LEARNING DISABILITY

Topics included in this Section are as follows-

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- Some Personal Experiences

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Students with Learning Problems

Some Key Definitions Including Updates from the DSM-5

- Key Definitions
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Characteristics of a Learning Disability

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Characteristics of a Learning Disability

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    Basic Skills

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OVERVIEW

Because of confusions in the field of Learning Disability stemming from ongoing changes in terminology and definitions and recent developments flowing mainly from the DSM-5, it is necessary to explain my approach in this Section.

I have chosen to keep the term Learning Disability as the heading and the main term throughout this Section. While many of the States in the USA have adopted the DSM-5 changes including terminology-Specific Learning Disorder-and diagnostic criteria, other countries including the UK, Canada and Australia have generally retained older terminology-learning disability, specific learning disability, dyslexia and used different diagnostic criteria.

In Victoria, Australia, the Department of Education and Training's, VCAA has embraced the changed terminology and diagnostic criteria. In their Handbook and the Special Examination Arrangements Application Form, the original term Learning Disability has been replaced by the DSM-5 term Specific Learning Disorder and its diagnostic criteria. Other educational institutions and professional organisations within Victoria have not made the DSM-5 changes nor have all other States in Australia.

So the terms Learning Disability and Specific Learning Disorder will be used interchangeably throughout my website.

In maintaining the established tradition throughout my website, I have kept past definitions and diagnostic criteria to enable the reader to identify earlier positions and see developmental trends. I consider that this is very important in the field of Learning Disability, which has a rich and proud tradition and should not be lost in the new era of relatively rapid changes.

The key topics covered in this Section include-

- Characteristics of a Learning Disability
- Checklists for a Learning Disability

Personal Experiences

My understanding of the characteristics typically displayed by students with a Learning Disability stems from three personal sources.

Firstly, as a special education teacher working in primary schools. Over time, it became obvious that some otherwise bright students were having unexpected problems mastering some basic learning skills in both literacy and numeracy.

Handwriting

Problems were often experienced forming letters correctly. Typically, certain letters were reversed-b, d, p, q, g, s, j, t and sometimes incorrectly fashioned -that is, letters such as s, j, t were produced from the bottom up, not top down. Faulty pencil grip-a common observation- did not help production. Furthermore, when making the transition to cursive or running writing, students had difficulty connecting the letters-often because they had not been formed properly. (An example of underdeveloped fine-motor, sequencing skills).

Many of such students never make the transition and consequently print throughout their school years.

Hence, problems with orientation and sequencing were apparent.

Reading

Developing early reading skills including visual word recognition and auditory word-attack skills, presented huge challenges to some students.

Establishing a knowledge of the alphabet was hindered by several factors-

- an inability to learn the alphabet-difficulties recalling letters after "t" were especially prominent.
- limited/faulty letter-sound correspondences

Word recognition skills were slow to develop, especially the basic essential words such as those on the Dolch and Oxford lists. Acquiring these phonetically irregular words required good visual sequential memory skills. Word reversals also appeared.

Word-attack skills, including phonic skills, such as sound recognition, sound analysis and sound blending presented problems-especially those of a sequential nature.

Many years later, the importance of phonological processing skills was to be established by many researchers. I contend that insufficient attention has been directed to the underlying precursors of these processes-auditory sequencing skills.

Spelling

Problems present in reading were predictably noticed in spelling. Handwriting problems also caused difficulties. Typically, spelling and written expression difficulties persist throughout the school years.

Hence, in both reading and spelling, issues with orientation and sequencing were common.

Mathematics

Some students found the acquisition and development of a range of early maths skills very difficult including the following-

- formation of numerals-reversals were common
- counting-forwards and backwards
- basic algorithms-the sequence, or order of steps caused huge problems
- learning and recalling multiplication "tables"
- understanding common fractions
- telling the time-reading an analogue clock

Clearly, both orientation and sequencing are also fundamental concepts and abilities in maths learning.

A comprehensive coverage of directionality and associated issues is also provided in Section 2- Early Learning Essentials 1: Directionality on my website.

Secondly, my experiences as a psychologist confirmed the above observations. In addition, several other opportunities to witness some student's problems processing both orientation and sequence were gained. On the earlier editions of the WISC, the WISC-111 and the WISC-1V, two subtests provided useful insights into a student's information processing skills and learning.

The Information subtest (General Knowledge) required the student to answer the following questions-

How many days are there in a week?

How many months are there in a year?

What month comes after March?

The Information subtest of the WPPSI-R also had similar questions-

What day follows Saturday?

How many days are there in a week?

How many seasons are there in a year?

In which direction does the sun set?

These questions caused unexpected difficulties for many students.

The Block Design subtest- a test requiring the student to construct a model of a pictorial design using 2-colour blocks. Directional confusion (processing the blocks with red/white sides) was apparent in many students.

Additional challenges for such students were revealed in general discussion.

Questions such as the following-

- what is your birth date?
- what is your address?
- what is your home phone number?

often were not known.

Thirdly, these observations motivated me to undertake a Ph.D on the subject **The Perceptual Bases of Specific Reading Disability** (1974-1976).

This enabled me to explore the concept of directionality and its two dimensions- orientation and sequencing, empirically.

Directionality, has been shown by many past researchers in the fields of both Learning Disability and Reading Disability to be a relevant concept. (Orton, 1925; Geschwind,1962; Money,1962; Critchley, 1964; Rutter and Yule, 1973). Hence, I used a model of information processing established by Osgood (1957) and refined by Kirk et.al. (1961) in their work on the Illinois Test of Psycholinguistic Abilities (ITPA). This model provided a rationale for the selection of relevant published tests and also for the specific development of appropriate tests.

It is interesting to note the popularity, many years later of the CHC Model, (Cattell, Horn, Carroll) which is now frequently used to classify abilities and interpret results gained on such tests as the WISC-V, Woodcock-Johnson 1V and the WIAT-111.

A comprehensive discussion of my Ph.D, the tests used and findings are presented in the Section-Dyslexia.

The above experiences have given me direct, personal insight into the characteristics of a Learning Disability. These characteristics have been used as key dimensions in the several checklists in this Section.

In summary, I would argue that the precursor of a Learning Disability is an underdeveloped directional concept, with both orientational and sequencing skills implicated. This approach has obvious implications for educational interventions. As well as focussing on the "surface", educational problems in handwriting, reading, spelling, written expression and maths, it gives guidelines to identify, assess and treat any significant underdeveloped prerequisites of learning. To assist teachers, I have developed a set of tests/tasks in Sections 1 and 2 on this website that will firstly, improve their understanding of directional aspects of learning and secondly, identify any underdeveloped orientational and sequencing skills. The tests/ tasks will also provide teachers with examples of instructional activities that they can develop and use in the classroom.

A CONCEPTUAL FRAMEWORK OF DEVELOPMENT AND LEARNING

The acquisition and development of basic abilities, academic skills and appropriate behaviour are determined by internal and external factors. The following chart lists factors that can arrest, delay or enhance the development of basic abilities and lead to developmental and learning differences in students.

INTERNAL FACTORS	BASIC ABILITIES	ACADEMIC AREAS
Genetic	Sensory	The Arts
Physiological	Gross Motor	English
Neurological	Fine Motor	The Humanities
Biochemical	Visual Perception	Health and Physical Education
EXTERNAL FACTORS	Auditory Perception	Languages
Infection	Language	Mathematics
Physical trauma	Thinking	Science
Psychological	**LEARNING DIFFERENCES**	Technologies
Socio-cultural	Pace of Learning	
Educational	Styles of Learning	
BASIC CHARACTERISTICS	• Sensing/Intuitive • Visile/Audile • Analytic/Holistic • Reflective/Impulsive • Passive/Active • Individual/Group • Independent/Dependent	
Temperament		
Personality		
Behaviour		
Motivation		
Attentional Skills		

This conceptual framework includes the factors considered important in understanding development and learning.

The dimensions of internal and external factors refer to the major variables that contribute to human development. The internal or constitutional factors include fundamental developmental components that are neurological, physiological or

biochemical in nature. The external, environmental factors cover the experiential influences that shape development. For teachers, the critical variables over which they have some control relate to educational aspects which include teacher knowledge and skills, teaching style and quality of instruction and the nature of the curriculum.

The dimensions of basic abilities, learning styles and basic characteristics refer to the attributes and competencies that result from the combined contribution and interaction of internal and external influences.

The final dimension relates to the main academic areas and details the key learning or curriculum areas. An individual's ability to master one or more of the key learning areas depends on the integrity of the internal factors and facilitating external factors and the resultant development of appropriate attributes and competencies.

From an educational perspective, the key aspects of the conceptual framework over which teachers have some influence include the following-

External Factors	**Basic Abilities**	**Academic Areas**
Educational	Learning Essentials	Knowledge of Curriculum
Learning Styles		
	Teaching Styles	

The important variables highlighted refer to the teacher, the student and the curriculum. Specifically, issues include the quality of the educational environment, teaching competence and style, a student's attributes and competencies and the appropriateness of the curriculum.

STUDENTS WITH LEARNING PROBLEMS

In every classroom, some students will experience learning problems. The cause(s) of these problems will vary, however; several major categories of students with special needs have been recognised for funding and educational purposes.

The Victorian Department of Education and Training (DET) currently identifies the following seven categories of students in its Program for Students with Disabilities (2019):

Problem	Estimated Expectancy Rate (%)
Physical Disability	**0.5**
Visual Impairment	**0.1**
Severe Behaviour Disorder	**3**
Hearing Impairment	**0.5**
Intellectual Disability	**2.3**
Autism Spectrum Disorder	**1-2**
Severe Language Disorder With Critical Educational Needs	**0.2**
In addition, the DET has implemented a Language Disorder Program which supports schools in providing resources and services to the following group of students -	
Language Disorder	**5**

These categories represent only a relatively small percentage of students with special needs - those deemed to have severe disabilities and who may attend special schools. They do not include other important groups of students with problems in learning. These additional two categories include the much larger percentage of students who attend regular schools and can be classified as having either-

- **a Learning Difficulty, or**
- **a Learning Disability**

The problems experienced by many of the students in these last two groups are obvious and frustrating to themselves, their parents and their teachers. In some of these students, however, the problems are more subtle, being partially obscured by other

strengths, or frequently attributed to laziness, lack of attention or concentration or low motivation.

This classification identifies three groups of students with learning problems.

Group 1. Students with Severe Disabilities/Disorders

This group comprises those students with severe, low incidence disabilities that are identified as requiring special education in either a segregated or integrated educational setting. Typically, the definition and identification of these students have wide acceptance. In Victoria, seven categories of students are identified and represent those students eligible for inclusion in the Victorian DET's Program for Students with Disabilities and one group is included in their Language Disorder Program.

Considerable controversy surrounds the next two groups of students with learning problems-those with learning difficulties and those with learning disabilities. Consistency in terminology, definitions and characteristics has not been universally adopted and controversy abounds. For the purposes of this material, the terms will be defined as follows:

Group 2. Students with Learning Difficulties

Learning Difficulties is a generic term which refers to approximately 15-20% of students who exhibit problems in learning that are not as severe as those experienced by the students in Group 1. These students attend regular schools and are usually not eligible for special school enrolment or integration resources. The learning difficulties result from one or more of the following factors; below average general ability, physical and sensory defects, attentional and motivational problems, emotional difficulties, inadequate environmental experiences, lack of appropriate educational opportunities.

For these students, the cause of their learning difficulties is usually known and their problems in learning are not unexpected. These students generally demonstrate low achievement in most academic areas.

Group 3. Students with Learning Disabilities

This term refers specifically to the much smaller proportion (3-5%) of students who experience significant and unexpected learning problems despite at least average intellectual ability, unimpaired vision and hearing and no evidence of major primary emotional or behavioural problems. While the cause of the learning problems is unknown, it is presumed to have a neurological basis with strong evidence of a genetic origin. There is an uneven gender incidence with males outnumbering females by about 5 to 1. The learning problems are often associated with severe and prolonged difficulties processing sequential and orientational / positional information.

During the early primary school years, developmental delays in the processing of directional information including sequential and orientational / positional information are prominent. However, such problems gradually diminish in intensity with age and experience and the most obvious "tell-tale" feature is continuing academic underachievement, which can range from mild to severe.

Learning disabled students usually demonstrate uneven academic progress which is characterised more by underachievement than low achievement. Problems are usually

experienced in one or more of the following areas of literacy and numeracy learning including handwriting, reading, spelling, written expression and some areas of maths.

These students also attend regular school and, while not eligible for integration resources under the DET's Program for Students with Disabilities or the Language Disorder Program, may be considered eligible for Special Examination Arrangements in their VCE examinations.

A broad range of factors can contribute to academic learning problems. One factor common to many students with learning difficulties and a defining problem for students with a learning disability is persistent directional confusion which can result in uncertainty regarding:

- orientation-physical or positional location in space
- sequencing-successive arrangement of motor, visual or auditory information

Such uncertainty can be demonstrated in-

- slowly developing lateral awareness
- uncertain lateral awareness
- directional learning difficulties
- serial learning problems
- difficulties with short-term retention of sequential information
- slow rate of processing sequences of information (motor, visual and auditory)
- underdeveloped sense of time and order
- organisation and planning difficulties (spatial and temporal)
- time management problems

Students experiencing such directional confusion can present a real challenge to the classroom teacher, especially in the areas of literacy and numeracy instruction.

SOME KEY ISSUES

- Distinguishing between students with a Learning Difficulty and students with a Learning Disability
- Learning Disability and the concept of directionality

SOME KEY DEFINITIONS INCLUDING UPDATES FROM THE DSM-5

Key Definitions

The following definitions draw heavily on the contributions of previous researchers and organisations including Kirk (1963), NACEHC (1968), Hammill, et al., (1981) and Sykes (1982). The definitions were modified and finally adopted by the National Health and Medical Research Council of Australia (1990).

LEARNING DIFFICULTIES is a generic term which refers to the substantial proportion of children and adolescents who exhibit problems in developmental and academic skills. These difficulties are considered to result from one or more of the following factors; intellectual disability, physical and sensory defects, emotional difficulties, inadequate environmental experiences, lack of appropriate educational opportunities.

LEARNING DISABILITIES refers to the much smaller proportion (3 to 5%) of children and adolescents who exhibit problems in developmental and academic skills which are significantly below expectation for their age, grade and general ability. The disabilities, which often include severe and prolonged directional confusion, sequencing and short-term retention difficulties and phonological processing problems are presumed to be intrinsic to the individual, but they are not considered to be the direct result of intellectual disability, physical or sensory defects or emotional experiences or lack of appropriate educational experiences.

The DSM-1V (1995) and the DSM-1V-TR (2005) preferred the term Learning Disorders and offered the following operational definition-

LEARNING DISORDERS

"Learning disorders are diagnosed when the individual's achievement on individually administered, standardized tests in reading, mathematics, or written expression is substantially below that expected for age, schooling, and level of intelligence. The learning problems significantly interfere with academic achievement or activities of daily living that require reading, mathematical, or writing skills. A variety of statistical approaches can be used to establish that a discrepancy is significant. *Substantially below* is usually defined as a discrepancy of more than 2 standard deviations between achievement and IQ. A smaller discrepancy between achievement and IQ (i.e., between 1 and 2 standard deviations) is sometimes used…." (1995, p. 46).

The Victorian Curriculum and Assessment Authority (VCAA) defined a Learning Disability as follows-

"A student must have an average or above average IQ and have developmental and academic skills which are significantly below expectation for their present grade level. The disabilities are presumed to be intrinsic to the individual and long term, but not considered to be the direct result of intellectual disability, physical disability, sensory impairments or emotional difficulties nor derived directly from inadequate environmental experiences, or lack of appropriate educational experiences".

(Special Provision Handbook, 2014, p.128).

DSM-5 and SPECIFIC LEARNING DISORDER

As an introduction to the Diagnostic Criteria specified in the DSM-5, notes provided on Diagnostic Features are summarised below.

Specific learning disorder consolidates three DSM-1V learning disorders but includes specifiers related to deficits in reading, written expression and mathematics.

Specific learning disorder is a neurodevelopmental disorder with a biological origin that is the basis for abnormalities at a cognitive level that are associated with the behavioural signs of the disorder. The biological origin includes an interaction of genetic, epigenetic, and environmental factors which affect the brain's ability to perceive or process verbal or nonverbal information efficiently and accurately.

One essential feature of specific learning disorder is persistent difficulties learning keystone academic skills, with the onset during the years of formal schooling. Key academic skills include reading of single words accurately and fluently, reading comprehension, written expression and spelling, arithmetic calculation and mathematical reasoning.

Difficulties learning to map letters with the sounds of one's language-to read printed words-(often called dyslexia)-is one of the most common manifestations of specific learning disorder.

A second key feature is that the individual's performance of the affected academic skills is well below average for age. Academic skills are distributed along a continuum, so there is no natural cutpoint that can be used to differentiate individuals with and without specific learning disorder. Thus, any threshold used to specify what constitutes significantly low academic achievement (e.g., academic skills well below age expectations) is to a large extent arbitrary. Low achievement scores on one or more standardised tests or subtests within an academic domain (i.e., at least 1.5 standard deviations [SD] below the population mean for age, which translates to a standard score of 78 or less, which is below the 7th percentile) are needed for the greatest diagnostic certainty.

SOME COMMENTS: A specific example in the Australian context may be helpful.

To qualify as having a Specific Learning Disorder in reading, "the well below average" or the "low achievement score" would require a Year 12 student, (assumed to be 17 years old), to have a Reading Age of approximately 13.0 years or lower or a performance level below a Year 8 standard. Interestingly, a much less stringent cutpoint is frequently used in Australia to identify students with a Specific Learning Disorder.

Another issue is the tendency for an early diagnosis of say, dyslexia, to persist through school, even though more recent assessment and school reports show that the individual currently fails to meet the diagnostic criteria.

Another key diagnostic feature in the DSM-5 is that the learning difficulties are considered "specific"' for four reasons.

First, they are not attributable to intellectual disabilities, global developmental delay, hearing or vision disorders or neurological or motor disorders. Specific learning disorders affects learning in individuals who otherwise demonstrate normal levels of intellectual functioning (generally estimated by an IQ score of greater than about 70 with allowance

for error measurement). The phrase "unexpected academic underachievement" is often cited as the defining characteristic of specific learning disorder in that the specific learning disabilities are not part of a more general learning difficulty as manifested in intellectual disability or global developmental delay. Specific learning disorder may also occur in individuals identified as intellectually "gifted".

Second, the learning difficulty cannot be attributed to more general external factors, such as economic or environmental disadvantage, chronic absenteeism, or lack of education.

Third, the learning difficulty cannot be attributable to a neurological (e.g., paediatric stroke) or motor impairment or to vision or hearing disorders, which are often with problems learning academic skills but are distinguishable by presence of neurological signs.

Finally, the learning difficulty may be restricted to one academic skill or domain (e.g., reading single words, retrieving or calculating number facts).

COMMENTS: **Relevance to the Australian Scene**

In the past, an average or above IQ was a key requirement. Clearly, this is now not the case with students, performing well below average (but not lower than an IQ of 70), being eligible for consideration. There has been a gradual movement away from using intellectual ability as a defining criterion of Specific Learning Disability in the U.S.A. In Australia, the situation varies with some States not requiring information on intellectual functioning, while others still require a performance standard of an IQ 70 or above on an individualised, standardised test of intelligence (e.g., Victoria). Currently, within Australia, the States define Specific Learning Disability differently and do not find the DSM diagnostic criteria operationally useful. Education Departments in the various States are the main institutions involved in defining and identifying students with Specific Learning Disability. Although certain non-government organisations, such as SPELD, LDA and some University and Hospital Clinics, also diagnose learning disabilities.

If the DSM-5 diagnostic criteria were to be adopted, there would be a substantial increase in the number of individuals who would become eligible for school funding and special examination provisions in their senior school examinations. This would obviously have serious implications for funding and service provision.

I see the continuing mention of vision and hearing disorders as exclusionary factors to be most significant. Many children, especially boys, suffer from early bouts of middle-ear infection and associated intermittent hearing loss. That such children often experience substantial difficulties acquiring phonological skills and hence have problems learning to reading and spell, is not unexpected. As the primary cause of their learning deficits is highly likely to be auditory processing problems, it is incorrect, (as is the case with many professionals), to state that these children have a Specific Learning Disorder. While a Specific Learning Disorder can obviously co-exist with a hearing disorder, it is more appropriate in this case to consider the hearing disorder to be the primary causal factor, hence, it should be classified as a sensory disorder not a neurodevelopmental disorder.

In more recent years, auditory processing problems, especially those related to the acquisition and development of phonological skills, have been shown to play a critical

role in reading disabilities. See the extensive coverage of this topic in the following Sections-

- **Reading**
- **Learning Disability**
- **Dyslexia**

Some authors claim that phonological problems are, in fact, the key tell-tale sign of dyslexia. The DSM-5 specifically mentions "problems sounding out words" in Diagnostic Criteria 1 and further adds that "dyslexia" is an alternative term for a pattern of learning difficulties characterized by several problems including "poor decoding".

The DSM-5 stressed that a comprehensive assessment is required. Specific learning disorder can only be diagnosed after formal education starts but can be diagnosed at any point afterward in children, adolescents or adults, provided there is evidence of onset during the years of formal schooling (i.e., the developmental period). No single data source is sufficient for a diagnosis of specific learning disorder. Rather, specific learning disorder is a clinical diagnosis based on a synthesis of the individual's medical, developmental, educational and family history; the history of the learning difficulty, including its previous and current manifestations; the impact of the difficulty on educational, occupational or social functioning; previous or current school reports; portfolios of work requiring academic skills; curriculum based assessments and previous or current scores from individual standardised tests of academic achievement.

DIAGNOSTIC CRITERIA

A. Difficulties learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties:
    1. Inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guessing words, has difficulty sounding out words).
    2. Difficulty understanding the meaning of what is read (e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read).
    3. Difficulties with spelling (e.g., may add, omit, or substitute vowels or consonants).
    4. Difficulties with written expression (e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity).
    5. Difficulty mastering number sense, number facts, or calculation (e.g., has poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact as peers do; gets lost in the midst of arithmetic computation and may switch procedures).
    6. Difficulties with mathematical reasoning (e.g., has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems).

B. The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, and cause significant interference with academic or occupational performance, or with activities of daily living, as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment. For individuals age 17 years and older, a documented history of impairing learning difficulties may be substituted for the standardized assessment.
C. The learning difficulties begin during the school-age years but may not become fully manifest until the demands for those affected academic skills exceed the individual's limited capacities (e.g., as in timed tests, reading or writing lengthy complex reports for a tight deadline, excessively heavy academic loads).
D. The learning difficulties are not better accounted for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction.

Note: The four diagnostic criteria are to be met based on a clinical synthesis of the individual's history (developmental, medical, educational) school reports, and psycho-educational assessment.

Coding note: Specify all academic domains and sub-skills that are impaired. When more than one domain is impaired, each one should be coded individually according to the following specifiers.

NOTE: only one example is provided.

Specify if:

315.00 (F81.0) With impairment in reading:

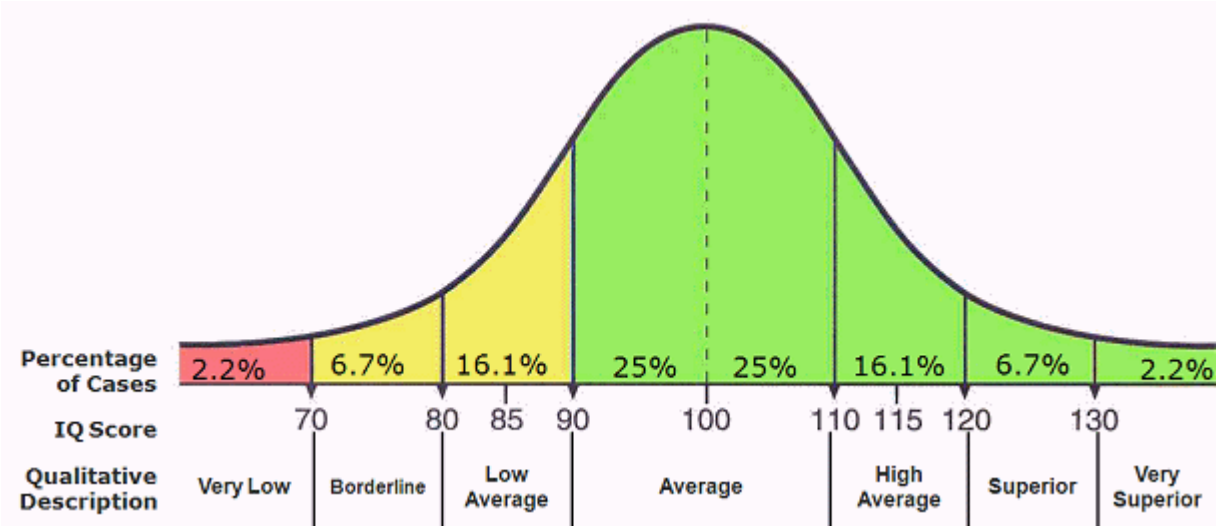
- Word reading accuracy
- Reading rate or fluency
- Reading comprehension

Note: Dyslexia is an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities. If dyslexia is used to specify this particular pattern of difficulties, it is important to specify any additional difficulties that are present, such as difficulties with reading comprehension or math reasoning.

Specify current severity.

Mild, Moderate, Severe.

The Normal Curve shown below provides a diagrammatic representation of IQ levels, percentile rankings and standard deviation levels. The area in green represents average IQ and above - a defining characteristic of some definitions of a learning disability. With the adoption in Victoria of the DSM-5 definition, the area now needs to be expanded and includes the yellow areas showing an IQ of 70 and above.



In 2015, the VCAA changed the term Learning Disability and their definition to comply with the DSM-5 changes to Specific Learning Disorder.

I have retained the original term and definition to highlight the important changes. The VCAA adopted the following definition of Specific Learning Disorder-

"Specific learning disorder is a neurodevelopmental disorder with a biological origin. It is manifested in persistent difficulties with learning and using academic skills including handwriting, reading (word recognition and/or comprehension), spelling, written expression and mathematics. The affected area(s) are significantly below current grade expectations. A specific learning disorder is not attributable to intellectual disabilities, hearing or vision disorders, motor impairment, emotional disturbance or external factors such as environmental disadvantage, chronic absenteeism or lack of appropriate educational experience. Dyslexia is the most common type of specific learning disorder."

(VCAA, 2016 Special Examination Arrangements Application Form. p.9.)

A minor change was made to the VCAA 2016 definition as the DSM-5 definition of Specific Learning Disorder omitted handwriting difficulties and included them in a separate neurodevelopmental disorder- **Motor Coordination Disorder**. This separated category includes students with fine motor problems including handwriting difficulties. The term Dysgraphia is not used in DSM-5.

Hence, the VCAA 2017 definition of Specific Learning Disorder was as follows-

"Specific learning disorder is a neurodevelopmental disorder with a biological origin. It is manifested in persistent difficulties with learning and using academic skills including reading (word recognition and/or comprehension), spelling, written expression and mathematics. The affected area(s) are significantly below current grade expectations. A specific learning disorder is not attributable to intellectual disabilities, hearing or vision disorders, motor impairment, emotional disturbance or external factors such as environmental disadvantage, chronic absenteeism or lack of appropriate educational experience. Dyslexia is the most common type of specific learning disorder."

(VCAA, 2017 Special Examination Arrangements Application Form. p.9).

VCAA and Major Handwriting Difficulties

Requests for Special Examination Arrangements for students experiencing major handwriting difficulties (which arise from long term developmental, fine-motor coordination problems and not from severe health impairment or significant physical disability or injury) should apply under the requirements stipulated on page 9 (Specific Learning Disorder).

(VCAA, 2017 Special Examination Arrangements Application Form. p.6).

DSM-5 -Motor Coordination Disorder

The DSM-5 has a separated category-Motor Coordination Disorder- which is included in the group of Neurodevelopmental Disorders. Also included in this group are Intellectual Disability, Specific Learning Disability, Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder.

Motor Coordination Disorder includes students with fine motor problems including handwriting difficulties. Interestingly, the term Dysgraphia is not used in the DSM-5.

Following a review of Special Examination Provisions, the VCAA adopted the following definition of Specific Learning Disorder-

"Specific Learning Disorder is a neurodevelopmental disorder with a biological origin. Students with this disorder possess specific cognitive deficits that cause difficulties with learning and us of academic skills and manifest in persistent problems with one or more of the following-

- inaccurate or slow and effortful word reading
- understanding the meaning of what is read
- spelling
- written expression
- mastering number sense, number facts or calculations
- mathematical reasoning.

The affected academic skills are substantially and quantifiably below those expected for the student's grade and/or cause significant interference with academic performance. The learning difficulties are not better accounted for by intellectual disabilities, hearing and vision disorders, motor impairment, mental health disorders or external factors such as environmental disadvantage, chronic absenteeism or lack of appropriate educational experience.

The diagnosis of a learning disorder must be based on the integration of comprehensive clinical evidence from a range of sources including a student's history (developmental, medical, family and educational) and appropriate assessment results."

(VCAA 2018 Special Examination Arrangements Application Form. p.10.)

SPECIFIC LEARNING DISORDERS: USES AND ABUSES OF KEY TERMS

The Misuse of the Word Dyslexia

DSM-5

The DSM-5 Neurodevelopmental Work Group, concluded that because of the many definitions of **Dyslexia** and **Dyscalculia** these terms would not be useful as disorder names or in the diagnostic criteria. Despite this advice, many psychologists and other professionals falsely use these terms, especially Dyslexia, as a disorder name. For instance, some label the reading disorder in the following way-DSM-5-Specific Learning Disorder (Dyslexia). This is an incorrect classification. Two types of reading problems are referred to in the DSM-5:

1. Inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guessing words, has difficulty sounding out words).

2. Difficulty understanding the meaning of what is read (e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read).

Note that there is no mention of the term Dyslexia in the above symptoms.

In a special note, however, Dyslexia is mentioned and seen as an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding and poor spelling abilities.

Hence, Dyslexia is viewed as a term to cover aspects of early basic reading skills (word recognition and decoding skills) and spelling. The term encompasses two symptoms of SLD-poor word reading and inaccurate spelling.

If Dyslexia is used to specify this particular pattern of difficulties, it is considered important to specify any additional difficulties that are present, such as difficulties with reading comprehension or maths reasoning.

This point raises several important and potentially confusing issues relevant to reading problems. While co-existing difficulties associated with Dyslexia (basic reading problems) need to be identified, any attendant competencies or strengths in literacy learning, such as reading vocabulary knowledge and/or reading comprehension should be acknowledged.

Understandably, parents, teachers and psychologists, not familiar with reading disabilities, are surprised to learn that many students who have problems with the acquisition of basic reading skills, including phonological skills, phonic skills and word recognition skills (the common signs of Dyslexia, as mentioned above) can achieve competence in reading vocabulary and reading comprehension. To appreciate this seemingly counterintuitive/contradictory assertion, some points need to be made.

Firstly, an understanding of the developmental continuum of reading is necessary. Early reading skills are dependant upon basic auditory and visual skills and fundamental language skills. These include the following-

auditory processes

phonological skills

phonic skills

visual processes

orthographic skills

word recognition skills

language processes

oral language skills-receptive and expressive

word meaning

These processes can be defined as being lower-order abilities. They involve the basic perceptual, memory, language and cognitive skills used to identify words. The primary focus is on word recognition.

Advanced reading skills, while dependent on basic word recognition skills, become more reliant on higher-order skills, such as understanding, thinking and reasoning. The primary focus is on comprehension.

Viewed in this way, as the student progresses through school, reading becomes more a thinking skill rather than a perceptual, recognition skill.

Secondly, this helps explain why many students, even those having severe early reading problems, and in some cases, continuing difficulty with basic word recognition skills (especially phonological skills) can achieve a satisfactory standard of reading comprehension in later years in secondary school. This can occur because different skills are involved.

Evidence for such a situation is gained through the following sources-

- by informal (classroom observations) and formal assessment (testing) of reading comprehension,
- by examining applications for special examination arrangements for VCE (extra reading time, reader), which often includes an assessment of both basic reading skills and advanced reading skills. While many students continue to have poor lower-order basic reading skills (e.g., phonological awareness), very few are found to have significantly underdeveloped higher-order reading skills (e.g., comprehension).

Note-It is not uncommon for psychologists, who find underdeveloped phonological skills in students, to label the student dyslexic, even when the student has been found to possess average or better reading comprehension skills. As the purpose of reading is to gain meaning from print, students who achieve this goal should not be labelled dyslexic in the generic sense. Unless, of, course, there is a clear explanation of the specificity of the term (i.e., as defined in DSM-5)

Furthermore, it should not be surprising that students, even those with a slow or difficult start to reading, should improve their reading throughout secondary school. The "natural" process of reading texts and instructional material, etc, an essential aspect of secondary school learning, helps to improve reading in most students who have experience early reading problems.

The ICD-10-WHO (2015)

Five categories of Specific Developmental Disorders of Scholastic Skills (SDDSS) are mentioned, one of which is called-

Specific Reading Disorder.

SRD is seen as a specific and significant impairment in the development of reading skills including, word recognition, oral reading skills, reading comprehension and performance on tasks requiring reading, may all be affected. Spelling difficulties are frequently associated with SRD and often remain into adolescence even after some progress in reading has been made.

Again, there is no direct mention of the word Dyslexia as a diagnostic category or disorder name. However, the term SRD is reported to include the following conditions-

- backward reading
- developmental dyslexia
- specific reading retardation

Professional Associations and Usage of Terms

It is common for Organisations interested in Learning Disabilities to use the term Dyslexia. Such is the case in the U.K., U.S.A. and Australia. In fact, in the UK, one relevant organisation is called the British Dyslexia Association. While the BDA is interested in all types of reading and spelling problems, they define Dyslexia as

..." a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling".

They consider that the condition is characterised by difficulties with phonological processing, rapid naming, working memory and processing speed.

While the BDA considers that Dyslexia refers to a narrow set of reading skills, they, like many organisations, use the term as a synonym, not only for all reading problems, but for all Specific Learning Disorders.

Likewise, the International Dyslexia Association (IDA) in the USA, defines Dyslexia broadly as a language based learning disability.

Dyslexia refers to a cluster of symptoms which result in people having difficulty with specific language skills including reading and difficulty with other language skills including spelling, writing and pronouncing words.

Interestingly, many clinics, centres and professionals specialising in Specific Learning Disorder use the term Dyslexia in their promotional literature/brochures as a cover-all term for any type of reading problem and often for any type of learning disability. The word has been so misused overtime that it is readily used as a synonym for Specific Learning Disorders.

The misuse of the word Dysgraphia

The misuse of Dysgraphia needs to be discussed in this Section on Specific Learning Disorder for two reasons-

- Dysgraphia is not a Specific Learning Disorder
- Dysgraphia is not poor or slow handwriting-it is illegible handwriting

Many psychologists and Occupational Therapists continue to incorrectly use the term Dysgraphia. Dysgraphia, in the strict clinical sense, refers to illegible handwriting caused by a severe motor coordination problem. The fine-motor problem is presumed to have a neurological aetiology.

Too frequently, professionals use the term Dysgraphia to describe poor or slow handwriting. They also continue to refer to Dysgraphia as a Specific Learning Disorder.

A Clarification

The two major international classificatory systems of disorders, the DSM-5 and the ICD-10, **DO NOT** include handwriting problems or Dysgraphia in their academic or scholastic disorders.

DSM-5

The DSM-5 under the heading of Specific Learning Disorder (SLD), lists symptoms/difficulties in reading, spelling, written expression and mathematics.

Symptom 4 states-

"Difficulties with written expression (e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity)". (p.66).

The emphasis is clearly on written expression, not handwriting.

In addition, the DSM-5 states that the learning difficulties "are not attributable to intellectual disabilities, global development delay, hearing or vision disorders or neurological or motor disorder." (p.69).

Hence, as Dysgraphia is presumed to be caused by a motor disorder and have a neurological base, it clearly does not meet the above requirement for a SLD.

The DSM-5 has a separated category that includes students with fine motor problems including handwriting difficulties. The category, **Motor Coordination Disorder**, is included in the group of Neurodevelopmental Disorders which also includes Intellectual Disability, Specific Learning Disorders, Communication Disorders, ADHD and ASD. The term Dysgraphia is not used in DSM-5.

ICD-10 (WHO)-2015

The ICD-10- International Statistical Classification of Diseases and Related Health Problems, Chapter V-Mental and Behavioural Disorders includes Specific Developmental Disorders of Scholastic Skills (SDDSS). These include the following-

- Specific Reading Disorder
- Specific Spelling Disorder
- Specific Disorder of Arithmetical Skills
- Mixed Disorder of Scholastic Skills

Other Developmental Disorders of Scholastic skills, unspecified

There is no mention of handwriting problems or **DYSGRAPHIA.**

However, there is reference to motor problems in the following separate category-

- Specific Developmental Disorders of Motor Function

The problems relate to both fine-motor and gross motor coordination. Several examples are mentioned including- slow to learn to run and hop, difficulties learning to tie shoelaces, to fasten and unfasten buttons, to throw and catch a ball and to have **poor handwriting.**

Professional Associations and Usage of Terms

Unfortunately, professional associations both in the UK (British Dyslexia Association) and in the USA (International Dyslexia Association-IDA) include Dysgraphia in their category of LD/SLD.

The IDA has adopted the definition of Dysgraphia used by the National Joint Committee on Learning Disability-(NJCLD)-

"Dysgraphia is a learning disorder that affects writing ability. Can manifest itself as difficulties with spelling, poor handwriting and trouble putting thoughts on paper".

Such a broad definition clearly goes well beyond the original, clinical understanding of Dysgraphia. It would seem as though professionals are choosing to use the broad definition provided by these organisations rather than adhering to the correct usage, as clearly presented in the DSM-5 and ICD-10.

Occupational Therapists (OTs) frequently use the term Dysgraphia, often basing their findings on slow handwriting speed. Dysgraphia is not slow or poor handwriting it is **ILLEGIBLE** handwriting. I am in the position to assess the eligibility of students for special examination arrangements under the rubric SLD. Many students diagnosed by OTs as having an SLD-Dysgraphia, (now incorrectly, of course), are found to have no functional evidence of problems with handwriting legibility or speed. So often the assessors rank the handwriting as being readily readable, and productivity as being of an average or above standard. Both dimensions are so easily assessable in the submitted essays.

Interestingly, some OTs are now using the appropriate DSM-5 term, Motor Coordination Disorder, to describe handwriting problems.

An unfortunate consequence of misusing words such as Dyslexia and Dysgraphia, is the misleading information professionals give to teachers and parents. The loose use of these words can obviously have a devastating impact on students who, once incorrectly labelled as having Dyslexia or Dysgraphia, continue to believe that they have a severe learning disability throughout their schooling and into adulthood. Clearly, this can impact on their self-esteem as a learner and also lead to a self-fulfilling prophecy of incompetence.

Misuse of the term Dyscalculia

The term Dyscalculia is not used as frequently as the other terms, Dyslexia and Dysgraphia. This is mainly due to the relatively limited focus of attention given to problems in mathematics in comparison to that given to difficulties with reading and handwriting.

The DSM-5 lists two types of problems with mathematics-

5. Difficulty mastering number sense, number facts, or calculation (e.g., has poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact as peers do; gets lost in the midst of arithmetic computation and may switch procedures).

6. Difficulties with mathematical reasoning (e.g., has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems)

As is the case with reading problems, which are listed as two clusters of symptoms- a more basic, fundamental set of conditions and a higher-order, thinking and reasoning set of conditions-such is the position with the treatment of mathematical problems.

<u>Note that there is no mention of the term Dyscalculia in the above symptoms.</u>

The DSM-5 states that Dyscalculia is an alternative term used to refer to a pattern of difficulties characterised by problems processing numerical information, learning arithmetic facts and performing accurate or fluent calculations. If Dyscalculia is used to specify this particular pattern of mathematical difficulties, it is important also to specify any additional difficulties that are present, such as difficulties with mathematical reasoning or word reading accuracy. (p.67).

The ICD-10 identifies problems in mathematics as such-

- Specific Disorder of Arithmetical Skills

SDAS involves a specific impairment in arithmetical skills that is not solely explicable on the basis of general mental retardation or inadequate schooling. The deficit concerns mastery of basic computational skills of addition, subtraction, multiplication, and division rather than of more abstract mathematical skills involved in algebra, trigonometry, geometry, or calculus.

The term includes-

- developmental acalculia
- arithmetical disorder
- Gerstmann syndrome

Interestingly, this definition is restricted to basic mathematical skills and does not include higher-order, more abstract skills.

As mentioned above, the term Dyscalculia, like the term Dyslexia, has been defined in so many different ways that it is not useful as a disorder name or in diagnostic criteria.

An unfortunate consequence of the multiple definitions of Dyslexia, Dysgraphia and Dyscalculia and the lack of any consensual agreement, is the common practise of professionals and organisations to use the most convenient term.

For instance, they report that Dyslexia **CAN** be defined as such and then they use their favoured definition, usually the definition that suits their purpose. For example, the chosen definition suits the purpose for funding or the student's inclusion in a special education program or consideration for special examinations arrangements.

MORE RECENT UPDATES ON SOME IMPORTANT ISSUES

Models of Identification of SLD

The re-authorized Individuals with Disabilities Education Improvement Act (IDEIA) (PL 108-446) was signed into law on December, 3, 2004 and subsequent regulations published in 2006, have significantly changed the identification process for students suspected of having SLD. Rather than using the established Discrepancy Model contrasting intellectual and achievement test results, assessment specialists now incorporate a selection of methods to identify specific learning disabilities, including response-to-intervention, (RTI) cognitive processing approaches and the determination of a pattern of strengths and weaknesses. (PSW).

Beginning more than 30 years ago, a growing chorus of researchers called for an alternative to the IQ discrepancy models as a means to identifying students with learning disabilities. (Siegel, 1988; Fletcher et al., 1998). Those researchers described the discrepancy model as both inaccurate (because of the over-identification of some students and the under-identification of others) and inefficient (because of its reliance on a "wait-to-fail" model).

Hence, the States could not mandate the use of the Discrepancy Model for identification of students with learning disabilities. Some Districts use different models including-

1. Discrepancy Model (Now the gap between Grade level expectations and current academic performance)

2. Response to instruction and intervention Model (RTI)

3. Patterns of Strengths and Weaknesses Model (PSW)

The RTI Model

This model arose because of a concern about the appropriateness of instruction. This is a very important exclusionary factor in definitions of SLD. Authorities need to show that a student was not experiencing learning problems because of inadequate, or poor instruction. Rather that they had received appropriate instruction that was evidence-based.

The responsiveness to scientific-based interventions (i.e., RTI) concept in IDEA is a greater specification of this basic concept of appropriate instruction.

The Individual with Disabilities Education Improvement Act (IDEA) 2004 sanctioned RTI base assessment as an optional method for identifying students with SLD. With this scheme, students who remain non-responsive through the final tier of RTI, may be identified as having a learning disability without a comprehensive evaluation that includes the measurement of cognitive abilities. As a result of the IDEA approval of the RTI assessment option, the longstanding method of establishing an intelligence-achievement discrepancy to identify SLD, would no longer be required.

RTI was included in the most recent authorization of the Individuals with Disabilities Education Implementation Act (IDEIA), 2008.

In States that allow (but do not require) this approach, Districts may opt to use other methods, including discrepancy. IDEIA also granted States independence in determining whether to require or allow their Districts to use RTI in identifying SLD.

The DSM-5 makes no mention of the RTI, as part of Criterion A, or the need to ensure that the instruction provided to SLD students is research-based. All that is required is a report from the teacher or parent confirming that some type of intervention/instruction for the manifest learning difficulty was tried but that the symptoms persist. (Tanner, 2016).

No systematic process was outlined in the earlier regulations for insuring that the learning experiences provided before referral of the students for evaluation were those that were found to be effective. That is, those that were found to be appropriate for the child's age and abilities levels.

The implementation of RTI has been rapid and extensive as evidenced by its use as a multi-tiered prevention in all 50 States. (Al Otaiba et al., 2014).

RTI is generally represented as a preventative assessment and instructional model consisting of multiple tiers whose purpose is the early identification of students, who because of deficits in basic skills relative to grade level expectations, are in danger of falling further behind without instructional modifications.

Three uses of the RTI components are commonly described-

1. prediction of at-risk students.

2. intervention for students with academic or behavioural difficulties, and

3. as a component of SLD determination.

Three tiers of instruction are outlined-

Tier 1- Implies General Instruction

Tier 2- Implies General and Special Education

Tier 3- Implies Special Education-a specific, intensive instructional program

Within the RTI model, a student may be identified with SLD but only after receiving effective instruction and intensive intervention.

The introduction of proof of intervention is a progressive move despite the obvious shortfalls in implementation. Earlier definitions which were exclusionary had assumed that the student with a learning disability, had received appropriate or adequate educational intervention. While a stated requirement under the IDEA, there is no guarantee of rigid compliance to the requirement of scientifically- based interventions.

Concerns about the Model include the following-

Delayed identification, that is, the time required to establish a discrepancy. Reynolds and Shaywitz (2009) referred to this as a "watch-them-fail" model and Al Otaiba et al., (2014) a "wait-to-fail" approach.

Despite its widespread support, little empirical research has been conducted on tangible outcomes of RTI. (Al Otaiba et al., 2014).

Because of the variability of models, determining the effectiveness of RTI continues to present challenges.

Hudson et al., (2016) conducted an extensive study of the policies and procedures used to evaluate the use of RTI to identify SLD. Administrators perceptions were investigated. Results suggested that respondents were unable to determine if their expectations of RTI are being fulfilled. This appears to be attributable to a recursive theme throughout the study-namely quality assurance.

"The goals of RTI are laudable, but the extant evidence for empirically supported evidence is weak, its implementation is problematic, its claim for prevention of SLD or early intervention of students with SLD is unsubstantiated, and inadequate teacher training poses a major barrier to its successful implementation." (Tanner, 2016, p.209).

In spite of the concerns and criticism about RTI, it continues to be used across the USA.

Districts of the USA have been allowed to use the PSW Method as one of the models for SLD eligibility since the IDEA was reauthorized in 2004.

The PSW Model

Although these are various versions of PSW Models, there are important shared features across these models. These features include-

- requiring both an academic and a cognitive processing deficit
- requiring some degree of cognitive functioning that is at, or above, average
- requiring research-based consistency between academic and cognitive processing deficits
- using a cross-battery assessment approach to evaluate all relevant core cognitive processing areas
- eliminating exclusionary factors

Advantages of PSW

There are many advantages to using PSW over other models to determine eligibility for a SLD. These advantages include-

- having a comprehensive assessment of a student's cognitive processing skills and academic abilities
- increasing efficiency in testing by eliminating unnecessary overtesting in some cognitive processing areas and undertesting in other areas
- having a firm theoretical and research-based framework when tying assessment results to classroom performance
- making instructional recommendations that are directly linked to the student's profile of strengths and weaknesses
- having the support of many State Associations of School Psychologists and being considered to be the most defensible model currently available for determining SLD eligibility

For students for whom a special education eligibility of SLD is being considered using the PSW Approach, the student must meet the following criteria-

1. The student exhibits a pattern of cognitive or processing strengths, indicated by a pattern of abilities in the average or above ranges.

- Processing areas examined may include verbal and non-verbal problem solving, short term and long term memory, processing speed as well as executive functions.

2. The student exhibits both significant cognitive and academic weakness(es)

- The school psychologist and possibly the speech/language pathologist determine if any processing weaknesses exist.
- The special education teacher examines whether any academic areas of deficit are present.

3. A research-based link exists between the cognitive and academic weakness(es)

- The assessment team should ensure that the profile makes sense. A weakness in phonological processing may explain reading difficulties but is not a sensible explanation for a maths problem-solving difficulty.

4. That the student requires special education to access the core curriculum.

- For all students in special education, it must be demonstrated that they require specially designed instruction in order to access the core curriculum.

There is not a universal acceptance of the PSW Model with concerns including the following-

- the complicated formulae used/recommended by some researchers in determining strengths and weaknesses and pattern analysis
- the lack of empirical evidence
- the basic cognitive tests that should be used to identify a student's strengths and weakness
- the ability of teachers to interpret reports from psychologists and other specialists

DSM CLASSIFICATION OF LD/SLD: DSM-111 to DSM-5

A study of the changing DSM classifications/diagnostic criteria for LD/SLD is informative and fundamentally mirrors the changing views of definitions and identification over the years.

DSM-111 (1980)

Disorders Usually first Evident in Infancy, Childhood or Adolescence.

Specific Developmental Disorders

Developmental Reading Disorder

Developmental Mathematics Disorder

Developmental Language Disorder

Developmental Articulation Disorder

Mixed Developmental Disorder

Atypical Specific Developmental Disorder

Developmental Reading Disorder

Diagnostic Criteria.

Performance on a standardised individually administered tests of reading skill is significantly below the expected level, given the individual's schooling, chronological age and mental age as delineated by an individually administered IQ test. In addition, in school, the child's performance on tasks requiring reading skills is significantly below his or her intellectual capacity. The difficulties were not attributable to certain intrinsic and extrinsic factors.

Hence, the diagnostic criteria had two key elements- discrepancy and exclusion.

DSM-1V (1994)

Disorders Usually First Diagnosed in Infancy, Childhood or Adolescence

Learning Disorders

Reading Disorder

Mathematics Disorder

Disorder of Written Expression

Learning Disorder NOS

Learning Disorders

Learning disorders are diagnosed when the individual's achievement on individually administered, standardised test in reading,.....is substantially below that expected for age, schooling and level of intelligence.

A variety of statistical approaches were mentioned to determine the substantial gap.

The difficulties were not attributable to certain known intrinsic and extrinsic factors.

Again, the diagnostic criteria had two key elements- discrepancy and exclusion.

DSM-5 (2013)

Specific Learning Disorders

Defines six types of specific learning disorders and identifies four diagnostic criteria.

As cognitive ability is no longer assessed, there is no need for an IQ assessment.

Underachievement is defined as a gap between grade expectations and current academic performance. Underachievement must be significantly below grade expectations.

Hence, there is now a different deficit or discrepancy model.

No reference is made to the Response-to-Instruction (RTI) model or the need for evidence- based instruction that was mentioned in the IDEA 2004.

Again, difficulties were not attributable to certain known intrinsic or extrinsic factors.

Hence, again the diagnostic criteria had two key elements- discrepancy and exclusion.

In a special note Dyslexia was mentioned as an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities.

(Full details of this definition and diagnostic criteria can be found in Section-Learning Disability- pp.16-17)

The DSM-5 criteria for SLD has been used by the Victorian Education Department's VCAA to determine eligibility for SEAs in VCE examinations.

The current position views SLD as a neurodevelopmental disorder with genetic influences that affects the ability to perform basic psychological processes. Interestingly, I have long contended that the underdeveloped cognitive process is the ability to process directional information both orientational and sequential. To explore the directional concept was a major rationale for my Doctoral studies in the mid 1970s. For more details on the model I proposed in explaining the educational, psychological and neurological bases of SLD/dyslexia, the reader should consult (pp.58-60) in this Section. For more extensive information about my Doctoral studies, the reader is directed to the Section-**Dyslexia**.

Interestingly, this position is quite similar in most ways to the opinions of pioneer scholars in the past- Thomas (1905), Hinshelwood (1917) (congenital word-blindness), Orton (1925), Money (1962), Critchley (1964), Eisenberg (1966), Thompson (1969), Satz and Sparrow (1970), Naidoo (1978), (developmental dyslexia) and Kirk and Bateman (1962), Myklebust and Johnson (1962) Rabinovitch (1962), learning disability/specific learning disability.

AN OPINION PIECE

Learning Disability/ Specific Learning Disorders- Definitions and Identification

Despite many attempts to improve operational definitions of SLD, perfect identification processes and discover superior instructional methods, there continues to be ongoing dissatisfaction among researchers, psychologists, teachers and other relevant professionals, about the progress made since Kirk first identified and defined learning disability in 1963.

Barriers to Progress

Definitions

The continuing notion that there is no defining "tell-tale" sign of a learning disability and that it is identified by exclusion and not inclusion is a constant concern.

Of course, the construct is a hypothetical, psychological concept that can never be absolutely confirmed.

The definition of LD/SLD has mostly remained constant since its conceptualization in the 1960s. This is especially the case in the USA which remains the centre of LD interest, research and legislation. The definition, originally devised by an academic, has been supported by the US Office of Education, major organisations such as the NJCLD and incorporated in Legislation such as the IDEA (2004).

Basically, the definition has two components-

- notion of discrepancy between measured cognitive abilities and academic performance
- exclusionary factors both intrinsic and extrinsic

The definition is exclusionary, not inclusionary. It does not identify unique or special markers of SLD. Hence, the definition is not really operational- a factor that has been a constant irritant to many psychologists and teachers.

Typically, definitions of SLD stress that known, identifiable, causal factors of learning problems should be eliminated before a student is correctly labelled as having a SLD. In reality, this is not an easy operational requirement to achieve.

While factors such as intellectual disability, neurological impairments, severe sensory impairments and major behavioural and emotional problems can be identified and hence students not labelled SLD, other factors are more subtle and not readily recognisable. Examples include social disadvantage/economic or environmental disadvantage, family

disturbances and especially developmental health issues, such as early bouts of Otitis-Media (middle-ear-infection) with intermittent hearing loss.

Students with these unknown/unreported problems can easily be incorrectly considered to have a learning disability when they are not really eligible for such classification. This can occur in research samples and in practical situations such as students being identified at school. It is obviously very difficult to ensure that the usual exclusionary factors are accounted for as it would take considerable time to check that all prospective students did not possess these "known" causal factors.

I became well aware of this concern while undertaking my Ph.D research on specific reading disability in 1977. A thorough review of the literature revealed that a significant number of the "classical" studies in the field made no reference to stringent student selection. My past and current reading of the methodology section-especially sample selection- of research papers on SLD, continues to cause me great concern about student eligibility for such classification.

As a psychologist, I have had over 30 years experience determining the eligibility of students to qualify for special education funding and special examination arrangements under the rubric SLD. I am well aware that it is impractical to ensure that all exclusionary factors are considered. Such an activity would require reports from a wide range of professionals and also details of family life, social status, cultural issues etc. With the basic requirement of a psychology report, many families state that they are unable to afford the expense.

Compared to other neurodevelopmental disorders (see DSM-5), the SLD diagnostic criteria contain ambiguous components and some lack precision. For instance, the diagnostic criteria for intellectual disability are straight forward- it requires measures of cognitive functioning and social competence. The diagnostic criteria for ASD are also fundamentally straight-forward. Like Intellectual Disability, it is an inclusionary definition, not an exclusionary definition The listed typical characteristics are readily observable.

Interestingly, while the DSM-5 diagnostic criteria for ASD are basically clear-cut, this does not mean that there is universal agreement in the field about what criteria should be used in a particular country, state or jurisdiction. Obviously, many countries do not adhere to DSM guidelines.

The critical factor of diagnostic uncertainty is a key reason for the continuing confusion and disagreement in the field of SLD.

Perhaps my biggest concern about the identification of students with SLD comes from many years experience as a Director of a University Clinic and in private practice. In these situations, I was able to interview parents and ask questions about their child's early developmental history. It quickly became apparent that many children, especially boys, had experienced early bouts of Otitis-Media with attendant intermittent hearing loss. Obviously, such children should not be labelled SLD as the primary reason for any learning difficulty would be their early hearing/auditory problems. It is well known that underdeveloped phonological skills contribute to literacy learning problems, especially reading and spelling, and it is now considered by many to be the established cause of dyslexia.

With the treatment of early bouts of middle-ear-infection, the child is unlikely to display hearing problems when they commence school. However, the consequences of this illness can arrest the natural development of phonological processing skills, and hence, negatively impact on the acquisition and development of reading and spelling. Unless the medical history of children is checked, the school is unlikely to know about this infection

and hence the child would be incorrectly labelled as having SLD, if they experience learning difficulties. The situation is obviously the same in research where such medical records are unlikely to have been checked to ensure that the sample cohort meets the definitional requirements of SLD. I suspect that a high proportion of students are falsely labelled SLD because certain "known causal factors" are not taken into consideration.

I was well aware of this frustration as early as the 1960s and hence developed checklists for practitioners that identify common characteristics of LD. As mentioned elsewhere on this website, these characteristics are those that I have observed over more than 30 years of experience as a special education teacher and psychologist, specialising in the field of LD. This website includes many of these checklists that were a feature of my time as a Director of the Krongold Centre at Monash University.

Changing Models of Identification or Diagnostic Criteria

While definitions have been basically similar over time, methods of identification have varied. The diagnostic procedures have always been controversial.

There was a growing disquiet among scholars and researchers about the role of IQ assessment. With the DSM-5, the deficit/discrepancy model continues to be used, BUT the discrepancy is now between grade expectations and current academic abilities. Hence, there is no longer a need to measure cognitive abilities-the critical requirement is to assess current educational abilities.

What constitutes a substantial discrepancy between grade expectations and academic performance remains contentious. There continues to be no consensual agreement about this important issue. The DSM-5 tackles this issue and recommends a deficit of 1.5 to 2.0 standard deviations below average.

Some of these concerns were addressed with the passing of the Federal reauthorized Individuals with Disabilities Education Improvement Act (IDEA) in 2004.

Since IDEA, many State Education Agencies have opted to allow the use of alternative research based procedures in the context of a Response- to- Intervention (RTI) identification model.

The RTI Model

This model arose because of a concern about the appropriateness of instruction. This is a very important exclusionary factor in definitions of SLD. Authorities need to show that the student was not experiencing learning problems because of inadequate, or poor instruction. Rather that they had received appropriate instruction that was evidence-based.

I can certainly comment that this is not the case in Victoria and I suspect that this is so in other States of Australia. Instruction is usually based on commercial products- books, programs and software. Selection of instructional methods is not driven by research evidence but by tradition, experience, popularity and current trends. This has always been the case. This is not to say that instruction is not appropriate and beneficial but little, if any, is based on so-called scientific-research-evidence.

Typically, students in primary school are more likely to receive support from a special education teacher or resource teacher than those students in secondary schools. While not necessarily scientifically-based or research based, students with literacy learning problems (usually reading problems) typically experience interventions using the popular Reading Recovery program or commercially available programs including

software which are the norm. Clearly, few if any of these, would qualify as being scientifically-based interventions.

For students applying for special consideration in their VCE examinations, the school is simple required to provide evidence of any type of educational intervention.

Clearly, the RTI requirement is not stringently applied in Victorian schools or for that matter, in Australian schools.

SOME KEY ISSUES

- the notion of a conceptual, theoretical definition compared to a functional, operational definition
- the exclusionary nature of most definitions of a Learning Disability
- clarification of the words-"significantly below expectations" and "discrepancy"
- what variable(s) should be chosen to establish the presence of a "significant discrepancy"- Age?, IQ?, Grade Level?
- need for a checklist of behavioural characteristics of a Learning Disability

CHARACTERISTICS OF A LEARNING DISABILITY

Most definitions of a learning disability can be described as being basically theoretical or conceptual in nature. While helpful for a general understanding of key components, they do not provide sufficient detail to enable teachers, psychologists and other professionals to readily and accurately identify students with a learning disability.

Operational or functional definitions that describe actual behavioural features associated with a learning disability have greater practical utility. In addition, checklists that outline the relevant diagnostic criteria are considered essential for the purposes of making a positive diagnosis and for providing educationally relevant information.

Unfortunately, few such checklists are available that provide a concise listing of relevant behavioural characteristics of a learning disability at key stages of academic learning.

The following checklists provide information about important characteristics that are frequently associated with a learning disability.

In using these checklists, the following points should be considered-

- The emphasis is clearly placed on what the author considers to be important "tell-tale" signs of a learning disability. Such signs or characteristics have been gleaned from practical experience as a teacher and psychologist over some several decades. It should be stressed that most of these signs can be readily identified by the classroom teacher through direct observations or a careful examination of a student's workbooks.

- Students with a learning disability, while frequently sharing common characteristics, represent a heterogeneous group, and hence, each student will display a unique profile of strengths and weaknesses.
- Most young students experience problems processing directional information including sequential and orientational/positional information. Hence, caution should be taken in not over interpreting such early difficulties and prematurely classifying a student as having a learning disability. It is the persistence and severity of such problems that enables a positive identification to be made beyond the early school years.
- The checklists reflect the gradual changing nature of the important characteristics of a learning disability from the pre-school and early primary school levels through to the senior secondary school level.
- The checklists can be used to support a positive diagnosis and to provide teachers with direct and explicit educational guidelines and specific instructional strategies.

CHARACTERISTIC SIGNS OF A LEARNING DISABILITY: SOME GENERAL DEVELOPMENTAL SIGNS

PRE-SCHOOL AND EARLY PRIMARY SCHOOL STUDENTS

The importance of directionality, including sequencing and orientation, in the development of basic academic abilities, is paramount. Students with a learning disability typically demonstrate underdeveloped directional concepts and processing skills including serial learning, identifying, retaining and producing sequential information and processing orientational/positional information.

Key signs of a learning disability can be identified during the pre-school and early school years. However, it is stressed that caution should be taken about prematurely identifying the presence of a learning disability as many young students experience significant problems processing directional information. Some key signs include the following-

ACTIVITY	**DIFFICULTY CONFUSION**
MOTOR SEQUENCING	
Tying shoe laces	
Putting shoes on correct feet	
Using crayons, pencils	
Using scissors	
Skipping, hopping	
DIRECTIONALITY	
Understanding directional concepts and words	
Left-right awareness/understanding	
Lateral preference (handedness) slow development/mixed	
Dressing-back to front, inside-out	
Setting table-knives and forks	
Letter, numeral reversals	
Placement of items in order (right to left placement)	
Spatial awareness-“lost” in familiar building	
Telling time, judging passage of time	
SERIAL (ROTE) LEARNING	
Birthday	
Address	
Phone Number	
Days in the week, months, seasons	

Alphabet	
REMEMBERING VERBAL SEQUENTIAL INFORMATION	
Instructions	
Commands	

CHARACTERISTICS OF A LEARNING DISABILITY
SOME GENERAL EDUCATIONAL SIGNS

PRIMARY SCHOOL STUDENTS

While signs of a developmental delay in the processing of directional information continue to be observable, with age and experience, they tend to diminish in intensity and the most prominent characteristic of a learning disability is academic underachievement.

Important signs of a learning disability are readily identifiable during the primary school years and include the following-

ACTIVITY	DIFFICULTY CONFUSION
MOTOR SEQUENCING	
Tying shoe laces	
Handwriting-	
• Printing	
• Cursive	
DIRECTIONALITY	
Understanding directional concepts and words	
Left-right awareness/understanding	
Writing letters and numerals-reversals	
Spatial awareness-"lost" in familiar buildings	
Telling time-analogue	
Maths- concepts, common fractions	
Map reading	
SERIAL (ROTE) LEARNING	
Birthday, address	
Phone number	
Days in the week, order of months, seasons	
Alphabet	
Number facts, maths tables	
Rules	
SEQUENTIAL RETENTION AND PROCESSING	

Reading-phonological skills, recognising words, comprehension	
Spelling-retaining and recalling words	
Writing-planning and structuring essays	
Maths-place value, number sequences, equations, algorithms	
Retaining, recalling spoken commands and instructions	

CHARACTERISTICS OF A LEARNING DISABILITY: SOME GENERAL ACADEMIC SIGNS

SECONDARY SCHOOL STUDENTS

Again, while signs of a developmental delay in the processing of directional information continue to be observable, with age and experience, they tend to greatly diminish in both severity and intensity. The prominent sign continues to be academic underachievement, usually in one or more of the literacy skills including handwriting, reading, spelling and written expression and in some areas of maths.

ACTIVITY	**DIFFICULTY**
	CONFUSION
MOTOR SEQUENCING	
Handwriting-	
• Printing-often a preference, faulty letter formation & spacing	
• Cursive-often messy, poor fluency/speed, rapid fatigue	
DIRECTIONALITY	
Understanding directional concepts and words	
Understanding some maths concepts, terms and signs,	

basic algorithms, fractions, algebra, areas of geometry	
Map reading and some geographical terms and concepts	
SERIAL (ROTE) LEARNING	
Rules	
Dates in history, literature, music	
Retaining and recalling poems, selections from plays, novels	
READING	
Underdeveloped word recognition and word-attack skills	
Slow reading rate	
Slow reading comprehension, retaining sequential information	
SPELLING	
Basic spelling errors, especially common “irregular” words	
WRITTEN EXPRESSION	
Faulty planning and structuring essays	
Faulty organisation, coherence and unity- “a word salad”	
Basic grammatical and punctuation errors	
Limited written output	
Slow productivity rate- “converting thoughts to print”	
STUDYING AND INDEPENDENT LEARNING	
Problems planning and organising study	
Faulty time management skills	
Slow reading rate, very reluctant reader, very limited reading	

SOME KEY ISSUES

- nature and type of underlying developmental difficulties
- the unifying concept of directional processing difficulties
- positional/orientational processing difficulties
- sequential processing difficulties
- associated educational difficulties
- changing nature of symptoms with age
- diminution of many signs at the senior secondary school level
- prominence of essay writing problems at the senior secondary level
- notions of discrepancy and severity

CHARACTERISTICS OF A LEARNING DISABILITY: LITERACY LEARNING SIGNS

Students with a learning disability in primary and secondary schools experience problems in academic learning arising from difficulties processing directional information.

In literacy learning, these problems are often demonstrated in the following areas:

Handwriting

- slow development of a preferred "hand"
- left/right confusion
- faulty pencil grip
- incorrect letter formation
- letter/numeral reversals
- usual preference for a printing style of writing
- inappropriate use of uppercase letters
- awkward and immature style
- inappropriate spacing
- slow writing rate
- prone to writing fatigue

Phonological Awareness

- difficulty with the perception, retention and manipulation of words in sentences, syllables in words and phonemes in words
- difficulty with the auditory and kinaesthetic sequencing of sounds in words

Reading

- letter reversals
- left/right confusions
- limited knowledge of the alphabet
- underdeveloped sight vocabulary and word-attack skills
- comprehension difficulties-retaining the sequence of information
- slow reading rate and/or difficulty modifying rate
- easily fatigued
- negative attitude to reading
- low level of confidence in reading
- limited recreational reading

Spelling

- letter-sound confusions
- letter reversals
- sequencing errors (both auditory and visual)

- underdeveloped visual memory for words, especially common, phonetically irregular words
- limited knowledge of spelling patterns and rules
- inappropriate phonetic spelling
- avoidance of difficult or unfamiliar words in written expression

Written Expression

- handwriting problems (often a preference for a printing style, inappropriate use of uppercase letters)
- basic, elementary spelling errors-especially under exam conditions
- slow rate of productivity-"converting thoughts to print"
- problems with sentence and paragraph structure, word arrangement and coherence (writing has a "word salad" appearance- basic sequencing problems)
- imprecise, unclear expression
- immature syntax and sentence formation
- apparent lack of planning, organisation and coherence
- disregard for writing conventions including incorrect use of punctuation
- use of restricted vocabulary

For learning disabled students, written expression presents significant challenges and great difficulties. To gain some appreciation of the problems confronting such students, the following points may be helpful-

- an obvious self-awareness of the discrepancy (and hence, substantial frustration) between their knowledge, thoughts and ideas and the "quality" of their written responses,
- their generally underdeveloped early literacy skills and the cumulative impact this has on the final domain of written expression,
- their very low confidence as a writer stemming from years of underachievement, constant criticism and obvious incompetence
- the generally slow, difficult, frustrating task of converting their thoughts to print
- a fundamental inability to maintain the sequence of thoughts in a coherent and fluent fashion throughout the essay, and
- a difficulty editing essays- identifying and correcting errors.

A CHECKLIST OF USUAL CHARACTERISTICS IN WRITTEN EXPRESSION

APPEARANCE

- messy handwriting
- a print script rather than a cursive script
- inappropriate use of uppercase letters

SPELLING

- basic errors, especially the misspelling of common, phonetically irregular words. Frequent errors include- homonyms (there-their-they're, hear-here, which-witch,

write-right), rule based errors (tense, plurals, adding suffixes), confusions (its-it's, of-off), some common errors (they-thay, their-thier, with-whith, which-wich, friend-freind, who-how, know-now, coming-comming, father-farther, dining-dinning, beginning-begginning, hoped-hopped, does-dose, any-eny)

WRITTEN EXPRESSION

- faulty sentence structure and unity-"a word salad"
- faulty paragraph structure and lack of coherence/unity
- limit output

SOME KEY ISSUES

- the hierarchical nature of the acquisition and development of literacy skills
- the critical role of early identification and intervention
- the need for continuing intervention throughout secondary school
- the emphasis on literacy skills required in the VCE Examination
- the prominence of essay writing difficulties
- remediation versus "special arrangements"/accommodations

CHARACTERISTICS OF A LEARNING DISABILITY: NUMERACY LEARNING SIGNS

Students with learning disabilities in primary and secondary schools experience problems in academic learning. The major causal factor is a consistently occurring directional confusion or uncertainty regarding the orientation and sequencing of information, for example;

- positional learning difficulties
- serial learning problems
- difficulties with short-term retention of sequential information
- slow rate of processing information (perception, organisation, integration, retention and retrieval)
- underdeveloped sense of time and order
- organisation and planning difficulties

In numeracy learning and mathematical understanding, these problems are often demonstrated in the following areas:

Basic Skills

- slow development of number concepts and processes

- number sequencing- counting, place value
- seriation and ordering
- incorrect formation of numerals
- reversal of numerals and transposition of digits
- reading and writing number words
- confusion of basic mathematical terms and symbols, e.g., algebraic symbols
- limited or incomplete knowledge of basic number facts including multiplication tables

Conceptual Understanding and Application

Temporal Concepts (e.g., before, after)

- telling time (digital and analogue, using clocks and calendar)

Spatial Concepts (e.g., under, below, beside)

- place value and its written representation
- fractions-numerator/denominator confusion
- geometry (2 and 3 dimensional)
- location in space (copying, recitation and processing)

Limited insight into interrelationship of basic maths processes

Terminology- "the language of maths"

- confusion concerning general and specific terms used in maths

Algorithms

- confusion regarding starting position of operation (directional confusion)
- difficulties with the alignment of numerals
- setting out and location in space of written work
- difficulties with notation
- perception and understanding of the four operational signs
- difficulty with the sequencing of required steps-the order of processes

Mental Computation

- retention of oral information
- computation (given limited knowledge of basic number facts)
- rate of calculation

Word Problems

- reading and understanding of problems
- determining relevant information
- appropriate sequencing of information

General

- copying from the whiteboard or a book
- remembering oral instructions

- reading written instructions and information
- spelling number words

Unlike Literacy Learning problems, students with Maths Learning problems have not been explored beyond the early Secondary School level in this **Section**.

ASSESSMENT OF STUDENTS WITH A LEARNING DISABILITY

During the primary school years, the classroom teacher is usually the first person to be concerned about a student's academic progress. Problems are generally most apparent in handwriting, reading and spelling and areas of maths. While many students experience problems with the acquisition and development of literacy skills, to be correctly diagnosed as having a Learning Disability, the following three criteria should be established-

- IQ of 70 or above
- significant underachievement in terms of measured literacy skills and current grade placement
- no obvious causal factor(s) of underachievement can be established

Traditionally, learning disabilities in the literacy skills of reading, spelling, handwriting and written expression have been studied far more extensively than learning disabilities in maths. Hence, the focus in this section is on the identification of learning disabilities in literacy learning.

INFORMAL ASSESSMENT

Initially, the classroom teacher, through direct observations and informal assessment, determines significant academic underachievement in literacy learning. Usually, the early concerns lead to formal assessment, often conducted by the special education teacher.

Together, the educational information gleaned from such assessments provides valuable directions for appropriate instruction.

FORMAL ASSESSMENT

Through formal literacy testing, a teacher can gain a more accurate measure of the student's actual underachievement and areas of need. Tests assess ability at different levels and can provide details on the following skills-

Reading

- phonological and phonic skills
- word recognition
- word-attack skills
- prose reading accuracy

- reading comprehension
- reading rate

Spelling

- accuracy

PROFESSIONAL REPORTS

Where concerns persist, the student is frequently referred to outside specialists including a psychologist, audiologist, optometrist, occupational therapist and/or speech and language therapist. The purposes of such referrals are to gain information that can lead to a differential diagnosis and to provide further information for remediation of the literacy learning problems. Most of the recommendations from the specialists focus on strengthening relevant underdeveloped basic abilities considered to be essential pre-requisites for literacy skill development.

PSYCHOLOGICAL REPORTS

A psychologist will usually assess the general cognitive abilities of a student referred by teachers or parents. While several relevant tests are available, most psychologists choose to administer the appropriate "WISC" of "WAIS" test, depending on the age of the student.

WISC AND WAIS PROFILES AND REPORTS

Many psychologists have inferred the presence of a Learning Disability following the administration of one of the "WISC" or "WAIS" tests.

The following profile characteristics are often used to infer a differential diagnosis of a Learning Disability-

- ACID (Arithmetic, Coding, Information, Digit Span)
- SCAD (Symbol Search, Coding, Arithmetic, Digit Span)
- Verbal Scale Scores v Performance Scale Scores
- Subtest Spread/Scatter
- Processing Speed Index Score (Coding, Symbol Search, Cancellation) and/or Working Memory Index Score (Digit Span, Letter-Number Sequencing and Arithmetic)

RECENT WISC/WAIS PROFILES AND REPORTS

With the introduction of the latest version of the WISC/WAIS tests, the following Index Scores have been used to infer a positive diagnosis of a Learning Disability.

- Working Memory (Digit Span, Letter-Number Sequencing, Arithmetic)
- Processing Speed (Coding, Symbol Search, Cancellation)

USEFULNESS OF WISC/WAIS REPORTS

A WISC profile analysis has some positive benefits, especially for pre-school and primary school students. Such possible benefits include the following-

- as an initial guide to the possible presence of a Learning Disability (average IQ or above)
- it can identify cognitive competencies and hence indicate that the student is not intellectually disabled or a "slow learner" and this usually has the very positive benefit of informing a student that he/she is "not dumb"
- through direct observations, it is possible to identify verbal and non-verbal processing difficulties (e.g., Information (serial learning), Arithmetic (retaining verbal sequential instructions), Digit Span and Letter-Number Sequencing (auditory short-term sequential memory), Block Design and Matrix Reasoning (directional uncertainty)
- it can identify preferred cognitive and learning styles (the influence of Howard Gardner,1993)
- it can identify subgroups (to demonstrate that students with a Learning Disability are not a homogeneous group, Sykes, 1976)

Caution, however, must be taken, not to over-interpret the educational significance of a Profile Analysis. The WISC/WAIS tests were not developed to provide educational/instructional guidelines.

There is not a direct, obvious link between profile analyses and instructions in literacy learning and numeracy learning or with the Victorian Curriculum (2018).

For senior secondary school students, the usefulness of the WISC/WAIS tests in providing educational guidelines is greatly diminished. Some valuable information can be gleaned to assist in choosing subjects and possible tertiary courses. A specific underdeveloped ability, such as vocabulary knowledge, can also be a useful finding and have important, direct educational implications. However, it is generally too late to use the WISC/WAIS scores to derive instructional guidelines for "remedial" reading, spelling and written expression. At Years 11 and 12, the emphasis should be mainly on determining eligibility for the classification of Learning Disability and the possibility of Special Examination Arrangements (i.e., an IQ at, or above 70).

SOME PROBLEMS INTERPRETING WISC/WAIS PROFILES AND REPORTS

The presentation of symptoms frequently associated with a Learning Disability varies according to the developmental level of the child/adolescent. Some symptoms (or precursors) of a Learning Disability may be present in the preschool age range, but typically a Learning Disability diagnosis is not made during the pre-school years. Identification is clearly best made early in the student's primary school years to derive the most useful educational information and to minimise learning frustration.

As there is no one, "tell-tale" sign of a Learning Disability, including a subtest score or an Index Score, it is not possible to accurately identify the presence of a Learning Disability from WISC/WAIS scores.

Several major authorities in the field of Learning Disability have consistently stressed this point. Some relevant quotations are provided below.

"The failure to find a unique WISC-R profile pattern for learning-disabled children is not surprising. Learning-disabled children represent a group that is too heterogeneous for one type of WISC-R profile to be typical of all or even most of its members...These results strongly suggest that a child's WISC-R profile should not be used to establish a diagnosis of learning disability….At present, there is no unique WISC-R profile that is reliably diagnostic of a learning disability." (Sattler, J.M., 1990, p.610).

"There may be underlying abnormalities in cognitive processing (e.g., deficits in visual perception, linguistic processes, attention, or memory, or a combination of these) that often precede or are associated with Learning Disorders…..the presence of such conditions does not invariably predict an eventual Learning Disorder, and there are many individuals with Learning Disorders who have no such history." (DSM-1V, 1994, p.47).

"In summary, although some patterns on the WISCs are reported fairly consistently for children with learning disabilities, these patterns do not have adequate power on which to base differential diagnosis. The ACID and SCAD profiles may provide useful information about a child's cognitive abilities on a case-by-case basis, but the presence or absence of these profiles cannot justify making a diagnosis of LD. Likewise, the V-P or P-V profiles do not provide evidence in and of themselves of a learning disability. Many "variables-including performances on standardized measures of achievement, academic history, developmental history, medical history, family history and behavioral observations-must be combined to properly evaluate a child with a potential learning disability. Although it seems as though a cut-and-dry cognitive profile of a typical learning disabled child would ease the process of diagnosis, characterizing a child by means of a single score or combination of scores can never provide adequate information about his or her abilities." (Kaufman and Lichtenberger, 2000, pp., 205-206).

"The attempts to find a unique WISC-111 test pattern among children with learning disabilities have not been successful….There is no evidence that Verbal-Performance discrepancies can identify learning disabilities. Similarly, there is no evidence that a cluster of low scores on a subtest profile-such as (a) ACID (Arithmetic, Coding,Information and Digit Span or (b) SCAD (Symbol Search, Coding, Arithmetic and Digit Span) or…. can reliably distinguish children with learning disabilities from those who do not have learning disabilities." (Sattler, J.M., 2002, p.303).

"Children with Reading Disorders displayed a relative deficit in Working Memory. Their mean Working Memory Index was 6 points lower than their average Index on VCI, PRI and PSI. This pattern is consistent with other evidence that children with reading disorders often have working memory problems. It is by no means clear, though, whether this pattern is due to problems with mental sequencing, auditory processing, mental manipulation, or some other factor." (Flanagan and Kaufman, 2004, p.198).

"...profile analysis with the WISC-1V cannot be used to arrive at a diagnostic label" (p.114).

"There are no WISC-1V profiles that are known to reliably distinguish clinical groups from normal groups". (p.141).

"Intelligence test scores, in and of themselves, should never be used as a basis for establishing a learning disability diagnosis. No pattern or Index scores or subtest scores necessarily indicates a learning disability. Also, accurate documentation of academic achievement, among other things, is necessary for a diagnosis of learning disabilities". (p. 142). (Sattler, J.M., and Dumont, R., 2004).

"Although the definition of learning disability continues to be elusive and children with this label represent an extraordinarily heterogeneous population, the common

characteristically shared by children with learning disabilities is academic underachievement.” (p.393).

“We strongly recommend never diagnose a learning disability on the basis of a discrepancy between any two WISC-1V indexes, such as Verbal Comprehension and Perceptual Reasoning, or between any two Indexes or other individually administered intelligence tests...It is extremely poor practice to rely exclusively on patterns of scores on an intelligence test to arrive at a diagnosis of learning disability”. (p.414). (Sattler,J.M., and Hoge, R.D., 2006).

“No single data source is sufficient for a diagnosis of specific learning disorder. Rather, specific learning disorder is a clinical diagnosis based on a synthesis of the individual’s medical, developmental, educational and family history; the history of the learning difficulty, including its previous and current manifestations; the impact of the difficulty on academic, occupational, or social functioning; previous or current school reports; portfolios of work requiring academic skills; curriculum-based assessments; and previous or current scores from individual standardized tests of academic achievement”. (DSM-5, 2013, p.70).

The DSM-5 continues on this critical point. Individuals with SLD typically (but not invariably) display poor performances on psychological tests of cognitive processing. "However, it remains unclear whether these cognitive abnormalities are the cause, correlate or consequence of the learning difficulties". (p.70).

Although cognitive deficits associated with difficulties learning to read words are well documented (See comments on phonological processing in the following Sections-Reading, and especially Dyslexia, p.47, pp.52-53) those associated with other manifestations of SLD (e.g., reading comprehension, arithmetical computations, written expression) are underspecified or unknown.

Furthermore, individuals with similar behavioural symptoms or test profiles are found to have a variety of cognitive deficits and many of these are also found in other neurodevelopmental disorders (ADHD, ASD, Communication Disorders, Developmental Coordination Disorders).

"Thus assessment of cognitive processing deficits is not required for diagnostic assessment. …cognitive testing, neuroimaging or genetic testing are not useful for diagnosis at this time". (p.70).

As early as 1984, Kavale and Forness argued that profile analysis of the WISC scores is not useful in the differential diagnosis of learning disorders.

Prifilera, Saklofske, Weiss and colleagues (2005; 2008) discussed this assertion in detail and provided the following analysis.

They stated that the value of this type of research has been helpful to “put the brakes on cookbook, simplistic interpretations of test results devoid of the contextualism of the individual’s unique life characteristics”. (2005, p.16).

“In psychology and education, it is rare that one test or score is in and of itself diagnostic of a specific disorder”. (2005, p.15).

“Without other corroborative and/or exclusionary evidence, basing a diagnosis on one test score alone can lead to false conclusions”. (2005, p.16).

“Just looking at profiles of test scores… leads to erroneous diagnostic decisions because subtest patterns in and of themselves are not conclusively diagnostic of a disorder”. (2008, p. 16).

However, they contended that “ the criticism of the practice of profile analysis as the sole piece of information used to make a diagnostic decision has often become a “straw man” argument and has been used to justify elimination of IQ and other psycho-educational tests, which is tantamount to the proverbial throwing out the baby with the bath water". (2008, p.16).

They continued “What well-trained clinicians simply rely on test results or patterns as their sole source of information when performing an assessment?" (2008, p.16).

Disappointingly, my experience of reviewing psychological reports for special education funding and special examination provisions over several decades shows a too frequent reliance on an IQ test profile to make a diagnosis of a disability, especially a learning disability or dyslexia. In one recent case, a student was diagnosed with dyslexia on the basis of a Coding percentile ranking of 63, (i.e., a score within the average range) as this was the lowest score on the test profile. In many cases, there is no assessment of academic skills to establish the critical evidence of significant underachievement in reading, spelling and /or written expression.

The most frequently cited information to support their assertion in these reports is drawn from Prifitera, Saklofske and Weiss (2005, p.81) and their 2008 book on page 27 which has only very minor changes to the 2005 text. It relates specifically to the WISC-1V Processing Speed Index (PSI) score.

The following quote is typically paraphrased in these psychological reports and its source is rarely acknowledged.

“Performance on the PSI is an indication of the rapidity with which a student can process simple or routine information without making errors. Many learning tasks involve a combination of routine information processing (such as reading) and complex information processing (such as reasoning). A weakness in the speed of processing routine information may make the task of comprehending novel information more time-consuming and difficult. A weakness in simple visual scanning and tracking may leave a child less time and mental energy for the complex task of understanding new material. This is the way in which these lower order processing abilities are related to higher order cognitive functioning”.(2005, p.81).

Several points are worth making about the above quote.

Firstly, it is correct to indicate that the PSI measures the speed at which an individual can process simple, lower-order information. The skills involved, both visual and motoric, are basic. To elaborate, the subtests of the PSI measure the following-

Coding-copying symbols that are paired with numbers within a specified time limit of 120 seconds.

Symbol Search- scanning a target group of two symbols and indicating whether a matching symbol can be identified in a search group of 5 symbols within a time limit of 120 seconds. Individual indicates answer by marking the "Yes" box or the "No" box.

Cancellation- scanning both a random and a structured arrangement of pictures and marking target pictures within a specified time limit of 45 seconds.

Secondly, the term “reading” must be referring to basic, word recognition skills not reading comprehension. Obviously, reading comprehension is a higher-order ability.

Thirdly, the authors contend that a weakness in processing routine information **may** leave an individual with less time and mental energy for higher-order, complex tasks. Reading comprehension and essay writing would qualify as such cognitive tasks. The authors do not provide any empirical evidence to substantiate their claim.

Some psychologists, using the above information, argue that a low PSI score is an indication of a learning disability in reading and/or written expression. They then recommend that a student needs extra time in exams to cater for their learning disability/dyslexia. Typically, they fail to provide corroborative evidence, in the form of academic underachievement, especially in the critically relevant areas of reading comprehension ability and essay writing rate, to support such claims.

Interestingly, the evidence from the applications for special examination provisions overwhelming fails to show that a low PSI is associated with slow reading comprehension rate and/or slow essay writing rate. As the applications require IQ details together with a student’s results on a reading comprehension test and their essay writing ability (which includes rate of productivity), any association between profile details and academic abilities can be readily identified.

REPORTS FROM OTHER PROFESSIONALS

Teachers and/or parents frequently refer students to one or more of the following professionals-

- audiologists
- optometrists
- speech and language therapists
- occupational therapists
- medical practitioners

Reports from specialists can obviously be extremely valuable for pre-school and primary school students who are experiencing early learning difficulties. These reports can provide teachers with highly useful information to better understanding the possible nature and cause(s) of learning problems and to provide directions for appropriate educational and instructional strategies.

Generally speaking, the relevance of such reports diminishes as students reach the senior secondary school level.

AUDIOLOGIST REPORTS

Information is provided in areas such as the following-

- Basic hearing
- Auditory processing
    - auditory figure-ground
    - dichotic listening
    - short-term auditory memory (STAM)
        - digit span
        - phonemic discrimination and synthesis
        - sentences

OPTOMETRIC REPORTS

Typical information provided includes the following-

- Vision and eye structure
- Eye alignment
- Focus ability
- Eye movements
- Colour vision
- Perceptual abilities
    - visual-motor
    - figure-ground
    - visual analysis
    - visual memory
    - laterality/directionality
    - auditory analysis
- Eye tracking

SPEECH AND LANGUAGE REPORTS

Information is usually provided in some of the following areas-

- Articulation and speech
- Phonological skills
- Oral language
    - word knowledge
    - syntax
    - semantics
- Written language
    - reading
    - spelling
    - written expression

OCCUPATIONAL THERAPY REPORTS

Typically, details are provided on the following-

- Gross and fine-motor skills
- Visual-motor integration
- Handwriting legibility

- Handwriting speed ("The quick brown fox jumped over the lazy dog")
- Typing speed test
- Fine-motor observations

MEDICAL PRACTITIONERS

Reports from GPs, Paediatricians, Neurologists and other medical specialists, whilst not providing the necessary, relevant, primary evidence to identify a Learning Disability, do provide very helpful information about developmental and health issues.

LEARNING DISABILITY
AND
THE CONCEPT OF DIRECTIONALITY

A broad range of factors can contribute to academic learning problems. One factor common to many students with learning difficulties and a defining problem for students with a learning disability is persistent directional confusion which can result in uncertainty regarding:

- orientation-physical or positional location in space of visual-spatial information
- sequencing-successive arrangement of motor, visual or auditory information

Such uncertainty can be demonstrated in-

- slowly developing lateral awareness
- uncertain lateral awareness
- directional learning difficulties
- serial learning problems
- difficulties with short-term retention of sequential information
- slow rate of processing sequences of information (motor, visual and auditory)
- underdeveloped sense of time and order
- organisation and planning difficulties (spatial and temporal)
- time management problems

Students experiencing such directional confusion can present a real challenge to the classroom teacher, especially in the areas of early literacy and numeracy instruction.

The information below attempts to provide teachers, psychologists and other professionals with an insight into the concept of directionality and its relevance to the teaching of students with a learning disability.

DIRECTIONALITY IN BASIC ABILITIES

The importance of directionality as both a concept and an ability, including orientation and sequence, in the development of the following basic abilities is evident. These abilities are observable in very young children and form the basis for academic learning.

MOTOR ABILITIES

Gross motor patterns:

- balancing, climbing
- walking, hopping, skipping
- throwing, catching

Fine motor fluency and coordination:

- articulation, pronunciation
- scribbling, cutting, drawing, colouring, copying, writing, tying

PERCEPTUAL ABILITIES

Visual:

- discrimination of orientation of objects, shapes
- discrimination of sequence of objects, shapes

Auditory:

- discrimination of sequence of sentences, words and phonemes

MEMORY ABILITIES

Motor:

- retention of sequence of motor patterns

Visual:

- retention of orientation of objects, shapes

- retention of sequence of objects, shapes

Auditory:

- retention of sequence of sentences, words, phonemes

LANGUAGE ABILITIES

Articulation

- production of sequences of speech sounds

Grammar

- awareness and production of grammatical sequencing of words

Semantics

- awareness and production of meaningful sequences

CONCEPT FORMATION

- directional, positional, temporal concepts

(See Early Learning Essentials 2 : Language Development and Concept Formation).

ASPECTS OF DIRECTIONALITY IN EARLY ACADEMIC LEARNING

The role of directionality including orientation and sequence is most evident in the following areas of early academic learning.

MOTOR SKILLS

- **Cutting**: fine motor sequencing
- **Drawing**: awareness of orientation and fine motor control
- **Writing**: letter and numeral formation requires fine motor sequencing; fluent, sequential fine motor skills required for cursive script

ORAL LANGUAGE SKILLS

- **Listening**: understanding sequential aural information; auditory discrimination, identification and retention of speech sounds
- **Speaking**: auditory sequential retention and manipulation of speech sound units; production of sequences of oral information

WRITTEN LANGUAGE SKILLS

- **Reading and Spelling**: all oral skills outlined above; visual discrimination of orientation of graphemes; visual sequencing of graphemes within words and words within sentences; sequential matching of graphemes and phonemes; visual memory of orientation and sequencing of letters in words
- **Handwriting**: awareness of orientation of graphemes; sequencing of fine motor movements
- **Written Expression**: sequencing of thoughts and their written representation

SERIAL LEARNING

- Such learning requires retention of sequential information (alphabet, counting, days in the week, months of the year, multiplication tables, etc.)

(In my practice, it is so apparent that students are very aware of their problems in this area and frequently declare, during assessment that they are "not good at days and months, date of birth", etc.).

NUMERACY SKILLS

- **Counting**: sequential activity
- **Numeration and Notation**: recognition of orientation of numerals, sequencing of fine motor movements in formation of numerals, sequencing of graphemes in number words
- **Place Value**: positioning and sequencing of numerals
- **Basic Number Facts**: retention of sequences of information
- **Mental Computation**: application of sequences of information
- **Basic Algorithms**: sequential processing of information
- **Time**: spatial and temporal awareness
- **Measurement and Spatial Relationships**: positional and spatial concepts

Teachers at the pre-school or early primary school level should play a significant role in developing directional skills in young children. By being aware of the central role of sequencing and orientational skills in early academic learning, teachers can emphasis these aspects in their instruction and identify and address any developmental delays in a child's directional skills.

While many aspects of directionality, as indicated above, are apparent through direct observation, some aspects require specific assessment.

LEARNING DISABILITIES: A CONCEPTUAL FRAMEWORK OF DIRECTIONAL FACTORS

This framework attempts to indicate the pervasiveness of directional processing skills in learning. While many other factors contribute to successful learning outcomes as indicated in the table headed "A Conceptual Framework of Development and Learning", under the topics of Basic Abilities, Learning Differences and Basic Characteristics, in this **Section**, the processing of directional information plays a very significant role for learning disabled students.

The framework shows the subskills under the different academic domains and indicates whether Sequencing (S) or Orientation (O) skills are implicated. In addition, the model also shows three levels of functioning-

- Educational
- Psychological; and
- Neurological

Possible causal factors are also provided.

THE EDUCATIONAL LEVEL

LITERACY LEARNING

HANDWRITING	READING	SPELLING
Letter formation (O)	Alphabet (S)	Retention of words (S)
Word formation (O/S)	Letter recognition (O)	Recalling words (S)
Printing (O/S)	Word recognition (O/S)	
Cursive (O/S)	Prose reading (S)	
	Comprehension (S)	
	Reading rate (S)	

WRITTEN EXPRESSION

Planning (S)
Sentence structure (S)
Paragraph structure (S)
Coherence/Unity (S)
Spelling (S)
Punctuation (S)

GENERAL LEARNING

SERIAL LEARNING

Days in week (S)

Months in Year, Seasons (S)

Recalling birth date (S)

Recalling address (S)

Recalling telephone number (S)

Reciting alphabet (S)

Reciting poems (S)

Reciting sequential information (S)

MATHS

Rote counting (S)

Writing numerals-reversals (O)

Numeration and notation (S)

Number bonds (S)

Number facts-"tables" (S)

Number sequences (S)

Number sentences-equations (S)

Basic algorithms-steps (S)

Common fraction (O)

Decimal fractions (S)

Telling the time-analogue (O)

Telling the time-digital (S)

Reading maths words/problems (S)

Spelling number words (O/S)

GENERAL SKILLS

Retaining spoken instructions (S)
Retaining written instructions (S)

STUDYING/INDEPENDENT LEARNING

Planning and Organisation (S)
Time Management (S)

Attempts to explain the cause of a Learning Disability usually focus on problems/dysfunctions/differences at one or more of the following levels-

THE PSYCHOLOGICAL LEVEL

THE SKILLS INVOLVED IN PROCESSING, RETAINING AND REPRODUCING

SEQUENTIAL AND ORIENTATIONAL INFORMATION

THE NEUROLOGICAL LEVEL

THE INTEGRITY OF THE DIRECTIONAL FUNCTION

LOCATED WITHIN THE PARIETAL AND OCCIPITAL LOBES

POSSIBLE AETIOLOGY

GENETIC/FAMILIAL PREDISPOSITION

MATURATIONAL DELAY/DIFFERENCE

Irrespective of causation or assumed neurological or psychological deficits, the challenge for the teacher is the selection of the most appropriate instructional method(s)/strategies to give the student the best chance to acquire and develop the basic general, literacy and numeracy skills essential to be successful learners.

GENERAL INSTRUCTIONAL GUIDELINES

Teachers need to be aware that directional confusion affects the academic learning and organisational skills of many students. The following guidelines should assist in the instruction of many students who experience particular difficulty with the processing of sequences of information, with the orientation of symbolic information or with spatial awareness generally.

For successful learning, these students require information and committed teachers who:

- have a thorough knowledge of the process of academic skills development
- are aware and understanding of the difficulties experienced by the student
- acknowledge and respect individual differences in

    - learning styles, preferences, strengths, weaknesses and rates
    - perception, retention and use of information

- are prepared to adapt

    - teaching methods and styles
    - level of instruction
    - rate of presentation of information
    - materials
    - assessment methods

- are committed to the enhancement of the self-esteem, identity and dignity of the student

Students with learning difficulties/learning disabilities need systematic, precise, explicit and often intensive teaching incorporating:

- use of concrete aids where necessary
- sequential presentation of material
- limited amounts of information to be processed
- reinforced repetition
- use of multisensory techniques and varied presentation
- success for the student

Some more specific aspects of the required explicit instruction include:

- establishing an individual student's knowledge/skill base
- a well organised and predictable environment
- clearly structured lessons including:

    - review of previous lesson
    - skill development

- opportunity for both guided and independent practice

- multisensory techniques and activities

- using apparent learning strengths
- development of apparent difficulties
- integration of learning
- variety of presentation, methods, materials, and tasks (visual, auditory, kinaesthetic and tactile)
- use of concrete materials
- constant linking of action and language
- teacher awareness of complexity of written material

- maximum opportunity for learning

- maximise "on task" time
- active involvement (attending, individual or group work)
- minimise distractions (visual, auditory, physical, interruptions)

- clear presentation of new skills and concepts*

- at appropriate instructional level
- sequential
- small amounts of new information
- new information explicitly linked to current knowledge
- short, simple, precise explanations and instructions
- check student understanding
- slow, clear speech by teacher
- pertinent information highlighted
- use of modelling by teacher
- avoid subtleties of language (e.g., sarcasm)

***(See Section- Early Learning Essentials 2: Language Development and Concept Formation)**

- opportunity for guided, reinforced student practice

- application of new skills or knowledge through independent or group work
- use of skills in a meaningful, relevant way
- opportunity for a high success rate
- teacher monitoring and provision of corrective feedback
- over learning; repeated experiences

- constant review; systematic and cumulative revision of material
- development of metacognitive strategies to encourage independence in learning

- consideration of modified assignments, homework requirements and assessment procedures

  - allow for alternative presentation of material (e.g., oral, taped, diagrammatic, 3D)
  - provide models and guidelines of requirements
  - offer guidance in structuring time and organising materials
  - monitor progress allow time extensions where appropriate
- demonstration of a positive regard for the student

  - acknowledge student's, attributes and achievements
  - allow for demonstration of above
  - appropriate accommodation of difficulties
  - realistic expectations of what and how much material is to be learned
  - provision of positive feedback
  - encouragement of developing independence

INSTRUCTION

In my psychoeducational reports, specially selected instructional strategies that derive directly from the test profile and behavioural observations, are provided. It is planned that these recommendations will give teachers explicit educational and instructional guidelines and relevant activities.

AWARENESS

The first and most important recommendation is for the teachers to be **AWARE** of the nature of a learning disability.

To improve the effectiveness of instruction, it is essential that the basic characteristics of a learning disability and, consequently, the implications for teaching, are understood.

KEY KNOWLEDGE

The fundamental difficulties experienced by learning disabled students are a severe and persistent difficulty processing and retaining sequential and orientational/positional information. Such information can be visual, auditory or motoric. In most cases, all three modalities are implicated.

Typical tell-tale signs include the following-

- problems with **serial learning** (alphabet, days in week, months in year, seasons, birthday, address, telephone number)
- problems retaining and processing **sequential information**

  - visual-words (wholes and letter sequences), number patterns and order, number sentences/equations

- auditory-listening, phonological skills-manipulating, blending, number facts and sequences
- motoric-skipping, tying shoe-laces, handwriting

    - problems processing **directional/positional information**
        - visual-letter and numeral reversals, telling the time, shape and pattern confusions, maths signs
        - motoric-handwriting-faulty letter and numeral formation, dysfluency

It is imperative that instruction in reading, spelling, handwriting, written expression and maths is planned with these "problem-areas" in mind.

SOME SPECIFIC INSTRUCTIONAL STRATEGIES

Specific recommendations are listed below starting from the **BASIC SKILLS** which are considered to be essential for later learning success. These have greatest relevance when teaching young children or older underachieving students.

Suggested activities in the basic academic areas follow.

BASIC SKILLS

It should be noted that the skills presented below are those directly relevant to the acquisition and development of the basic academic skills.

The Early Learning Checklist (see the **Learning Readiness Section**)

The Directional Abilities Checklist (See Early Learning Essentials 1: Directionality) and **The Perceptual Abilities Test** contain examples of the types of auditory and visual skills considered important in the early development of academic skills and hence provide a useful guide for teachers.

Auditory Processing Skills

<u>Auditory Sequential Memory</u>

Some suggested activities-

- Repeating series of digits, letters and words. Increase number of items in a series and time intervals between items.
- Immediate recall of meaningful verbal information-
- Repeating sentences
- Repeating or retelling short passages
- Paired-associate learning- learning and remembering list of word pairs
- Listening to short stories and answering questions-literal and interpretive
- Identifying missing items or rearranging sequences-e.g.,

    - 2, 6, 4, 9 — 2,6,?,9
    - crater, cold, window — crater, window, cold
    - 1, 7, 4, 8 — 1, 4, 7, 8

- Remembering short instructions-e.g.,

  Put a cross in the circle, a tick in the square and underline the triangle.

- Develop coding, chunking and rehearsal strategies.

Phonological Skills

Identification of sounds within spoken words-

- Clapping sounds in words
- Counting sounds in words-using blocks or counters if necessary

Identifying sounds within spoken words

- initial
- final
- medial

Blending sounds into words

- e.g., c-r-a-b-crab

Manipulating sounds within words

e.g., take the "t" out of "stack" and say the word (sack)

See also the many activities provided in the Reading Section under Phonological Skills.

Phonic Skills

For example-

- Reciting the alphabet
- Letter-sound correspondence
- Spelling patterns

  - Consonantal blends
  - Vowel blends

See the many activities provided in the Reading Section under Phonic Skills and Graphophonic Skills and in the Spelling Section.

Visual Processing Skills

Visual Discrimination of Shapes, Patterns, Letters and Words

Activities are included in the **Early Learning Checklist (Sykes, 2000)**.

Visual Memory for Shapes, Patterns, Letters and Words

- Reproducing geometric shapes from memory-show card with items, remove and have student recall items.
- Reproducing series of digits, letters, words and sentences. Expose item for approximately 5 seconds, remove/cover and have student write from memory.
- Identifying missing or changed items in a series. Two cards are shown with student required to identify difference(s).
- Develop coding, chunking and rehearsal strategies.

Additional activities are included in the **Early Learning Checklist (Sykes, 2000)**.

Reading

For younger students

- paired reading, including Books on Tape
- flashcard drill and games, especially the common "demons"
- phonological exercises-discrimination, manipulation and blending sound sequences
- phonic exercises
- visual dictation
- computer aided instruction
- reading comprehension-including cloze activities
    - sentences
    - paragraphs
    - short stories

For older students

- Reading vocabulary (synonyms and antonyms). Including Flashcards with a key word on the front of the card and its synonym/antonym on the back. Student looks at the front word and "learns" the associated word on the back.
- General expansion of vocabulary, dictionary and thesaurus activities.
- Reading comprehension -Reading for understanding (sentence, paragraph and story).

pre-reading strategies
text preview
story impressions
retelling
literal
inferential
cloze
concept maps
5 Ws who, where, why, what, when?

- Computer-aided instruction in reading

Additional activities are included in the **Reading Section**.

Spelling

<u>For younger students</u>

- flashcards of basic, common words-colour coded on back. A useful activity is to have a difficult word for a student, eg., "any" printed on the front of the card in black and on the back have the same word with the "error/problem/tricky part", in this case, usually the "a", written in red. Other basic words (e.g., from the Dolch Basic Word List or other Basic Word Lists) with colour coding of the "error" on the back, form a bank of words to be used to play several games. The aim of this activity is to have the student "visualize" and remember the tricky part of the target word. The card could be placed before the student (right-side/black-side up) then asked-What is the "tricky part/the red part" in this word on the back? If unsure, the student can check and then answer. The key is the repeated exposure to the correct spelling with colour cueing. The bank of words also provides words to spell orally or in writing. These are the basic, essential words that the student must learn to spell to become a competent writer.
- mark only two or three errors per page of a student's free/creative writing. Underline the word and tick the correct letters in the word. Place these words at the bottom of the page and record in the back of the book and place on a flashcard.
- a strategy for teaching new words (limit to about four words)

    - parent/teacher SHOWS and SAYS the target word and repeats in sentence
    - student LOOKS, SAYS the word and then SAYS each letter
    - parent/teacher COVERS the word
    - student SAYS the word, WRITES the word SAYING each letter as written
    - student COMPARES word to target word
    - if correct, praise and proceed
    - if incorrect, student IDENTIFIES error and corrects-praise effort

- a strategy for testing/revising spelling (limit to about four per session)

    - teacher/parent SAYS the target word and repeats in a sentence
    - students REPEATS the word
    - student WRITES the word, SAYING aloud each letter as written
    - student COMPARES word to target word
    - if correct, praise and proceed
    - if incorrect, student IDENTIFIES error and corrects-praise effort

- when "marking" errors, provide encouragement by ticking the correct letters in a word
- visual dictation-tapping letters written on a white-board and have student "read" the target word.
- dictation-short passages
- computer aided instruction

Spelling and Written Expression

For older students

- Flashcard activities-colour coding (see above details)
- Spelling patterns and rules
- Metacognitive strategies for rules
- Computer-aided instruction in spelling and essay writing (e.g., Superspell and Inspiration 11)
- The use of mind maps and concept webs to assist in the planning, organisation and structuring of essays.

Some of the activities also included under the **Spelling Section** and **Written Expression Section** above are also appropriate.

Handwriting

For younger students

- white-board and bright coloured pens
- co-active patterning
- fluency patterning
- check correct pencil grip
- co-active letter formation
- check correct formation of letters and numerals (watch for reversals)
- dictation-short passages

Mathematics

Several predictable errors and error patterns are committed by young students with a learning disability. Most of the errors made by learning disabled students stem from a basic **directional** uncertainty or confusion- acquiring basic "directional" concepts, identifying, counting or retaining **sequences**, order and patterns, retaining number bonds, facts and tables, order of steps in basic algorithms, decimal fractions etc., and processing **orientational/positional** information- positional concepts (e.g., left and right) telling the time, reading maths signs, common fractions and geometric positions.

Awareness of these fundamental problems will focus teachers' attention to these areas. Appropriate instruction must be explicit, sustained, repetitive and systematic.

Key Areas of Mathematics

Number

e.g.,

- basic number concepts
- basic number facts
- basic algorithms
- common fractions
- decimal fractions

Measurement and Geometry

- especially time

Statistics and Probability

See other sources of information concerning instructional strategies including-

The **Early Learning Checklist** in the **Learning Readiness Section**.

Activities in the **Mathematics Section**

General Instructional Strategies

Some general instructional strategies that should assist in improving the student's confidence as a learner are as follows-

- clear and concise instructions
- use of concrete cues, blocks, pictures, diagrams
- cueing and prompting
- use of metacognitive strategies to assist learning (e.g., spelling rules)
- regular comments of reassurance and encouragement
- repetitive practice
- a warm, caring, encouraging learning environment

RESOURCES

LINKS

Dyslexia Toolkits

The Dyslexia Toolbox. An Essential Resource Provided by the National Centre for Learning Disabilities. (NCLD). USA. 2012.

www.readingrockets.org

Addressing Dyslexia Toolkit. Dyslexia Scotland. 2017.

https://www.addressingdyslexia.org

Professional Associations

British Dyslexia Association	www.bdadyslexia.org.uk
Canadian Dyslexia Association	https://dyslexiacanada.org/
National Centre for Learning Disabilities	https://www.ncld.org/
SPELD Victoria	www.speldvic.org.au/

Texts and Resources

ACER	www.acerpress.com.au
Amazon Books	www. amazon.com
Pearson Australia	www.pearson.com.au/
Pearson UK	www.pearsoned.co.uk/bookshop/

Teacher Resource Books and Software

ACER	https://shopacer.ed.au/
Amazon	https://uedata.amazon.com
Campion Education	http://www.campion.com.au/
Dominie	www.dominie.com.au
Edalive	www.edalive.com/products
Edresources	https://www.edresources.com.au
Edsoft	www.edsoft.com.au
Fitzroy Programs	www.fitzprog.com.au/
Hawker Brownlow Education	www.hbe.com.au/
Link Educational Supplies	www.linkeducational.com.au
Wooldridges	www.woldridges.com.au

SOME RELEVANT LITERATURE

Predictably, this important area in the field of special education continues to dominate both relevant books and journal publications. I have chosen a few articles/books that I consider provide a sample of the more important developments in this extensive area.

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