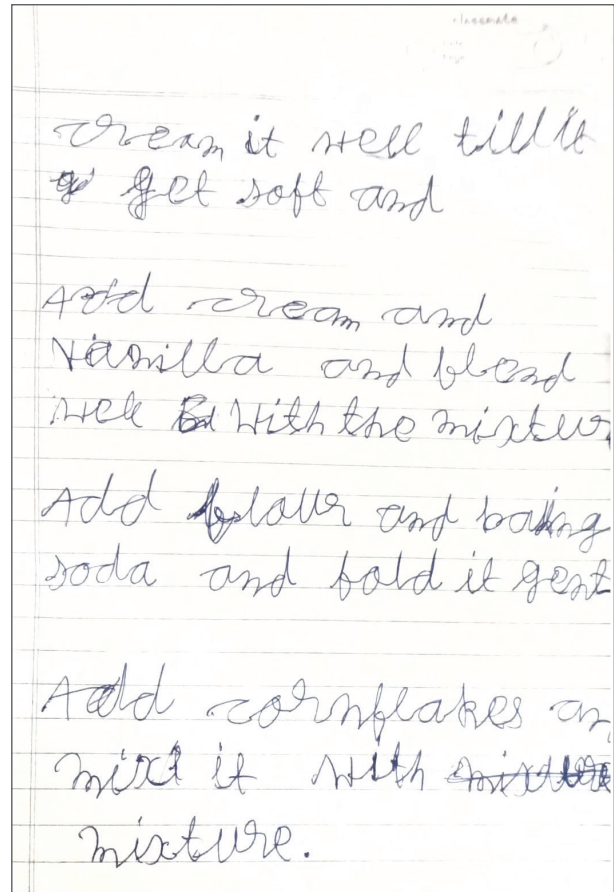
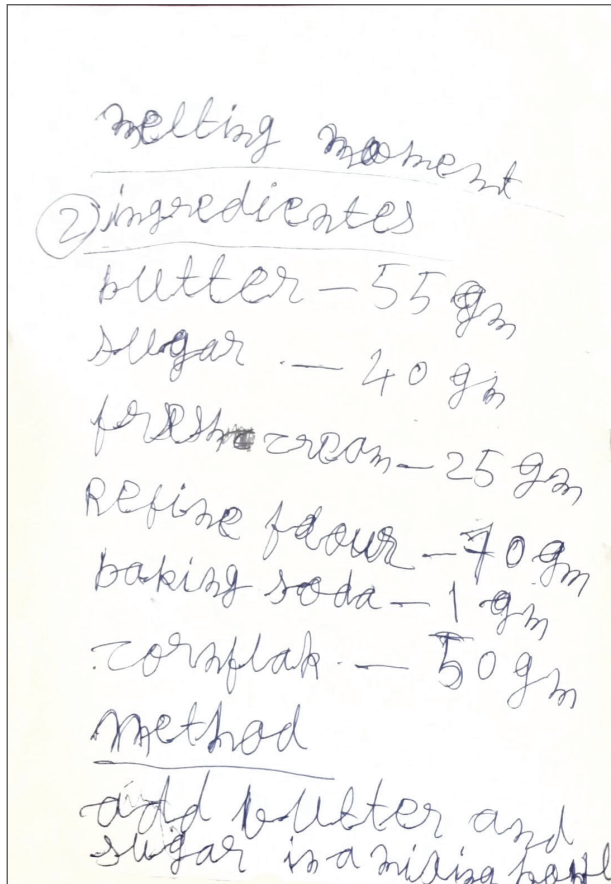
Characteristics of dyspraxia

- a. Poor balance and coordination – tripping and falling easily, banging into people and objects, having problems with right-left coordination.
- b. Clumsiness – dropping things, hand grip is not

- firm, poor handwriting.
- c. Perception difficulties – cannot read maps, difficulty in crossing the road.

- d. Emotional and behavioural problems.
- e. Difficulty with reading, writing and speaking.
- f. Poor social skills, posture and memory.

Baking and Confectionary classwork of a grade 10 student with dyspraxia and dyslexia.



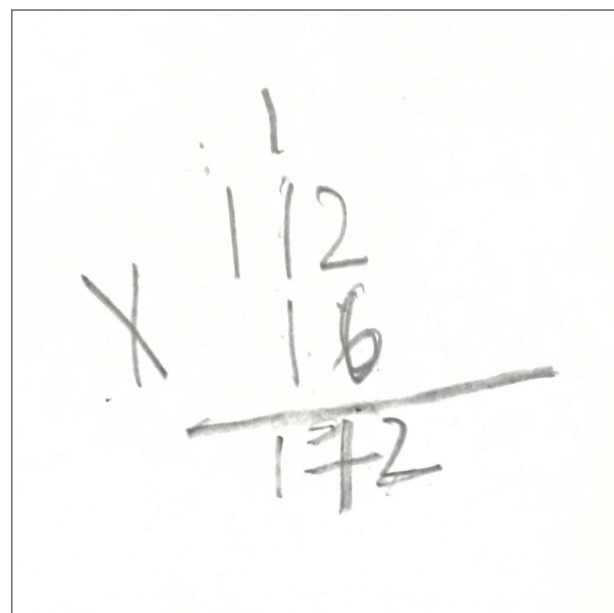
Dyscalculia

Dyscalculia is a disorder which is characterised by the inability to understand the meaning of numbers and an inability to apply mathematical principles to solve problems. (Source: British Dyslexia Association).

Characteristics of dyscalculia

- a. Inability to understand which of two digits is larger.
- b. Lacking effective counting strategies.
- c. Poor fluency in identification of numbers.
- d. Inability to add simple single-digit numbers mentally.
- e. Limitations in working memory capacity.

Multiplication by a grade 10 student with dyscalculia and dyslexia.



Dysgraphia

Dysgraphia is a neurological disorder characterised by writing disabilities. Specifically, the disorder causes a person's writing to be distorted or incorrect. In children, the disorder generally emerges when they are first introduced to writing. They make inappropriately sized and spaced letters, or write wrong or misspelled words, despite thorough instruction. Children with the disorder may have other learning disabilities; however, they usually have no social or other academic problems. (Source: National Institute of Neurological Disorders and Stroke)

What happens when a child is referred for an assessment?

Assessments are scientifically designed tests/tools that experts use to find out what kind of SLD a child has. From the report they generate, the special educator can draw up an Individual Educational Plan (IEP) to remediate the child. The report also shows if the child requires speech or occupational therapy.

Importance of the triumvirate – school, parent, special educator

Research and experience of working with children who have SLD has shown that when these children have a strong backing from the school, the parent and the special educator, they achieve success in academics and in their social life. When all three groups work in tandem and in cooperation, children go on to choose careers where they excel and become adults who are important contributors to society.

Counselling parents of children with SLD

For any parent it comes as a shock when they first come to know their child has a learning disability. Initially they are in denial and take some time to come to terms with the finding. Many times, one parent may cooperate (for example, the mother) while the other parent (for example, the father) may disagree vehemently. It becomes important for the school teacher, the special educator and the principal to counsel the parents, multiple times, so their child may get the best benefits of remedial interventions.

Multiple Intelligences

This is an important tool for teaching children with SLD and is based on Howard Gardner's

theory of Multiple Intelligences (MI). According to convention, intelligence is measured by IQ (intelligence quotient) which tests a person's proficiency in language (linguistic) and mathematical (logical mathematical) abilities. When a child is tested using only these two areas of ability, which is the norm in schools in India, we commit an injustice to other children in a typical classroom. Because individuals learn differently using different abilities. Those children who have difficulty in language (linguistic) and mathematics (logical mathematical) miss out on the learning. Moreover, if all children in a classroom were to acquire learning in a uniform fashion, then the tests and exams they write must also generate uniform results. That does not happen. Learning is unique to the individual. Therefore, teaching and assessments should cater to the learning diversity of a classroom.

Since in practice it is difficult to devise teaching methodologies which cater to the individual needs of a child in a typical classroom, using the MI theory solves the problem. Using it, a lesson can be taught in different ways which will reach the greatest number of children in a classroom. It also encourages multiple perspectives of understanding a problem and deriving solutions. The MI method generates different points of view, encourages group work and peer learning.

What is MI?

For something to qualify as an intelligence, it has to satisfy Howard Gardner's eight 'signs' of intelligence. After extensive research, Gardner identified eight, distinct intelligences. (Source: The Components of MI)

Spatial Intelligence

- a. 'The ability to conceptualise and manipulate large-scale spatial arrays (example, airplane pilot, sailor), or more local forms of space (example, architect, chess player).' (Source: The Components of MI)
- b. Visualises very well, is good with directions, can distinguish between colours, forms, shapes, sizes and their relationships.
- c. This ability is seen in architects, artists, painters, chess players, sailors, hunters, guides, astronomers.

Bodily-Kinesthetic Intelligence

- a. 'The ability to use one's whole body, or parts of the body (like the hands or the mouth) to solve problems or create products.' (Source: The Components of MI)
- b. Characterised by good coordination, balance, dexterity, grace, flexibility, speed in body movements and actions.
- c. This ability is seen in athletes, dancers, sculptors, surgeons, martial art practitioners.

Musical Intelligence

- a. 'Sensitivity to rhythm, pitch, meter, tone, melody and timbre. May entail the ability to sing, play musical instruments, and/or compose music.' (Source: The Components of MI)
- b. Are music lovers can discriminate and judge music forms, compose music, play musical instruments, sing.
- c. This ability is seen in musicians, composers, instrumentalists.

Linguistic Intelligence

- a. 'Sensitivity to the meaning of words, the order among words, and the sound, rhythms, inflections, and meter of words.' (Source: The Components of MI)
- b. Effectively employs words either in speaking or in writing, shows interest in reading and crossword puzzles.
- c. This ability is seen in journalists, authors, storytellers.

Logical-Mathematical Intelligence

- a. 'The capacity to conceptualise the logical relations among actions or symbols (e.g. mathematicians, scientists).' (Source: The Components of MI)
- b. Able to sort and order (in different categories), understands mathematical statements, propositions, functions and complex propositions, capable of making related abstractions.
- c. This ability is seen in statisticians, mathematicians, computer programmers, scientists

Interpersonal Intelligence

- a. The ability to interact effectively with others. Sensitivity to others' moods, feelings, temperaments and motivations (e.g. negotiator). (Sometimes called social intelligence.) (Source: The Components of MI)

- b. Has empathy, social skills, can discriminate between many personal cues, respond effectively to them, inspire people to positive actions and tide over negative emotions.
- c. This ability is seen in social activists, counsellors, politicians, faith healers, effective parents and teachers.

Intrapersonal Intelligence

- a. 'Sensitivity to one's own feelings, goals, and anxieties, and the capacity to plan and act in light of one's own traits. Intrapersonal intelligence is not particular to specific careers; rather, it is a goal for every individual in a complex modern society, where one has to make consequential decisions for oneself. (Sometimes called self-intelligence.) (Source: The Components of MI)
- b. An honest, accurate picture of oneself (strengths and weaknesses) capacity to understand oneself and act adaptively; awareness of one's inner moods and desires and healthy self-esteem.
- c. This ability is seen in philosophers, effective parents and teachers.

Naturalistic Intelligence

- a. 'The ability to make consequential distinctions in the world of nature as, for example, between one plant and another, or one cloud formation and another (e.g. taxonomist). (Sometimes called nature intelligence.) (Source: The Components of MI)
- b. Keen interest in plants and animals, explores nature, use the environment effectively.
- c. This ability is seen in: farmers, botanists, veterinarians, ayurvedic practitioners.

Dyslexia and MI

Children with SLD usually have a unique ability in one or two Intelligences. When that ability is tapped, children tend to perform well academically and socially. For example, if a child has a dominant Bodily-Kinesthetic Intelligence, he or she will learn effectively by using her body and its parts. Such children can create and shape things with their hands in order to learn their lessons. Children with SLD must be encouraged to tap into their dominant intelligence which will be areas they will be exceptionally good at.

Dyslexia and technology

The MDA has invested in using technology to assist children with dyslexia. They have developed the *MDA Avaz Reader App* in collaboration with

Invention Lab, an IIT Madras Alumni venture using cutting edge technology. This is an assistive reading app for a reader with learning disabilities. The app uses state-of-the-art technology, works largely off-line and is available for Apple devices and for the simplest Android device, a tablet or a mobile phone, making it affordable. This app uses technology to translate the text captured as picture into a readable format and can be used to read any printed material – newspapers, textbooks and story books.

The MDA Avaz Reader is reader-centric and offers ‘customisable’ settings to suit the needs of the reader and offers multi-sensory strategies to develop independent reading skills in children with SLD. It is aimed at providing continuous support to a child with dyslexia, playing the role of the supportive teacher even in her absence.

Some of the key scaffoldings provided to the reader in the app include:

- a. Choice of different visual appearance of the text to be read
- b. Window-focus to a specific line, and line-by-line display of text to keep the reader’s attention to the required line.
- c. Pencil tool to track the text to be read.
- d. Read-out-aloud in a familiar accent and with configurable speed.
- e. Need-based picture hints, audio pronunciation, word families and syllabication as appropriate to

read a difficult word.

- f. Build sentence assistance to enhance comprehension.

MDA and training

In their journey to help children with SLD, MDA continues to empower the primary school teacher through its training programmes. In collaboration with the State Government of Tamil Nadu, MDA is training government primary school teachers by sensitising them to SLD, providing identification kits that teachers can administer in their classrooms and imparting remedial techniques and teaching methodologies to the teacher. The primary school remedial content, *E-Shikshnam* is available free of cost on an online platform.

MDA also sets up *Resource Rooms* in schools, where experts from MDA hand-hold special educations in the school for a minimum period of one year. This effort is beneficial to child who will be remediated within the school premises.

Life-long management of dyslexia

Dyslexia is a neurological condition, not a disease and will remain for life. When children are remediated early in the lower primary classes, they learn to develop coping strategies which help them navigate school and college life and, later on, in their careers, relationships and other activities of daily living. Such an individual becomes a proud and contributing member of the society they live in.

¹ The Madras Dyslexia Association (MDA) was established in 1991 by a group of parents and educators who wanted to help children with dyslexia at a time when the term was not very well-known.



Mrudula Govindaraju has an MA in English Literature and is a copy-editor by training. She has worked in the publishing industry for more than ten years and has edited and designed school textbooks for primary school children. She has edited online training courses and created course materials for managerial training programmes. Mrudula also writes storyboards and scripts for online self-learning tutorials. She has taught children with learning differences. At present, she edits the MDA newsletter. She may be reached at govindaraju.mrudula@gmail.com