UNIT 2 SPECIFIC LEARNING DISABILITIES (SLD)

Structure
2.0 Introduction
2.1 Objectives
2.2 Definition and Meaning
2.3 Differential Diagnosis
2.4 Classification
  2.4.1 Specific Reading Disability
  2.4.2 Specific Writing Disability
  2.4.3 Specific Mathematics Disability
2.5 Brain and Learning Disability
  2.5.1 Minimal Brain Damage
  2.5.2 Mixed Brain Dominance
  2.5.3 Syndrome Analysis
  2.5.4 Neuroplasticity
2.6 Intervention
  2.6.1 Reading
    2.6.1.1 Developmental Approach
    2.6.1.2 Direct Reading Activity Approach
    2.6.1.3 Linguistic Approach
    2.6.1.4 Gillingham Method
    2.6.1.5 Language Experience Approach
    2.6.1.6 Multisensory Method
    2.6.1.7 Programmed Reading
    2.6.1.8 Cognitive Behavioural Method
    2.6.1.9 PASS Method
  2.6.2 Writing
    2.6.2.1 Developing Basic Readiness Skills
    2.6.2.2 Cognitive-Behavioural Strategies
    2.6.2.3 Mnemonic Method
    2.6.2.4 Computer-Assisted Writing Instruction (CAWI)
    2.6.2.5 Test-Study-Test Technique
  2.6.3 Mathematics
    2.6.3.1 Cognitive-behavioural Approach
    2.6.3.2 PASS Method
2.7 Let Us Sum Up
2.8 Answers to Self Assessment Questions
2.9 Unit End Questions
2.10 References
2.11 Suggested Readings
2.0 INTRODUCTION

In this Unit we will learn about specific learning disability which has become a major concern among the parents of late. Specific learning disability (dyslexia, dysgraphia, and dyscalculia) afflicts 5-15 percent of school-going children in India (Karande, Sholapurwala & Kulkarni, 2011). Awareness about it is increasing and appropriate interventions at the right time will help the children with specific learning disabilities overcome the limitations and lead a useful and productive life, and contribute to the society.

2.1 OBJECTIVES

After studying this Unit, you will be able to:

- classify specific learning disabilities in school children;
- distinguish one form of learning disability from another;
- describe each of these disabilities; and
- know about the intervention programmes for learning disability.

2.2 DEFINITION AND MEANING

In spite of average or above average intelligence and adequate schooling some children lag behind in their academic skill acquisition. These children are generally considered as learning disabled. Learning disabilities are diagnosed particularly when children start going to schools and are engaged in academic activities with other children in the school. Academic skill acquisition involves one or more of the basic psychological processes, such as attention, perception, memory, logical thinking and so on. When there is some deficit in these basic processes required in understanding or using language, spoken or written; it may be manifested in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. In spite of their average or above average intelligence, they have difficulty in learning scholastic skills. The disorder is called ‘specific learning disability’. The disability is ‘specific’ in the sense that this can be differentiated from other general forms of deficits that affect acquisition of other skills in general, such as mental retardation. Although even a person with mental retardation can have learning disability if there is a major discrepancy between intelligence and the index skill, generally mental retardation is excluded from this category. Hence, ‘specific learning disability’ includes those skill deficits which are confined to scholastic performance in subjects like reading, writing and arithmetic. Even having average or above average intelligence, these children perform poorly in these academic tasks. Learning disability is believed to be present if there is ‘substantial’ difference between expected and actual performance based on intelligence, ruling out other contributing factors such as poor learning-teaching environment, second language etc. For diagnosis of specific learning disability the person should not only have at least average intelligence, but should have adequate opportunity for learning. The child should be free from sensory impairment if any, that could affect learning. These are the necessary conditions for the identification of children with learning disability. Here, ‘substantial’ difference means the difference between level of intelligence and academic performance is technically more than two standard deviations on a standardised test of academic achievement, measuring these academic skills.

Now in countries like USA, this disability is identified by using alternative measures called response to intervention (RTI). Instead of using standardised tests alone, the client’s response to intervention in specific areas of underachievement is examined and
better services are provided through regular classroom teaching to see the extent to which they overcome these problems. If the child fails to improve, he/she is diagnosed as learning disabled and sent for more specialized intervention. However, the regulations prevalent in a given State or Regional authority becomes binding in determining the school practices in diagnosis.

In a multi-cultural and multilingual background country like ours, one need to be careful about the diagnosis, as we do not have standardised tests of reading, writing and arithmetic designed for assessing academic achievement at different grade levels. Hence, the assessment is largely curriculum-based. While doing such assessment, the influence of age of enrollment in school, instructional environment at school and support in home-setting are required to be carefully examined. Under the circumstances where it is difficult to ascertain these, it is more appropriate to use the term ‘learning difficulties’ or ‘underachievement’ in reading, writing and arithmetic instead of ‘learning disabilities’.

The term ‘developmental dyslexia’ is also used interchangeably with ‘learning disabilities’ particularly in children. Developmental dyslexia is considered as a disorder in children, who despite of adequate classroom instruction, fail to attain language skills of reading, writing and spelling commensurate with their intellectual abilities. Apart from reading disability, the definition also includes spelling and writing as well under the broad definition of dyslexia. Dyslexia is primarily a specific language based disorder of constitutional origin characterised by difficulties in single word decoding that usually reflects insufficient phonological processing abilities. These definitions attempt to differentiate between poor academic performance that is expected due to the level of intelligence and sensory capability and poor performance that is unexpected that is due to unknown reasons leading to learning disabilities.

### 2.3 Differential Diagnosis

As we discussed above learning disability should not be due to perceptual problems resulting primarily from impairments in vision, hearing or motor disabilities, emotional disorders, mental retardation, global developmental delay, nor should it be due to environmental factors such as deprivation, abuse, inappropriate or inadequate instruction, and lack of motivation, cultural or economic disadvantage or linguistic diversity. One should also distinguish it from any other co-existing condition such as Developmental Coordination Disorder, Attention Deficit Hyperactivity Disorder or anxiety. The trained clinician, psychologist, special educator or speech pathologist and audiologist should exclude these possibilities to reach at a pure form of learning disability. When it is difficult to exclude these conditions, the case may be diagnosed as ‘learning difficulty’ instead of ‘specific learning disability’.

### 2.4 Classification

There are several classification systems available for classifying specific learning disabilities. Out of which, one of the most widely used one is: (1) International Classification of Diseases (ICD-10, WHO, 1994) describes learning disabilities as ‘specific developmental disorders of scholastic skills (SDDSS)’, in which the normal patterns of skill acquisition are disturbed from the early stage of development, not as a consequence of lack of opportunity to learn or due to any form of acquired brain trauma or disease. It includes the following categories of specific scholastic disorders (1) Specific reading disorder, (2) Specific spelling disorder, (3) Specific disorder of arithmetical skills, (4) Mixed disorder of scholastic skills, (5) Other developmental disorders of scholastic skills. While diagnosing such cases one should see that the subject
Developmental Disorders has an academic performance score in the given area which is at least two standard errors of prediction below the level; expected on the basis of the child’s age; and general intelligence assessed by using an individual test of intelligence designed for the culture as well as educational system.

Here, we will discuss three main specific learning disabilities relating to reading, writing and mathematics.

2.4.1 Specific Reading Disability

This disorder is diagnosed when an individual has specific and significant impairment in development of reading skills which is not due to poor intellectual functioning, visual or auditory acuity or poor schooling. It includes reading skills like reading comprehension, word recognition, oral reading skills and even impairment in skills that require reading. Most of them have history of specific developmental delays in speech and language acquisition. At the early stage, difficulties are observed mostly in learning an alphabetic script, in reciting the alphabet, in naming letters, rhyming words, in analysis or categorization of sounds. At a later stage reading disorders may be manifested in omission, substitution, distortion or addition of words, slow reading rate, hesitations, reversals of words and even sentences, inability to comprehend, or recall what was read and so on. Difficulty in reading may be seen in other scholastic areas such as arithmetic or writing.

2.4.2 Specific Writing Disability

The term ‘disorder of written expression’ was used by American Psychological Association (APA, 2000) as a synonym for specific writing disability. It is defined as “writing skills that fall substantially below those expected given the individual’s chronological age, measured intelligence and age appropriate education” (pp. 54-55). This disturbance should also significantly disturb the daily activities of the individual in order to be called a ‘disorder’. However ICD-10 (WHO, 1994) does not have a parallel term. It has a category called ‘Specific Spelling Disorder’. People with specific spelling disorder encounter significant difficulty in development of spelling skills in absence of impairment in intellectual functioning, visual or auditory acuity or poor schooling. In some cases spelling difficulties are also seen in writing problems, but all who have difficulties in writing need not have spelling problems. Poor visuo-motor coordination may also cause significant problem in handwriting. Spelling difficulties are usually assessed by using individualised tests of spelling. While diagnosing spelling difficulties in children the clinician should see that he/she does not have difficulties in reading accuracy or reading comprehension. At times poor teaching environment either in the school or home may cause spelling difficulties. Apart from intellectual functioning and age, these factors are also to be considered while identifying people with spelling disorder.

2.4.3 Specific Mathematics Disability

This is characterised by a specific impairment in basic computational skills such as addition, subtraction, and multiplication. It should not include difficulties in higher mathematical skills such as algebra, trigonometry, geometry or calculus. This should not be due to intellectual, sensory, perceptual or neurological impairment or poor teaching-learning environment (ICD-10, WHO, 1994).

These three principal forms of specific developmental disorders of scholastic skills may coexist with one another too. In that case, this may be diagnosed as mixed disorder of scholastic skills. In all these cases individualised assessment requires to be conducted in order to ascertain the diagnosis.
Self Assessment Questions 1

1) What is Specific Learning Disability? How would you identify children with specific learning disability in a community?

.....................................................................................................................
.....................................................................................................................
.....................................................................................................................
.....................................................................................................................

2) Which of the following should be excluded while diagnosing reading disability?
   a) Poor schooling
   b) Average intelligence
   c) Poor comprehension
   d) Mispronunciation

3) Indicate the category of learning disorder which is not included under ICD-10.
   a) Specific reading disorder
   b) Specific writing disorder
   c) Specific disorder of arithmetical skills
   d) Mixed disorder of scholastic skills

2.5 BRAIN AND LEARNING DISABILITY

2.5.1 Minimal Brain Damage

Many biologically oriented clinicians often view that learning disabilities are due to minimal brain damage (MBD). The brain damage is so minimal that it is not clearly detectable by neurological investigation. Although, all children with learning disability may not have identifiable brain damage, some of them may have brain pathology, which seems to have etiologic significance. Damage in many different parts of the brain may jointly affect processing of information required for academic skill acquisition leading to learning disability.

2.5.2 Mixed Brain Dominance

Generally, left side of the human brain is specialized in functions that are related to processing of verbal information, whereas the right side is specialized with processing of nonverbal information. Some investigators claim that the kind of cerebral dominance seen in people with learning disabilities is quite mixed (mixed dominance), for instance, when one is right-handed he may be left-eyed and vice versa. Many of them are ambidextrous, that is, there is an ambiguous dominance. However, in spite of claims, there is no refutable scientific evidence that this is the case in a typical child with learning disability.

2.5.3 Syndrome Analysis

Analysis of the responses obtained from comprehensive neuropsychological assessment
can provide significant information on such deficits. ‘Syndrome’ refers to a group of symptoms that consistently occur together or even in a condition characterised by a set of associated symptoms. In neuropsychology, syndrome analysis refers to systematic analysis of the range of disorders which are caused by brain damage. Investigators like Bakker (1979, 1990) developed both diagnostic procedures as well as empirically investigated intervention procedures. However, at the same time, it should also be cautioned that irresponsible labeling of the child with learning disability as brain damaged or minimal brain dysfunction (MBD) may cause unnecessary concern for the parent, as well as teachers. This kind of labeling often shifts the responsibility of evaluation and treatment from school authority to the physician (Schmitt, 1975). Neuropsychological tests that provide essential information on individuals having brain disorder may be used to localise the brain damage. There are various standardised neuropsychological tests such as Luria-Nebraska Test Battery, Halstead-Reitan Neuropsychological Test Battery to assess the extent of brain damage.

2.5.4 Neuroplasticity

A large number of researchers suggest that the left hemisphere of the brain is specialized for language processing. Hence, lesion in the brain that affects left hemisphere is more likely to be connected with learning disabilities. Training programmes that enhance the functioning of children with learning disability are in fact designed to enhance the brain plasticity. Neuroplasticity refers to the capacity of the neurons to take up the function of other neurons. It is modification of neural activity in response to changing neural stimulation, learning or remedial training. Brain of the children is much more plastic or responsive to change due to stimulation than that of the adults. Therefore, earlier is the remedial programme, better is the expected recovery of functions; particularly language functions recover much faster and better than other functions and a systematic training is better than unsystematic one (Beamount, 1983). Since, learning disability is primarily a language disorder; the recovery in response to remediation is expected to be better than other neural dysfunctions seen in children.

Self Assessment Questions 2

1) What is ‘neuroplasticity’? Explain.

....................................................................................................................
....................................................................................................................
....................................................................................................................
....................................................................................................................

2) What is the full form of MBD?

....................................................................................................................
....................................................................................................................
....................................................................................................................
....................................................................................................................

2.6 INTERVENTION

In the following section, let us see some of the methods used for intervention in case of specific learning disabilities.
2.6.1 Reading

Reading is one of the most demanding adaptive skills of the modern world, thus reading difficulties cause tremendous problem in adaptation. The remedial methods used for improving reading can be put under two groups: (1) code emphasis programme (CEP) and (2) meaning emphasis programme (MEP). The former group of programmes is focused on letter-sound regularity, whereas the latter focuses on comprehension and also called whole language method (Jena, 2013). For instance, in CEP children are taught to learn phonemically similar words first in order to understand their structure in terms of phonemes through rhyming such as Cat-Mat-Bat, whereas MEP uses decoding techniques to enhance comprehension by taking most frequently occurring words in the child’s language environment.

2.6.1.1 Developmental Approach

This approach takes the language development of the child into account. It introduces sequential set of reading activities according to the emergence of vocabulary by engaging children in motivational activities. Such programmes are particularly useful for children who are multi-culturally disadvantaged groups. The approach is largely comprehension-oriented.

2.6.1.2 Direct Reading Activity Approach

In this approach, the student is motivated to prepare materials, new concepts, encouraged to ask questions. Skills are developed through drill or workbook exercises. He/she learns new words through phonic methods.

2.6.1.3 Linguistic Approach

Linguistic approach is a whole word approach as words are taught in the context of word families or only as whole. The emphasis is placed on phone-morpheme relationship. Reading is taught by association with child’s natural language proceeding from regular spelling to irregular ones, so that an awareness of structures develop. However, its major limitation is that there is little emphasis on comprehension, the vocabulary is extremely controlled, and distraction is caused by use of nonsense words to teach their basic structures and pattern practice.

2.6.1.4 Gillingham Method

This is a highly structured and phonetically-oriented method (Gillinham, & Stillman, 1940) in which the teacher uses phonetic cards having names of alphabets written on them. Each letter sound is taught by using multisensory method. The cards are exposed to the student and the name of the letter is read by the teacher. This is then repeated by the student. After mastery of the name of the letter, the teacher makes sound of this letter, and asks the student to repeat the same. Then the teacher exposes the phonetic card and asks the student: “What does this card say?” expecting the student to produce the corresponding sound (phoneme). In the next step, without exposing the card, the teacher utters the sound (phoneme) and asks the student to name the letter that represents the sound. Then, the letter is written by the teacher, explaining its form. The student traces it, copies and writes from memory.

2.6.1.5 Language Experience Approach

Language experience approach attempts to integrate reading with speaking, listening and writing skills. Its focus is on the following three basic assumptions: (a) What the child thinks about, can talk about, (2) What the child can say, can write and (3) What
a child can write, can read. Precisely, thinking, talking, listening, reading and writing are considered a part of a whole integrated activity. Thus the reading materials are selected according to the learner’s interest.

2.6.1.6 Multisensory Method

This is also known as Fernald method, as it was originally proposed by Fernald (1943). In this method, the child is first asked to write the word correctly, and then read it and thereafter to move on to extensive reading material which is not his own. The stages to introduce these methods are as follows: (1) teacher asks the student to find out the words which are difficult to learn, writes the word with crayon and asks the student to trace it out while speaking it aloud. He/she is asked to make stories using the word. (2) The child himself/herself writes the word, looking at the teacher’s writing and may begin reading from books. (3) Children recognise new words and learn about their similarities to the older one, and expand their reading skills.

2.6.1.7 Programmed Reading

This is a self-teaching and self-correction approach. Instructional materials are prepared in such a manner that the learner gets a feedback by answering the questions provided at the end of the text and the answers in the next page or in the same page in reverse manner, so that he can turn it to read and self-check. In advanced computerized programmes, automatic evaluation reports, audio and video feedbacks are also made available for the learner.

2.6.1.8 Cognitive Behavioural Method

Like any other activities that require planning and execution of the strategy, reading also involves proper planning and its implementation which are close to thinking. Thus reading is seen essentially as a thinking activity. In view of this children are taught how to prepare the strategy by analysing their own thinking such as (a) ‘What do you think’ and (b) ‘Why do you think’ strategies’, (c) ‘Can you prove it?’ strategies. Cloze tests are also used to assess their understanding of the text. In cloze test words are removed from the sentences at regular intervals and the child is asked to fill in the blanks to read the text. One who comprehends the text well is expected to perform better than one who has difficulty in comprehension. A six step cognitive behaviour therapy procedure was used effectively by Jena (2013) for treatment of children with learning disability, which included (1) Task description, (2) Formulation of strategy, (3) Modeling, (4) Guided practice, (5) Verbalisation, and (6) Self monitoring.

2.6.1.9 PASS Method

Das, Naglieri & Kirby (1994) proposed that the cognitive processes that are involved in intellectual performance including reading can be better understood through PASS (i.e. Planning, Attention, Simultaneous, Successive) Model, where Planning is explained as a mental process that provides cognitive control. It involves strategies and plans, self-monitoring, self-regulation, utilisation of processes and knowledge to achieve a desired goal. Attention refers to the individual’s focus on cognitive activities including resistance to distraction and selective attention over time; whereas, Simultaneous processing means meaningful organisation of many bits of information at the same time and to arrange those data into interrelated groups. Successive processing refers to ordering of the information in specific manner. In fact PASS model is an alternative theory of cognitive processing, used extensively for teaching cognitive skills to children with learning disabilities and mental retardation.
There are many other methods of instruction. Combinations of the above mentioned techniques and approaches can help in improving reading skills of people with reading disability.

### Self Assessment Questions 3

1) Mark (✓) whether the following statement is true or false.
   a) Attention, Simultaneous and Successive are the component of PASS model
      (True/False)

2) What is cloze test?
   .....................................................................................................................
   .....................................................................................................................
   .....................................................................................................................
   .....................................................................................................................

### 2.6.2 Writing

For developing writing skills what is required most is to design effective writing instruction which is tailored to the need of the learner, identifying the roadblocks while analysing their writing and then devising technology for reducing these errors. In this section you will know some of the most popular methods of writing instruction.

#### 2.6.2.1 Developing Basic Readiness Skills

*Manuscript Writing*: For developing basic readiness skills for writing, the therapists and teachers focus on handwriting first. It requires fine perceptuo-motor co-ordination and control, skill of discrimination of shape, size and position of the letters. Hence, they are first made to learn drawing basic geometrical forms such as straight lines (vertical, horizontal, slants, symmetrical), curves, circles, triangles or rectangles which are required for the basic structure of the alphabets. Children are also taught cursive handwriting.

*Transitional Writing*: By the time children are in second or third grade, they are taught cursive writing, although cursive writing is difficult for children with writing disability and recently their usefulness have been questioned. Apart from cursive writing, transitional writing also involves transforming letters into pictures, finger painting, cutting with scissors, tracing and drawing of pictures, alphabets, chalk board activities, free movement and so on. The activities not only enhance perceptuo-motor skills but also motivation of the learner. At the beginning of the second grade, spelling skills are emphasised by involving various activities. Spelling skills are particularly difficult to acquire for many children learning English language because it does not follow a single rule. Therefore, multiple examples and demonstrations are used.

#### 2.6.2.2 Cognitive-Behavioural Strategies

For composition writing the learner requires not only the knowledge of spelling, or syntax but also planning and host of other higher levels of cognitive competence such as goal-directedness, hierarchical organisation of materials, planning of sentences, revision of text, self-monitoring of errors and so on. In order to teach these skills cognitive-behavioural approaches have been used effectively. A majority of strategy instruction programmes have used steps such as (1) Identifying Objectives, (2) Drafting (3) Revision and Editing and (3) Developing appropriate attitude for writing.
speed through time management is also incorporated as an additional method of training. The best writer is considered as one who completes a writing assignment in time. Therefore, at each stage, setting timeline is important for teaching writing skills. The cognitive strategy training may also involve things like memory training. This may be taken as distinct method of training writing skills.

### 2.6.2.3 Mnemonic Method

In this method, students are asked to prepare long text (e.g., stories) and asked to evaluate their writing-in-progress (Reid, & Lienemann, 2006). This method is designed to enhance memory for the content and sequence of writing expository text, for instance writing a story. They are taught simple mnemonic device to regulate the process of writing. For instance the mnemonic device like ‘WWWH’ letters may stand for ‘Who’ (Who are the characters), ‘Where’ (the setting in which the story began or took place), ‘When’ (When the story occurred) and ‘How’. (How the story concludes). This kind of strategies can be taught and developed through demonstration, group discussion and practice. Teachers can prepare similar checklists for students to remember the steps better for specific composition writing.

### 2.6.2.4 Computer-Assisted Writing Instruction (CAWI)

Computer-assisted writing instruction programmes have made significant impact on the remedial programme for the writing disabled children and adults. Kantrov (1991) points out that the most obvious benefit, of CAWI, is the elimination of the need to recopy successive drafts (Kantrov, 1991). Use of word processing feature in computers can reduce amounts of difficulties such children encounter in correct the spelling of words. Many of these applications, including text-voicing has immense potential to listen to the text digitized by the learner. Computers are now programmed to provide performance feedback about writing. Writing software teaches the writing process without being fatigued like a human trainer. A wide range of computer assisted programmes are now available for mastering writing skills. However, there are also limitations of this method.

### 2.6.2.5 Test-Study-Test Technique

In this method, the student is provided a reading or writing exercise to assess the baseline learning competence and a list of words misread or incorrectly written is prepared and then he/she is exposed to remedial teaching. Subsequently a second assessment is done and the progress is charted out to indicate the difference. This process continues till the student reaches a criterion level of competence. Instead of considering this as a method, this may be seen as a paradigm for assessing effectiveness of any writing intervention programme.

### 2.6.3 Mathematics

A large number of skills are required for acquisition of mathematical concepts such as grouping, mental operations like conservation, counting by matching of numerals, one-to-one correspondence or manipulation of objects, memorization, abstract thinking and so on. Some people perform poorly in mathematical tests only because of poor time management or lack of meta-cognitive skills to check one’s own performance. Therefore, it is necessary to examine carefully about the areas and extents of deficits in the individual. This can be assessed by using standardised as well as curriculum-based tests and by interviewing students as well as teachers. For teaching arithmetical skills to the people with mathematical disability, individualised programme are more effective than those which are conducted in group setting. What is most important to know is the learner’s cognitive development. Some such programmes have been discussed in the following sections:
2.6.3.1 Cognitive-Behavioural Approach

Cognitive-behavioural approach to training focuses on improving mathematical problem-solving skills by enhancing the intermediate executive processes such as (1) Translating, (2) Integrating, (3) Planning and Monitoring, and (4) Executing (Mayer, 2004). Translating refers to translate the relational text to relational statements that is, converting a problem statement into specific mental representations and operations such as addition, subtraction, multiplication or division. Precisely, a text or word problem is transformed into required mathematical operations. Even translating relational sentences into tables, graphs and equations may enhance the learner’s capacity to improve his problem solving skills. At the next stage, that is, Integrating, the learner integrates these mental representations of the situations as a whole. It requires assimilation of relevant information from the problem statement, their coherent organisation and then drawing inferences from them for problem solving. Planning and monitoring is the stage at which the learner selects a strategy to attack the problem such as finding similar example of problem solving, remembering similar problem-solving situations, restarting the problem-solving process or making sub-goals to solve the index problem. Executing, which is the last stage of mathematical problem-solving in this model, involves carrying out a solution procedure. It requires procedural knowledge such as addition, subtraction, multiplication, division and other higher mathematical operations.

2.6.3.2 PASS Method

Mathematical problem-solving requires systematic strategy planning which can be taught by Cognitive Strategy Instruction (CSI). Children who perform poorly in mathematics are often deficient in both knowledge of mathematical facts as well as in other problem-solving skills. Hence, their planning skills need to be enhanced. PASS (Das, Niglieri & Kirby, 1994) is one such model, for enhancing problem-solving skills. Although used primarily for teaching reading skills to children, this can be used for mathematical problem-solving skills (Naglieri & Johnson, 2000). In this programme the poor learners are provided with a math worksheet to fill in and then they are engaged in self-reflection and verbalisation of strategies regarding filling of the work sheet. Regular drills, control of disruptive behaviour, increasing ‘Engaged time (ET), i.e., the period in which a child is being actively occupied with ideas or educational materials can enhance the effectiveness.

Apart from these, there are general approaches to intervention in learning disability which are focused on overall enhancement of information processing skills of the learner, such as ‘Balance Model’ which attempt to reduce the hemispheric differences in the acquisition and use of descriptive systems in learning disabled people, by reducing information load on the affected hemisphere and changing the modalities of presentation so that the active hemisphere can be engaged in processing of information (Shywitz, et al., 2004; Robertson, 2000). Similarly monitoring of electrical activity of the brain through EEG biofeedback training has been suggested to improve information processing skills of children with learning disabilities (Lubar, 1985; Lubar, 1999; Tansey, 1991).

Self Assessment Questions 4

1) Which of the following is not a component in cognitive-behavioural intervention in mathematics?
   a) Translating
   b) Integrating
   c) Text-voicing
   d) Executing
Developmental Disorders

2) What does WWWH refer to?

.................................................................................................................................
.................................................................................................................................
.................................................................................................................................
.................................................................................................................................

3) Mark (√) whether the following statement is true or false.

   a) Mnemonic Method of instruction is based on attentional process.

   (True/False)

2.7 LET US SUM UP

In this Unit you learned that specific learning disability is a developmental disorder which becomes conspicuous when children go to school. In spite of their average or even above average intelligence and adequate schooling these children lag behind in their academic skills. These children have fundamental difficulties in monitoring of basic psychological processes, such as attention, perception, memory, logical thinking and so on. However, before giving a diagnostic labeling one must exclude the possibility of other developmental disorders such as mental retardation, perceptual problems resulting primarily from impairments in vision, hearing or motor disabilities, emotional disorders, mental retardation, global developmental delay; nor should it be due to environmental factors such as deprivation, abuse, or poor schooling, lack of motivation, cultural or economic disadvantage and linguistic diversity.

You also learned that learning disability is generally classified into the following three groups: Specific Reading Disability, Specific Writing Disability, and Specific Mathematical Disability. The causes of learning disability are not clearly known. Many investigators associate it with minimal brain damage (MBD). In many cases children with learning disability have mixed brain dominance. As a result of this, the child may have brain functions that are localised diffusely in different parts of the hemispheres; because of this the child experiences tremendous difficulty in organising the information while processing them. Learning disability is only one such manifestations. The Unit also described several methods of psychological intervention in learning disability. However, these methods may be placed under two broad categories: (1) code emphasis and (2) meaning emphasis programmes. The selection of an effective intervention programme is determined by the pattern of deficits exhibited by the individual child. Very often more than one approach is used for intervention and we assume that individually tailored intervention programmes are better than the ones which are designed for group setting.

2.8 ANSWERS TO SELF ASSESSMENT QUESTIONS

Self Assessment Questions 1

1) Specific learning disability includes those skill deficits which are confined to scholastic performance in subjects like reading, writing and arithmetic even though having average or above average intelligence.

   Identification of specific learning disability should consider the following. It should not be due to perceptual problems resulting primarily from impairments in vision,
hearing or motor disabilities, emotional disorders, mental retardation, global developmental delay, nor should it be due to environmental factors such as deprivation, abuse, inappropriate or inadequate instruction, and lack of motivation, cultural or economic disadvantage or linguistic diversity. One should also distinguish it from any other co-existing condition such as Developmental Coordination Disorder, Attention Deficit Hyperactivity Disorder or anxiety.

2) a) poor schooling
3) b) specific writing disorder

Self Assessment Questions 2

1) Neuroplasticity refers to the capacity of the neurons to take up the function of other neurons. It is modification of neural activity in response to changing neural stimulation, learning or remedial training.

2) Minimal Brain Damage

Self Assessment Questions 3

1) a) True
2) In cloze test words are removed from the sentences at regular intervals and the child is asked to fill in the blanks to read the text.

Self Assessment Questions 4

1) c) Text-voicing
2) WWWH” refers to Who, Where, When and How.
3) a) False

2.9 UNIT END QUESTIONS

1) Describe the main characteristics of writing disability.
2) Describe the characteristics of Specific Reading Disability.
3) Describe any two different approaches used for intervention in reading disability.
4) Explain the techniques for improving basic readiness skills for writing.
5) What is PASS model? Explain.
6) Describe the cognitive behavioural approach to improve mathematical problem solving.

2.10 REFERENCES


### 2.11 SUGGESTED READINGS