

TEACHER'S ROLE FOR CHILDREN WITH LEARNING DIFFICULTIES IN MATHEMATICS

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Abstract: *The learning difficulties in mathematics means to include those students performing in the low average range. This paper is intended to stimulate discussion related to the role of mathematics teachers for children with learning difficulties in mathematics. The students with mathematical difficulties are often of average or higher intelligence and possess good in other activities except for mathematics, the brain region involved in mathematics difficulties are likely localized or modular. Students who have difficulties with mathematics can benefit significantly from lessons that include multiple models that approach a concept at different cognitive levels, using the process of Mnemonics to help students remember important facts.*

Keywords: -

Learning difficulties in mathematics, visual-spatial deficits, Process of Mnemonics

Introduction: -

Mathematics is as old as human society. Looking at the history of mathematics it is found that the fields of applications of mathematics were very narrow up to the 20th century. In the 21st century, the newer application of mathematics was explored in computers and many other areas other than science and engineering. But about 5% to 8% of school students have serious difficulty processing mathematics (Fuchs & Fuchs, 2002; Geary, 2004). Different views of mathematical learning disorders exist in cognitive science and the pedagogical and neuropsychological fields, Mathematical learning disorder (MLD) means the mathematical ability is far below expected for a person's age, intelligence, and education. Researchers and scientists in the field have different opinions on whether MLD as a diagnosis is possible to establish scientifically or not, or where it originates from in case it exists. Bearing this in mind, four key questions arise:

1. Who is called the children with learning disabilities in mathematics or MLD?
2. How many types of Learning difficulties are in mathematics?
3. What are the reasons behind the Learning disabilities in mathematics children?

4. What should be the Role of a mathematics teacher for children with a learning disability in mathematics?

Children with learning disability in mathematics or MLD:

The learning disability in mathematics means to include those children performing mathematics in the low average range or moderate range. This is a difficulty in conceptualizing numbers, number relationships, outcomes of numerical operations, and estimations. There is no single type of mathematics disability. This can vary from person to person. And, it can affect people differently at different stages of life. Two major areas of weakness can contribute to math learning disabilities:

- Visual-spatial difficulties, which result in a person having trouble processing what the eye sees
- Language processing difficulties, which result in a person having trouble processing and making sense of what the ear hears

Children with a learning disability in mathematics have difficulty:

- mastering arithmetic facts by the traditional method of teaching
- learning abstract concepts of time and direction
- acquiring spatial orientation and space organizing
- following directions that demand sequencing and rules
- following directions that demand little bit of mathematical calculations

Types of Learning difficulties in mathematics:

Lifelong learning disabilities involving mathematics are no single type of mathematics disability. It can vary from person to person. And, it can affect people differently at different stages of life. Learning disabilities in mathematics include difficulties in mastering basic number concepts, counting skills, and arithmetic operations skills as well as procedural, memory or retrieval, and visual-spatial deficits (Geary,2004). Now discuss six types of Learning disabilities in mathematics:

1. Number Concepts Difficulties
2. Counting Skills Difficulties
3. Arithmetic Operations Skills Difficulties
4. Procedural Difficulties
5. Memory or Retrieval Difficulties

6. Visual-Spatial Difficulties

Procedural, memory or retrieval, and visual-spatial deficits can occur separately, they are often interconnected. Each of these difficulties can range from mild to severe. Associating MLD there may be other disorders like (a) Reading disorder (b) Attention-deficit Hyperactivity Disorder (ADHD) (c) Nonverbal learning disability (NLD)

Reasons behind the Learning disabilities in mathematics of children:

The human brain comprehends numerals as quantities, not as words automatically and unconsciously. It is a reflex action that is deeply rooted in our brains. Brain imaging experiments and clinical case studies have convinced researchers that:

- ✓ The number symbols are hardwired in our intuitive number module in the left parietal lobe.
- ✓ Ordinary language number words are stored in Broca's area
- ✓ Number symbols from number words work in Parietal Lobe
- ✓ Number words from ordinary words works in Frontal Lobe

The parietal lobe is heavily involved with number operations; damage to this area can result in mathematics difficulties. Studies of individuals with parietal Lobe damage showed that they had serious problems with mathematical calculations as well as right-left disorientation, but no problems with oral language skills (Lemer, Dehaene, Spelke & Cohen, 2003; Suresh & Sebastian, 2000)

Individuals with visual processing weaknesses almost always display difficulties with mathematics (Zorzi, Priftis, & Umiltà, 2002). Studies indicate that this disorder is closely associated with deficits in the right parietal area, which specializes in visual-spatial tasks.

Genetic factors also seem to play a significant role. Children from families with a history of mathematical giftedness or learning disorders show common aptitudes with other family members.

Role of mathematics teacher for children with learning difficulties in mathematics:

Here is some discussion about the suggestions for a mathematics teacher for children with learning difficulties in mathematics. It should be in two phases: i) Identification Phase, and ii) Instructional Phase.

i) Identification Phase: - In the first phase the mathematics teacher should evaluate children to identify their learning difficulties in mathematics. She should evaluate professionally a student for learning difficulties in mathematics. The evaluation compares a person's expected and actual levels of skill and understanding while noting the person's specific strengths and weaknesses. The student is interviewed about a full range of mathematics-related skills and behaviors such as:

- ✓ Arithmetic skills like counting, adding, subtracting, multiplying, and dividing
- ✓ Appropriate procedural skills based on understanding patterns—knowing when to add, subtract, multiply, divide or do more advanced computations
- ✓ Organizing capacities to do objects in a logical way
- ✓ Measure—telling time, using money
- ✓ Estimate the number of quantities
- ✓ Self-check work and find alternate ways to solve problems.

Children with learning difficulties in mathematics are likely to show persistent difficulties with learning over time, making it all the more important to gather reliable data about student progress beginning as early as possible in the child's school career.

ii) Instructional Phase: - Mathematics teachers should follow more effective instructional strategies so that the achievement of the student with mathematics difficulties may be improved.

The teacher should encourage the followings:

- ✓ Systematic and explicit instruction in her classroom
- ✓ concrete pictorial abstract approach in the classroom
- ✓ Emphasis on the thinking strategies of the student in aloud
- ✓ Use Visual and graphic depictions of problems
- ✓ Structured peer-assisted learning
- ✓ Use of Mnemonics may improve student's retrieving power
- ✓ Use graph paper for students who have difficulty organizing ideas on paper.
- ✓ Counting and calculating rapidly
- ✓ Doing mental mathematics
- ✓ Learning math concepts beyond the basic mathematics facts

Conclusion: Many teachers (and parents), by their admission, lack a conceptual understanding of mathematics and are therefore not well prepared to teach mathematics effectively or convey

an appreciation of mathematics to their students. Many even admit to disliking or being anxious about mathematics, a perception easily conveyed to students. Difficulties in mathematics appear not to be linked to a specific disability, but rather, maybe the result of weaknesses in other related cognitive skill areas such as language, attention, memory, and skills related to perceiving and imagining space. The role of the mathematics teacher for children with a learning difficulty in mathematics is very challenging and vital. The teacher's role is started from the identification of the MLD children to the improvement of their achievement in mathematics through proper instructional strategies.

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