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A STUDY OF STUDENTS WITH DYSCALCULIA AND THEIR MATHEMATICAL ABILITIES AT PRIMARY SCHOOLS IN KARAIKUDI

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Abstract

Education is considered to be a key factor for the growth and process of any society. Mathematics Education is an important component of school Education. Learning difficulties is a major contributing factor for the children in schools, which requires immediate concern. Dyscalculia refers to an incurable difficulty in learning and understanding Mathematics. Primary School students find these difficulties in learning of number concepts and basic arithmetic. The study under investigation is to find out children who are affected by dyscalculia in the schools of karaikudi. The investigator proposes to use Survey Method for this study. Population for the study is Primary school students in karaikudi. The random sampling technique was used for this study. The sample is 100 primary school students in karaikudi. The tool for the study is adopted screening tool for identifying the dyscalculic students. The study revealed 9% students of the primary school in karaikudi were found to be dyscalculia. Hence

identifying the dyscalculic students and giving them the necessary intervention programmes to improve their learning difficulties in Mathematics and it is the need of the hour.

Keywords

Dyscalculia, Mathematics, Learning Difficulties, Primary School Students

1. Introduction

Education is to be a vital role for the growth and process of any society. Education determines the level of prosperity, welfare and security of the population. When children come to the world they are unaware of these difficulties and continuous interactions with their environment they begin assimilate and accommodate more concepts and try to get adjusted with surroundings. Through education children become responsible, accountable with knowledge and behaving as good citizen of strong and powerful persons. They try to use all their capacities to develop themselves, their society and their nation to the greatest extent by contributing their innate talents. Here the students are unique in each one's own way. They differ from their talent of doing mathematical operations from their peer group. Students who are facing difficulties in learning mathematics, identifying the symbols, numbers and difficult to do calculations considered as students with dyscalculia. The aim of the study is to find out the level of such students in their performance of doing arithmetic and calculations, thus providing extra classes and strategies to improve their mathematical abilities.

2. Mathematics

“Mathematics is the mirror of the civilizations”. The history of mathematics is the story of the development of culture. A country is known for its culture and is reflected in the knowledge of mathematics it possesses. Mathematical efficiencies are basic for the children to grow and live independently in a numerate society, which has an effect on academic opportunities, job oriented areas and social and financial category [6]. Numeracy means the ability to apply mathematical concepts in various aspects of life. Its skills involve perceptive of numbers, measuring, resolving number problems, sorting out, counting correctly, watching of patterns, adding and subtracting etc [11]. Students have to be well aware of the numbers, basic operations, symbols and mathematical terms while solving the problems. That is the importance of the mathematical learning process.

3. Learning Disabilities

A disability of learning is a neurological disorder. In an ordinary way, a learning disability varied in a way a human person's brain is "wired." Students with learning disabilities are smarter than their peers. Of course such students face the difficulty in spelling, reasoning, reading, recalling, writing and sequencing information to them to figure out things in trustful habits [3].

* Symptoms of Learning Disabilities

1. While reading word problems difficulties or inabilities to capture the terms of mathematics.
2. Inaccurate or very poor in calculation.
3. Difficulties with calculations, difficulties in comprehending the magnitude or relationship of numbers which are abnormal for that age group.
4. Struggles in solving number related problems due to very poor mathematical reasoning [10].

4. Dyscalculia - Meaning

“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 [7].

* **DEFINITION** Kosc (1974) defined developmental dyscalculia as ‘a structural disorder of mathematical abilities which have its origin in genetic or innate disorder in those parts of the brain that are the anatomical – physiological substrate of the maturation of the mathematical abilities adequate to age ,without a simultaneous disorder of general mental function [2].

Dyscalculia is used for an explicit learning disability affecting mathematical terms and numbers. Students with dyscalculia face much more struggles in comprehending simple number concepts, lack an intuitive grasp of numbers, and have problems learning number facts and procedures [8].

Two Types of Dyscalculia are:

***1: Developmental dyscalculia**

Students show signs of a marked inconsistency between their developmental stage and universal cognitive ability as it pertains to Mathematics. As a basic pointer of developmental

dyscalculia students will execute below expectations with no obvious explanation (e.g. general ability, emotional state or illness) available [9].

***2: Dyscalculia** in which students are presenting a **totally inability to handle mathematical concepts** and numbers. It presents as an everlasting situation that influences the capacity to take hold of math talents in spite of appropriate teaching [9].

6. Signs and Symptoms of Dyscalculia

Dyscalculia can cause various types of math difficulties. So symptoms can be different for each one. Observing one student and taking notes to share with teachers and doctors is the exact way to lead the best strategies and supports for all wards. It tends to become more obvious as wards grow older. But symptoms are appearing at early stage of preschool [5].

*Primary School

- ❖ The student has basic struggles in arithmetic facts such as $2 + 4 = 6$, and also learning and remembering them afterwards.
- ❖ Recognizing the directions wrongly.
- ❖ Inability to categorize +, -, and other signs, and to use them appropriately.
- ❖ Many students are utilizing fingers for counting rather not using more of advanced strategies, like math.
- ❖ Struggles to recognize signs related to math, such as *greater than* and *less than*.
- ❖ Inability to grasp and remember mathematical concepts, formulae, rules and sequences.
- ❖ Difficulties in keeping of score during games [5].

7. Significance of the Study

The intension of this study is to find out the students who are finding learning difficulties in mathematics. It doesn't mean that they are slow learners; here the teachers have the greater responsibility to diagnose the exact problem, where the student is lacking, in which aspect etc., it makes the clarity between the student capacity and the knowledge, understanding in their learning gap. A teacher might suspect that students have the difficulty with ordinary numeric operations and relies on finger-counting for all four arithmetic operations, while their peers have

progressed to more efficient strategies [1]. They may know the number correctly, but they may not be able to present or write the terms correctly. If we may show the number patterns or ask them, (“7“is what number? they may tell, as English Alphabet “L“) they find it hard to remember and retain basic mathematical facts and have dilemma in figuring out their understanding and talent to solve mathematical problems. Therefore if basic mathematical skills are not mastered, students may have complexities in doing higher mathematical applications. It is the need of the hour to find out the real problems and root cause, for poor performance. So this study is important to find out the students who are with dyscalculia and to find the solutions for the problem at primary school level. Since it is a preliminary study the sample size is taken as small number.

8. Statement of the Problem

“A STUDY OF STUDENTS WITH DYSCALCULIA AND THEIR MATHEMATICAL ABILITIES AT PRIMARY SCHOOLS IN KARAIKUDI”

9. Objectives of the Study

- ❖ To find out the students with dyscalculia among primary school students.
- ❖ To find out the significant difference between male and female students with dyscalculia at primary school.

10. Hypothesis

- ❖ There is no significance of difference in the level of difficulties of mathematical abilities of students with dyscalculia at primary school.
- ❖ There is no significance of difference between male and female students with dyscalculia in their mathematical abilities at primary school.

11. Method for the Study

The investigator adopted “Survey Method “for the study.

12. Population of the Study

The population of the present study consists of primary school students in karaikudi.

13. Sample for the Study

For this study the sample consists of 100 primary school students in karaikudi.

14. Tools for the Study

In this pilot study the Investigator adopted “Screening Tool” developed by Dr. T. Nagavalli.

1. Test on numeracy,
2. Test on sequential ability,
3. Test on motor skills,
4. Test on cognition ability,
5. Test on multiple tasks.

Each dimension is consisting of 10 items

Interview schedule and Observation are also carried out [4].

15. Statistical Techniques

- ❖ Mean
- ❖ Standard Deviation
- ❖ t – test

16. Analysis of Data

Table 1: Level of Mathematical Abilities of Primary School Students

DIMENSIONS	HIGH	MODERATE	LOW
Test on Numeracy	40%	44%	16%
Test on Sequential Ability	55%	17%	28%
Test on Motor Skill	76%	–	24%
Test on cognition Ability	46%	20%	34%
Test on Multiple Task.	09%	59%	32%

Table 2: Significant Difference in the level of Mathematical Abilities of Male and Female Primary School Students with Respect to Test on Numeracy

Students	No. of Student	Mean	SD	T-Test
Male	45	8.6	1.62	0.48
Female	55	8.87	1.36	

It is inferred from the above table that the calculated value (0.48) is less than the table value. Therefore the null hypotheses accepted. Hence there is no significant difference in the level of Mathematical abilities of Male and Female primary school students with respect to Test on Numeracy.

Table 3: Significant Difference in the level of Mathematical Abilities of Male and Female Primary School Students with respect to Sequential Ability

Students	No. of Student	Mean	SD	T-Test
Male	45	7.89	2.29	0.44
Female	55	7.51	2.58	

It is inferred from the above table that the calculated value (0.44) is less than the table value. Therefore the null hypotheses accepted. Hence there is no significant difference in the level of Mathematical abilities of Male and Female primary school students with respect to Sequential Ability.

Table 4: Significant Difference in the level of Mathematical Abilities of Male and Female Primary School Students with respect to Motor Skill

Students	No. of Student	Mean	SD	T-Test
Male	45	4.67	0.79	0.18
Female	55	4.42	1.05	

It is inferred from the above table that the calculated value (0.18) is less than the table value. Therefore the null hypotheses accepted. Hence there is no significant difference in the

level of Mathematical abilities of Male and Female primary school students with respect to Motor Skill.

Table 5: *Significant Difference in the level of Mathematical Abilities of Male and Female Primary School Students with respect to test on cognition Ability*

Students	No. of Student	Mean	SD	T-Test
Male	45	7.29	2.33	0.47
Female	55	7.63	2.49	

It is inferred from the above table that the calculated value (0.47) is less than the table value. Therefore the null hypotheses accepted. Hence there is no significant difference in the level of Mathematical abilities of Male and Female primary school students with respect to Cognition Ability.

Table 6: *Significant Difference in the level of Mathematical Abilities of Male and Female Primary School Students With respect to Multiple Task*

Students	No. of Student	Mean	SD	T-Test
Male	45	7.45	1.97	0.98
Female	55	8.6	1.62	

It is inferred from the above table that the calculated value (0.98) is less than the table value. Therefore the null hypotheses accepted. Hence there is no significant difference in the level of Mathematical Abilities of Male and Female primary school students with respect to Multiple Task.

17. Discussion

There isn't much difference in the level of mathematical abilities of male and female primary school students. For this difference survey method has been conducted on five different dimensions like result of Test on Numeracy (0.48), Test on Sequential Ability (0.44), Test on Cognition ability(0.47) Test on Motor skill (0.18), Test on Multiple Task (0.98), these are the findings have come as the result. Interview and observation have been used to find out the level

of Mathematical Abilities of male and female students of primary school. Hence, 9% of the students are affected by dyscalculia symptoms. Further some of the strategies can be developed and used to bring improvement in the students of dyscalculia and in their mathematical abilities in the future. Since it is a preliminary study, the sample is being limited to within hundred samples, in the future the size of the sample can be taken larger for the research by the investigator.

18. Conclusion

This study revealed the problem of dyscalculia such as poor number concept, difficulty in understanding place value, difficulty in remembering 'basic' facts, in these aspects 9% of the students are identified as difficulty in learning arithmetic or disabilities in mathematics. Hence the investigator concludes that, they are considered as dyscalculic students. Here is the vital role for the teacher to bring out the desirable changes in their practical and educational learning process. Neurocognitive strategies can be applied to the students for their development of learning mathematical skills and abilities in the future.

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