LEARNING DISABILITIES: EFFECTIVE INTERVENTIONS

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Abstract:

The paper discusses the characteristics and areas of strengths and weaknesses among individuals with learning disabilities. It mainly focuses on different evidence based intervention strategies usually adopted at preschool, elementary and secondary levels. The principles and strategies involved in behavioral, cognitive and personal-social approaches are discussed in detail. A brief account of different techniques fall under all these approaches is given.

The Definition of Learning Disabilities

There are many definitions of Learning Disabilities. They are modified only slightly over the years. It was reformatted into the following three sections in IDEA (2004):

- IN GENERAL: The term "specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in an

imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations.

- DISORDERS INCLUDED: Such term includes such conditions as perceptual disabilities, brain injury; minimal brain dysfunction, dyslexia, and developmental aphasia.

- DISORDERS NOT INCLUDED: Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (IDEA 2004).

In order to identify the students with LD a set of exclusionary and inclusionary criteria based on the definitions will be used (Ramaa, 1993). In order to prevent the negative consequences of academic failure among the students, especially at preschool and elementary school level, the use of a discrepancy model was replaced by the model referred to as the **responsiveness-to-intervention (RTI) model.** IDEA describes this approach "as a process that determines if a child responds to scientific, research-based intervention as a part of the evaluation procedures." The model is based on the assumption that a student without disabilities will make satisfactory progress when given intensive, well-designed instruction (National Joint Committee on Learning Disabilities, 2005).

Characteristics of Students with Learning Disabilities

Learning disabilities are primarily described as deficits in academic achievement (reading, writing, and mathematics) and/or language (listening or speaking). However, children with learning disabilities may have significant problems in other areas, such as social interactions and emotional maturity; attention and hyperactivity, memory, cognition, metacognition, motor skills, and perceptual abilities. . They may need more support in these areas than they report that they need. Since LD are presumed to be a central nervous system dysfunction, characteristics may be manifested throughout the life span, preschool through adult.

Students with LD are a heterogeneous group. An understanding of the characteristics of children with learning problems is important in developing

prereferral interventions, in making appropriate referrals, and in identifying effective accommodations, modifications, and intervention strategies. Figure-1 displays the possible strengths and weaknesses of children with learning disabilities.

Fig -1: Areas of possible strengths and deficits of students with learning disabilities [Smith, 2008]
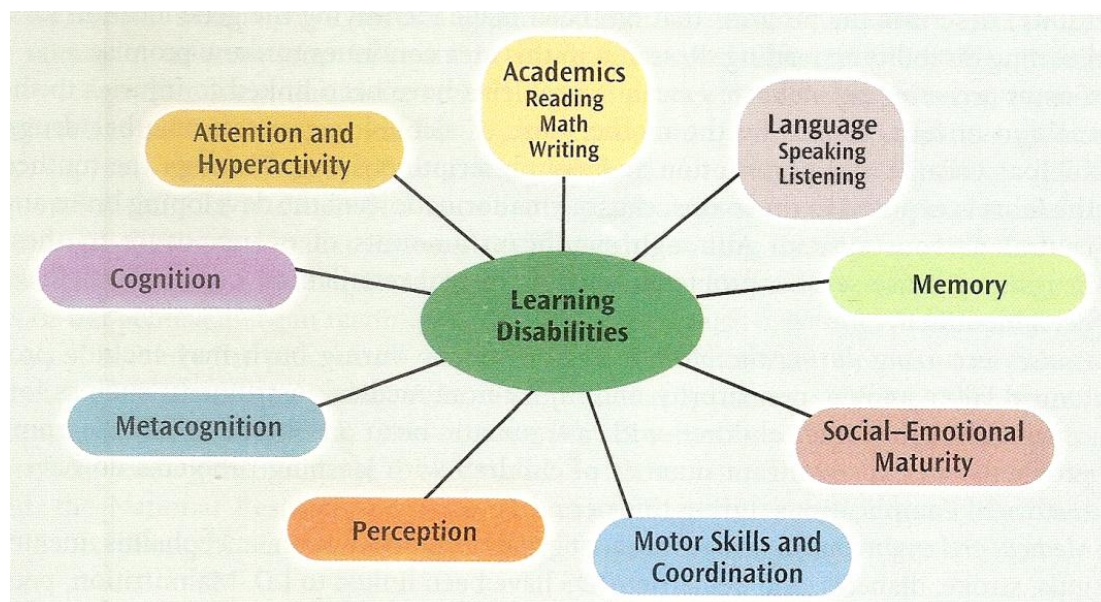
The academic problems that identify a learning disability fall into the areas of reading, math, written expression and pragmatics. Social skills deficits of children with LD include resolving conflict, managing frustrations, initiating or joining a conversation or play activities, listening, demonstrating empathy, maintaining a friendship, and working in groups. Because of behavior and language differences, children with LD need more guidance and structure. Over time, this need can create feelings of over-dependency, and eventually "learned helplessness" can occur.

Approximately 51 percent of students with LD are also reported to have attention problems, and it is estimated that 3.7 percent of school-aged children have both LD and ADHD (Smith & Adams, 2006). The comorbid occurrence of

these two disabilities has also been found to create an increase in the need for special education service.

Students with LD have deficits in short-term memory, working memory, and long-term memory. Ramaa (1990, 2014) observed that children with LD exhibit significant deficiency in auditory sequential memory. The memory skills are inconsistent in children with LD. When children with learning disabilities are taught memory strategies, they make substantial gains at all grade levels (Scruggs &. Mastropieri, 2000).

Cognition refers to the ability to reason or think. Students with problems in this area may make poor decisions or frequent errors. They may have trouble getting started on a task, have delayed verbal responses, require more supervision, or have trouble adjusting to change. Understanding social expectations may be difficult for them. They may require concrete demonstrations. They often have trouble using previously learned information in a new situation. Ramaa (1990, 2014) noticed that children with mathematically disabled exhibited delay/deficit in Piagetian tasks of cognitive development, more specifically in seriation, classification and conservation tasks.

Metacognition is referred to as "thinking about thinking". Students with problems in this area might have difficulty focusing on listening, purposefully remembering important information, connecting that information to prior knowledge, making sense out of the new information, and using what they know to solve a problem. They often lack strategies for planning and organizing, setting priorities, and predicting and solving problems. An important component of metacognition is the ability to evaluate one's own behavior and behave differently when identifying inappropriate behavior or mistakes.

Perceptual disorders affect the ability to recognize stimuli being received through sight, hearing, or touch, and to discriminate between and interpret the sensations appropriately. A child with a learning disability might not have any problems in these areas, or he or she might have deficits in any or all of them. Identification of deficits and training in the perceptual processes or reference to a child's "learning style" was emphasized in the early 1970s; however, it is no longer a prominent consideration in the education of children with LD.

Motor Skill and Coordination Problems has also been de-emphasized in the identification of an intervention for children with learning disabilities because it is not directly related to academics. However, it is common for children with LD to display problems in gross motor areas.

Intervention Strategies for Students with Learning Disabilities

Treatment procedures for individuals with learning disabilities have been controversial over the years.

The way in which children with learning difficulties are helped stems from the particular definition and understanding of learning difficulties that is applied by a school authority. During the 1960s and 1970s, the use of perceptual-motor and psycholinguistic approaches were popular. These approaches comprised activities involving visual discrimination, auditory sequencing, visual-motor, and cross-modality training tasks (such as eye-hand coordination).

The effectiveness of programs for training psychological processes (such as visual perception) was questioned many years ago by numerous authors , while others pointed to the lack of success of ability training approaches in improving academic achievement .

This triggered a move toward a skills approach, in which direct instruction was implemented in the areas of academic deficit. More recently, language, social-emotional, and cognitive-metacognitive areas have received positive attention. Many approaches have gained acceptance as research-based methods for improving the skills and developing the abilities of children and adults with learning disabilities.

The following section discusses the evidence-based approaches for each age level.

Evidence-Based Approaches

In a review of various treatment approaches, Elksnin and colleagues (2001) conclude that no single approach to learning disabilities can be cited as the best. They suggest that each model has a "partial view of the truth" and "each individually is too narrow to be useful for all students". The following approaches are time-tested and research-based. They can be implemented in a general education classroom and may benefit many nondisabled students as well. The

strategies are discussed according to age levels-preschool, elementary; secondary; and adult. The largest section concerns the elementary school student; however, many elementary-level techniques are equally effective at the secondary level.

Approaches at Preschool Level

In addition to the controversy surrounding assessment and identification of learning disabilities in preschool children, much has been written for and against the educational effectiveness and cost-effectiveness of early intervention programs for these children.

Smith, (2008) provides an overview of the curriculum models primarily used in preschool programs for children with LD. These include developmental, cognitive, and behavioral models.

The **developmental model** stresses provision of an enriched environment. The child is provided numerous experiences and opportunities for learning. Development is stimulated through language and storytelling, field trips, and creative opportunities. These activities are particularly effective with diverse learners .

The **cognitive model (or constructionist model)** is based on Piaget's work. Stimulating the child's cognitive or thinking abilities is the primary focus. Activities are designed to improve memory, discrimination, language, concept formation, self-evaluation, problem solving, and comprehension. This new area of research is experiencing great success.

Behavioural approaches to skill development

Concepts learned by direct instruction and the theory of reinforcement form the basis for the **behavioral model**. Models of intervention focusing on direct assessment and remediation of academic or affective behaviours involve the use of applied behaviour analysis. In order to ascertain what should be taught, behaviours or skills are analysed into their component sequential steps and mastery of all steps is required. Instruction begins at the lowest level of the skill not mastered, and may involve behaviour modification or prescribed, systematic teaching techniques.

Remediation using behaviour modification involves structuring the environment including the classroom and teacher behaviour (e.g., arrangement of

furniture, teacher directions), curricula, and pupil activities before starting an academic task.

Precision teaching is one commonly used instructional system comprising the following components:

- the definition of the behaviour to be taught (pinpointing);
- observation of the child and charting of behaviour (count and chart), using this information to create aims and objectives;
- implementation of a teaching procedure (usually based upon behavioural procedures); and
- evaluation of progress.

Lovitt and Fantasia (1983) found precision teaching to be effective for primary children with learning difficulties in reading, although it may be difficult to identify appropriate objectives within current holistic approaches to the teaching of reading.

Direct Instruction is another behavioural approach which has a strong academic focus, is usually teacher-directed, and involves carefully sequenced steps. The teacher guides and monitors pupil progress regularly using behaviour analysis and learning theory techniques.

Teaching as student-teacher interactions follows behavioural approach. Instructional programs that follow a behaviourist position typically prescribe the teacher behaviour, the nature and structure of the task, and the expected response from the child.

Since children at this age are more likely to be falsely identified as learning disabled because of a maturational lag or lack of educational opportunities, it is particularly important to teach them in inclusive settings if at all possible.

Approaches at Elementary Level:

The intervention begun during elementary school years may be equally important at the secondary level and for some adults. Intervention is important in academic and language deficits, social-emotional problems, and cognitive and metacognitive deficits.

Research has shown a dramatic reduction in reading failure when comprehensive, explicit instructions are provided in phonemic awareness, a

structured sequential phonics program for decoding and fluent word recognition, processing text to construct meaning, vocabulary, spelling, and writing. A small number of children will need an intense small-group or one-on-one format.

Incorporating writing to strengthen comprehension skills and using text to reinforce the phonic skill being taught through direct instruction will be effective.

Cognitive Approaches

Cognitive approaches facilitate success for Students with learning disabilities. Teaching a strategy to apply during the process of learning new information or skills helps these students great extent. A strategy is defined by Lenz, Deshler, and Kissam (2004) as an individual's approach to a task. Teaching a strategy provides a specific set of steps for thinking strategically, including how to approach difficult and new tasks, guide actions and thoughts, and finish tasks successfully and in a timely manner. Students with learning disabilities may not automatically develop strategies for learning, or the ones they develop may be inefficient.

Metacognition and strategy instruction

Metacognition and strategy training approaches focus on the student's understanding of learning problems in terms of the thinking skills which lead to success. When the concepts of metacognitive knowledge and control are applied to academic tasks, attention is given to the knowledge and use of strategic routines in skill learning.

The purpose of metacognitive instruction in association with the teaching of academic skills is twofold. Intervention is directed at:

- enhancing pupils' meta cognitive knowledge about learning-improving the knowledge base and making them aware of the factors that influence their learning; and

- teaching the strategies that will allow students to monitor and coordinate their learning more effectively. This implies not only making them comfortable with using the strategies, but also being able to know when, where, and why to use them.

The ability to transfer the strategies to similar problems and to generalise them to a new situation is also important.

Reciprocal teaching

Reciprocal teaching is designed to improve students' reading performance, particularly in the areas of comprehension and comprehension monitoring. It consists of a dialogue between the teacher and the student and focuses on four meta cognitive strategies that will help extract meaning from the text. These strategies are predicting, questioning, summarising, and clarifying.

Initially the teacher guides and directs the use of the strategies with the students playing a relatively passive role. But gradually the teacher passes over more responsibility to the students.

Self-instructional training

Another strategy-oriented approach using controlled learning through strategy application is Cognitive Behaviour Modification. Fundamental to this approach is the use of a self-instructional technique that encourages students to monitor their behaviour consciously. The principle underlying the approach is self-guidance. In other words, statements (internally said to yourself) bring about changes in behaviour. The teacher employs modelling and fading during training.

Teaching information processing skills:

In recent years that has been a major emphasis on constructivism in most areas of the curriculum. A constructivists stress the crucial relationship between new experiences and what is already known. A balanced view of learning, however, requires consideration of the message of information processing research-that high-level thinking will be impeded if working memory is occupied with lower level tasks which have not become automatic. Quite early in the cognitive revolution, evidence was emerging that automatic information processing was a key to the attainment of high level cognitive proficiency. At the earliest stage of literacy acquisition, the challenge of fluency has to be balanced with reasonable fidelity to the text so that students gain meaning (Bussis, Chittenden, Amarel, & Klausner, 1985).

In the past, some special educators adopted a different approach to teaching and learning which went under various labels, such as Direct Instruction or precision teaching. There is overwhelming evidence that application of behaviour

analysis to teaching can produce learning of discrete behaviours or skills.

However, many students need assistance in gaining fluency. Johnson and Layng (1992) consider that **generative instruction** can build fluency and, with it, confidence and problem-solving ability. The Morningside Model of Generative Instruction can be used successfully with groups of students up to 15, and components include precision placement testing, 15 minutes of interactive instruction, and the monitoring of performance fluency against the goal of constant acceleration in rate (e.g., words per minute, additions per minute.

Personal and social approaches

Support and success is crucial for building self-concept in children with learning difficulties. Feelings of success are engendered when tasks are set at appropriate individual difficulty levels and when progress is rewarded. The use of self-correcting materials which allow work to be checked immediately also encourages success and renewed effort.

Castle (1994) provided several guidelines for creating positive learning environments for students with learning difficulties in reading. The suggestions included: promoting students' belief in the possibility of success; fostering peer acceptance; capitalising on interests; emphasising the content of teaching; and being a teacher who focuses on learning. Two major approaches have been used to promote the personal and social development of children with learning difficulties-attribution retraining and social skills training.

Attribution Retraining:

Children with learning difficulties often view their plight as a result of low ability (or other negative attributes. So a number of researchers have focused on teaching students directly to attribute their difficulties to factors which are under their control, such as insufficient effort. This is known as attribution retraining. Licht and Kistner (1986) pointed to a number of variables that determine the effectiveness of attribution training. They are as follows.

- A moderate amount of success is necessary, for students will only persist when some degree of success is experienced.
- Some failure should also be experienced if a student is to learn about persistence.

- Rather than teaching children to attribute their failures to a lack of effort, they must be taught to attribute failure to inefficient strategies or a combination of insufficient effort and ineffective strategy use. Teaching about increased effort *plus* teaching the strategies leads to success.

Social skills training:

Deficiencies in social interactions and a lack of social perception are traits observed by teachers and parents of children with learning difficulties. Children with learning difficulties may benefit from being taught directly how to interact with others. Four types of instructional procedures that can be used to assist in developing social skills were identified by Schumaker and Hazel (1984):

- description-usually these are oral techniques which describe how to perform a skill;

- modelling-the social skill is demonstrated, often using live models, role playing, video or audio-cassette tapes or pictures;

- rehearsal-verbal rehearsal of the steps involved in the skill aid memorisation and the pupils can instruct themselves what to do next;

- feedback-this indicates which steps of the skill were performed successfully and which require further improvement.

Mercer (1991) outlined four major areas that might require attention in building a repertoire of social skills. They included:

- conversation skills (e.g., greetings, active listening and asking questions);

- friendship skills (e.g., making friends, saying and accepting thanks, sharing skills);

- skills for difficult situations (e.g., saying "No," responding to teasing, apologising); and

- problem-solving skills (e.g., negotiation, persuasion, getting help and asking for feedback).

Approaches at Secondary Level:

Research-based strategies are available to teach secondary students who are struggling readers to read the all important multisyllable words.One strategy in which students are taught to decode these words by breaking them into smaller, more readable parts, while the teacher also introduces the new content vocabulary.

Reading instruction

At the secondary school level, authors typically have argued for the teaching of strategies for managing and studying text books, library skills, skimming, general strategy training, listening and note-taking, as well as adapting textbooks to help students get the most content from them.

The use of graphic organisers, concept maps, self-questioning, and the use of self-comparisons can also help secondary school students with learning difficulties to become more strategic readers (see e.g., van Kraayenoord, 1996).

The learning strategies model, warns that other elements also important to content learning include teaching critical vocabulary skills, building prior knowledge to connect to new information, and teaching an understanding of the structure of text.

Instruction in written expression

Suggestions for assisting children with difficulties in written expression have included daily writing, creating language experience books, using comic strips, letter writing, and using a word processor.

Mathematics instruction

Teaching involves the use of highly-structured visual, auditory, or tactile-kinaesthetic approaches with teacher modelling of language.

A number of remediation principles can be drawn from the mathematics literature (see e.g., Cumming & Elkins, 1994; Munro, 1994). In summary, they are as follows:

- Involve the child. This should occur in assessment and instructional phases. Allow students to take initiative, pose their own problems, self-select activities and use their own language to express their understanding of mathematical concepts and problems.

- Encourage students to see mathematics learning as construction. Allow the students to experiment with the ideas, make errors, ask questions, and look for patterns and rules themselves.

- Use real-life problems. If mathematics is seen as a way to solve problems in everyday situations, students will come to see mathematics as a valuable skill. Oral discussion, imagery, or using drawings and models with which students

are familiar are important ways of expressing problems and solutions.

- Teaching should involve small steps in sequence, the use of concrete materials and tying newly learned knowledge to concepts. Practice should be frequent but of short duration. Self-correcting materials and games are useful for reinforcing learning.

- Develop a positive self-image. This may mean convincing the students that they can learn mathematical ideas, reviewing past successes, discussing their feelings about mathematics, and providing successful experiences.

Strategies to enhance self esteem and overcoming social-emotional problems:

A major problem for secondary students with LD is low self-concept and social and emotional problems that often stem from years of school failure. To help ameliorate unhappiness, school environments must be structured to create successful experiences. One method involves self-determination or making students more active participants in designing their educational experiences and monitoring their own success; this can be done by teaching self-awareness and self-advocacy skills. Students should use these skills as active participants in their IEP meetings. Such participation is particularly important when a student is deciding whether to continue postsecondary education or to obtain employment after high school (Pocock et al., 2002).

While giving students more power and responsibility for determining their life outcome is very important at the secondary level, it is also important to maintain communication with parents and involve them in this process. Qayanthi et al., 1999). Parents can promote responsibility in their children by setting clear expectations and consequences in regard to school achievement.

Strategies to enhance transition skills:

High school students with LD especially need to acquire transition skills (e.g., abilities that will help students be successful after high school in employment and independent living). For students in inclusive settings, teachers can find ways to integrate transition topics into the regular curriculum.

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