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AN ANALYSIS OF DYSCALCULIA IN RELATION TO ANXIETY, ATTITUDE TOWARDS LEARNING AND ACHIEVEMENT IN MATHEMATICS

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Abstract
The present study intends to find out the students who are having learning difficulties in Mathematics especially dyscalculia students, attitude toward Mathematics, anxiety towards Mathematics and Mathematics performance. Here the treatment was planned to give for dyscalculia students studying sixth standard. The students with symptoms of dyscalculia were identified through a diagnostic test conducted by the researcher. Based on the test scores, they were categorized as students with symptoms of dyscalculia in Mathematics. The experimental design includes one group pre-test and post-test design. The findings show that there is no significant difference between boys and girls, English medium and Tamil medium students with dyscalculia in the pre-test scores in Mathematics performance, pre-attitude and pre-anxiety scores in Mathematics. The present research indicates that motivating children by acknowledging and praising them, as well as using techniques that help them to overcome their math anxieties are proven to be effective in supporting those students.
Key Words: Dyscalculia, Learning difficulties, Mathematics, experimental study.

INTRODUCTION

Children with learning disabilities are low achievers and they are found to be unable to cope with the schoolwork. The difficulty in learning to read, write, or calculate is represented as discrepancy between the learner's achievements and his/her ability to learn. Unexpected underachievement has been attributed to intrinsic neurological factors which indicate that students with learning disabilities require specialized instruction toper form at expected levels (Kumar et al, 2009). These children are found to have different kinds of learning disabilities of varying degrees. The most common types of learning disabilities are dyslexia (disorder of reading), dysgraphia (disorder of written work) and dyscalculia(disorder of performing arithmetic calculations).Dyscalculia or arithmetic disorder is a less widely known disability, similar and potentially related to other learning disabilities like dyslexia, dysgraphia, dysphasia and dyspraxia and is seldom identified.

Dyscalculia is a learning disorder that affects a person's ability to understand number-based information and math. People who have dyscalculia struggle with numbers and math because their brains don't process math-related concepts like the brains of people without this disorder. Though, their struggles don't mean they're less smart or less capable than people who don't have dyscalculia. The symptoms of this disorder usually appear in childhood, especially when children learn how to do basic math. However, many adults have dyscalculia and don't know it.

"Dyscalculia is derivative of Greek root „dys" (difficulty) and Latin "calculia" from the root word calculus - a tiny sandstone or nugget can be used for reckoning. Fundamentally it explains a

complexity with figures which are a developmental cognitive condition, or an acquired intricacy as an outcome of brain damage. Dyscalculia refers to a range of math learning disabilities. Students with dyscalculia have difficulties in understanding what numbers mean, remembering math facts, and steps to complete math problems or may have difficulty with visual-spatial concepts used in making patterns or in geometry. Those who suffer with the disability have been known to comment that Dyscalculia causes numbers to "slip their minds," that looking at large numbers is like trying to read an unknown language or even that it is as if their Mathematics "memory banks" continually get erased after a lesson.

METHODOLOGY

IDENTIFICATION AND CATEGORISATION OF HIGH SCHOOL STUDENTS WITH DYSCALCULIA

The students with symptoms of dyscalculia were identified through a diagnostic test conducted by the researcher. Based on the test scores, they were categorized as students with symptoms of dyscalculia in Mathematics.

RESEARCH DESIGN

The pre-experimental design includes one or more than one experimental group to be observed against certain treatments. It is the simplest form of research design that follows the basic steps in experiments. The pre-experimental design does not have a comparison group. This means that while a researcher can claim that participants who received certain treatment have experienced a change, they cannot conclude that the change was caused by the treatment itself. One group pre-test, post-test design was used for the present study.

Identification of students with symptoms of dyscalculia

The data collected for identifying the high school students showing symptoms of dyscalculia, with the help of diagnostic test, were analyzed using percentages cores.

Categorization of students with symptoms of dyscalculia

The students with symptoms of dyscalculia were identified and the students were categorized into students with mild, moderate and severe symptoms of dyscalculia according to the mean and standard deviation of the dyscalculia test scores. ‘Mean ±standard deviation’ was found to categorize the identified students into three groups. Category of students with lower score was named as severe, students with middle scores were named as moderate and the higher scores were categorized as mild.

Table 1

Categorisation of students with symptoms of dyscalculia

Categories of students with symptoms of dyscalculia	Mean	SD	Number of	Percentage

			students	
Mild	2.68	0.656	31	77.5
Moderate			5	12.5
Severe			4	10

The table shows that, out of 40students who were identified with symptoms of dyscalculia 31 students were with mild, 5 students were with moderate and 4students were with severe symptoms of dyscalculia.

In this study, a diagnostic test has been conducted by the researcher to identify the students with dyscalculia. After determining the scores, students with dyscalculia were identified and they were treated as experimental group.

A pre-test was conducted with those dyscalculia students and the scores were taken as pre-test scores. After that, treatment was given to them for 30 days in the form of worksheets in selected topics from the syllabus of Class VI. After completing the treatment, a post-test has been conducted to the same students to analyse the effectiveness of the treatment given.

OBJECTIVES OF THE STUDY

1. To identify the students with dyscalculia of Class VI.
2. To find out the nature of mathematical difficulties experienced by high school students with symptoms of dyscalculia.

HYPOTHESES OF THE STUDY

1. There is no significant difference between boys and girls with dyscalculia in the pre-test scores in Mathematics performance, pre-attitude and pre-anxiety scores in Mathematics.

2. There is no significant difference between the students with dyscalculia studying in English medium and Tamil medium in the pre-test scores in Mathematics performance, pre-attitude and pre-anxiety scores in Mathematics.

FINDINGS OF THE STUDY

The findings of the study have been presented below.

1. There is no significant difference between boys and girls with dyscalculia in the pre-test scores in Mathematics performance, pre-attitude and pre-anxiety scores in Mathematics.
2. There is no significant difference between the students with dyscalculia studying in English medium and Tamil medium in the pre-test scores in Mathematics performance, pre-attitude and pre-anxiety scores in Mathematics.

CONCLUSION

Mathematical intervention strategies had an effective change among the dyscalculia students, where there anxiety towards Mathematics has been overcome and positive attitude of learning Mathematics had improves and at last there Achievement score in Mathematics is good. Which

had developed confidence to the sixth standard students to learn Mathematics? The present research indicates that motivating children by acknowledging and praising them, as well as using techniques that help them to overcome their math anxieties are proven to be effective in supporting those students. Recognizing the presence of dyscalculia and mathematical attitude early in educational settings is of paramount importance, as it allows for timely intervention and the implementation of tailored support strategies. Moreover, this study emphasizes the need for inclusive and empathetic educational practices that accommodate the diverse learning needs of all students. By addressing mathematical attitude and dyscalculia in a holistic manner, we can work towards creating more equitable and supportive learning environments, ultimately empowering students to overcome these hurdles and develop a positive relationship with learning Mathematics. Further research and collaboration between educators, researchers, and policymakers are crucial to ensuring that individuals with dyscalculia and mathematical attitude receive the comprehensive support they require to thrive academically and beyond.

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