



Clinical Perspective on the Science of Learning Disabilities

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Introduction

Learning disabilities, or learning disorders, are an umbrella term for a wide variety of learning problems. A learning disability is not a problem with intelligence or motivation. Kids with learning disabilities are not lazy or dumb.

Learning disabilities are neurologically based processing problems. These processing problems can interfere with learning basic skills such as reading, writing and/or math. They can also interfere with higher-level skills such as organization, time planning, abstract reasoning, long or short-term memory and attention. It is important to realize that learning disabilities can affect an individual's life beyond academics and can influence relationships with family, friends and in the workplace. A learning disability can be a life-long condition, affecting many aspects of life, including education and employment, family life, and daily routines [1]. Children with learning disabilities are far more likely than other children to be enrolled in special education and to use health care services. Despite their limitations, persons with learning disabilities can learn if given the opportunity. Academic supports and accommodations can help with the learning process, as can medical treatment disorders [2,3].

A learning disability is a neurological disorder. In simple terms, a learning disability results from a difference in the way a person's brain is "wired." Children with learning disabilities are as smart as or smarter than their peers. However, they may have difficulty reading, writing, spelling, and reasoning, recalling and/or organizing

information if left to figure things out by them or if taught in conventional ways. Boys are more likely than girls to be identified as having a learning disability. In 2013, nine percent of boys and six percent of girls, ages three to 17, had a learning disability for the school-age population, the most commonly used definition is found in the federal special education law, the Individuals with Disabilities Education Act (IDEA).

IDEA uses the term "specific learning disability (SLD)." According to IDEA, SLD is "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 the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations [4]. Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. 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."

The DSM uses the term "specific learning disorder". Revised in 2013, the current edition, DSM-5, broadens the previous definition to reflect the latest scientific understanding of the condition [5]. The diagnosis requires persistent difficulties in reading, writing, arithmetic, or mathematical reasoning skills during formal years of schooling. Symptoms may include inaccurate or slow and effortful reading, poor written expression that lacks clarity, difficulties remembering number facts, or

inaccurate mathematical reasoning. Current academic skills must be well below the average range of scores in culturally and linguistically appropriate tests of reading, writing, or mathematics. The individual's difficulties must not be better explained by developmental, neurological, and sensory (vision or hearing), or motor disorders and must significantly interfere with academic achievement, occupational performance, or activities of daily living [6]. Specific learning disorder is diagnosed through a clinical review of the individual's developmental, medical, educational, and family history, reports of test scores and teacher observations, and response to academic interventions.

Difficulty with basic reading and language skills are the most common learning disabilities. As many as 80% of students with learning disabilities have reading problems. Learning disabilities often run in families. Learning disabilities should not be confused with learning problems, which are primarily the result of visual, hearing, or motor handicaps; of intellectual disability; of emotional disturbance; or of environmental, cultural or economic disadvantages. A learning disability cannot be cured or fixed; it is a lifelong issue. With the right support and intervention, however, children with learning disabilities can succeed in school and go on to successful, often distinguished careers later in life [7]. Parents can help children with learning disabilities achieve such success by encouraging their strengths, knowing their weaknesses, understanding the educational system, working with professionals and learning about strategies for dealing with specific difficulties. A summary of the DSM-5 diagnostic criteria for specific learning disorder diagnosis.

Criteria

- Ongoing difficulties in the school-age years learning and using at least one academic skill (e.g. reading accuracy/fluency; spelling accuracy; written expression competence and fluency; mastering number facts). These difficulties have persisted and failed to improve as expected, despite the provision of targeted intervention for at least six months. This intervention should be recognized as evidence-based and ideally delivered by an experienced and qualified person.
- The difficulties experienced by the student will be assessed using standardized achievement tests* and found to be at a level significantly lower than most students of the same age. Sometimes students are identified with a learning disability even though they are performing within the average range. This is only the case when it can be shown that the student is achieving at this level due to unusually high levels of effort and ongoing support.
- The difficulties experienced by the student usually become apparent in the early years of schooling. The exception to this is where problems occur in upper-primary or secondary school once the demands on student performance increase significantly. For example, when students have to read extended pieces of complex text or write at a more sophisticated level under timed conditions.
- Specific learning disabilities will not be diagnosed if there is a more plausible explanation for the difficulties being experienced by the student. For example, if the student has: an intellectual disability; a sensory impairment; a history of chronic absenteeism; inadequate proficiency in the language of instruction; a psychosocial condition; or, not received appropriate instruction and/or intervention.
- All four criteria must be met and the level of functional impact is determined as being mild, moderate or severe. The level of functional impact relates to the degree to which the student struggles to perform in comparison with his/her peers and the amount of support required, in terms of both remediation and accommodation, to enable the student to participate effectively in all classroom activities [8].

Common learning disabilities

- Dyslexia-a language-based disability in which a person has trouble understanding written words. It may also be referred to as reading disability or reading disorder.
- Dyscalculia-a mathematical disability in which a person has a difficult time solving arithmetic problems and grasping math concepts.
- Dysgraphia-a writing disability in which a person finds it hard to form letters or write within a defined space.
- Auditory and Visual Processing Disorders-sensory disabilities in which a person has difficulty understanding language despite normal hearing and vision.
- Nonverbal Learning Disabilities-a neurological disorder which originates in the right hemisphere of the brain, causing problems with visual-spatial, intuitive, organizational, evaluative and holistic processing functions.
- Language Processing Disorder. A specific type of Auditory Processing Disorder (APD) in which there is difficulty-attaching meaning to sound groups that form words, sentences and stories. While an APD affects the interpretation of all sounds coming into the brain, a Language Processing Disorder (LPD) relates only to the processing of language. LPD can affect expressive language and/or receptive language.

- Visual Perceptual/Visual Motor Deficit A disorder that affects the understanding of information that a person sees, or the ability to draw or copy. A characteristic seen in people with learning disabilities such as Dysgraphia or Non-verbal LD, it can result in missing subtle differences in shapes or printed letters, losing place frequently, struggles with cutting, holding pencil too tightly, or poor eye/hand coordination [9,10].

Facts about learning disabilities

Simply put, children and adults with learning disabilities see, hear, and understand things differently. This can lead to trouble with learning new information and skills, and putting them to use. The most common types of learning disabilities involve problems with reading, writing, math, reasoning, listening, and speaking. People with a learning disability find it harder than others to learn, understand and communicate. They can need support with everyday things - such as shopping and travelling to new places.

A learning disability can be diagnosed at any time. A child may be diagnosed at birth or a parent or professional may notice a difference in a child's early development. Some people with a learning disability also have other physical and emotional conditions, and may receive more than one diagnosis. This could have an impact on the kind of support they and their families need in their day-to-day life. For example Autism, Asperger's, Down's syndrome and Fragile X syndrome [1].

Learning disabilities look very different from one child to another. One child may struggle with reading and spelling, while another loves books but can't understand math. Still another child may have difficulty understanding what others are saying or communicating out loud. The problems are very different, but they are all learning disorders [11].

Signs and symptoms of learning disabilities: Preschool age

- a. Problems pronouncing words
- b. Trouble finding the right word
- c. Difficulty rhyming
- d. Trouble learning the alphabet, numbers, colors, shapes, days of the week
- e. Difficulty following directions or learning routines
- f. Difficulty controlling crayons, pencils, and scissors, or coloring within the lines
- g. Trouble with buttons, zippers, snaps, learning to tie shoes

Signs and symptoms of learning disabilities: Ages 5-9

- a. Trouble learning the connection between letters and sounds
- b. Unable to blend sounds to make words

- c. Confuses basic words when reading
 - d. Slow to learn new skills
 - e. Consistently misspells words and makes frequent error
 - f. Trouble learning basic math concepts
 - g. Difficulty telling time and remembering sequences
- Signs and symptoms of learning disabilities: Ages 10-13
- a. Difficulty with reading comprehension or math skills
 - b. Trouble with open-ended test questions and word problem
 - c. Dislikes reading and writing; avoids reading aloud
 - d. Poor handwriting
 - e. Poor organizational skills (bedroom, homework, desk is messy and disorganized)
 - f. Trouble following classroom discussions and expressing thoughts aloud
 - g. Spells the same word differently in a single document

A learning disability does not affect a person's ability to know what they want to do in life and achieve it. It also does not stop a person from having strong emotions, instincts and ambitions. Learning disability does not stop someone from enjoying an active life. People with a learning disability can go to school, university, play sport, fall in love, get married, buy houses, have children and lead happy, independent family lives [1].

Most learning disabilities are present at birth, and result from the way a child's brain develops. It is also possible for a child to develop a learning disability after a brain injury or other problems that affect the brain (like epilepsy). Poor parenting, poverty or a child's lack of motivation does not cause learning disabilities (although these things can definitely affect learning) [4].

Teachers develop these plans for students who need extra support or accommodations in class. IEPs are developed for

- All students who have been formally identified by the IPRC
- Students having trouble in school, but have not been diagnosed with a learning disability. IEPs are only binding if they were developed after an IPRC. This means that IEPs developed without the IPRC process can change or be cancelled if the school's budget changes.
- IEPs can include accommodations or changes to the curriculum content if students cannot succeed at their current grade level. The main levels of school support are:
 - Regular Class with modified program: the student stays in the regular classroom, but the teacher makes changes to the school expectations for that student.
 - Regular Class with Resource Assistance (Special Education Resource Support Program): the student can

leave the regular classroom to go to a resource room where a resource teacher can give extra help.

- Special Education Learning Centre (SELC): the student spends all or part of the day in a small special education class.
- System-based programs: the student spends time in a small special education class, often at a different school [10].

In sum, it should be evident that children with LD are truly a heterogeneous group. The characteristics exhibited by one child with a learning disability may be quite different from another one with a learning disability. As a future educator, it is essential that you understand all of the possible characteristics that may be seen in these children. By knowing what to look for and being able to identify the common characteristics, you may be able to help in the identification, diagnosis, and assessment of a child with a suspected learning disability. Ultimately, depending on where a student's problems lie, understanding these characteristics or learning styles can lead to significant improvement in the academic performance, social awareness, and overall self-esteem of a child with a learning disability in your classroom.

Learning disabilities is complex PsychoNeuroSocial phenomena that has been caused by multi-factors and has many types and influence on the global personality behavior. If the goals of the science are to understand, predict and control the phenomena /event, and learning disabilities are an umbrella term for a wide variety of learning problems, we can explore this problem through implementing multi-methodologies for approaching the goals of the "science of learning disabilities".

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