CHALLENGES FACED BY VISUALLY IMPAIRED STUDENTS WHILE USING ABACUS VS TAYLOR FRAME

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ABSTRACT

This study examines the students with visually impaired faces unique challenges in the educational environment. Mathematics is the language of Universe. It is also the power of our reasoning, creativity, thinking and problem solving ability. It is an important part of our day to day life. Mathematical devices are established for the children with visually impaired. The children with visually impaired they can learn mathematics at the same level as the peer sighted. Learning mathematics can enhance the students at various levels of students. Students with visually impaired they can learn mathematics through mathematical devices such as Taylor frame, abacus, Braille codes, tactile materials etc.

Key Words: Visual impairment, Abacus, Taylor frame, Mathematical devices, Arithmetic calculations.

INTRODUCTION

Mathematics is a challenging subject for all the students, especially for the students with visually impaired. Because of they need some requirements specialised instruction, to meet their unique accessibility needs. Abacus is a mathematical device for students with visually impaired. It is a basic concept for doing mathematics at a primary level. Assistive technology and the devices, it can allow the students to accomplish the task. Braille is also a device for the visually impaired students for reading, writing letters of the alphabet. Taylor frame is a device for learning mathematical concept, it is one of the tool used to teach student with visually impaired to compute mathematical problems. It can be useful for the higher level mathematical computation skills such as Addition, Subtraction, Multiplications, Division, and Algebraic notations. They can also learn mathematics with real and physical objects. Through the devices and tools they can develop their reasoning power.

OBJECTIVES

- ➢ To understand the research based on the students ability.
- ➢ To develop the scientific temperament among student and teacher.
- ➢ To understand the students at various level of learning mathematics through mathematical devices.

ABACUS

Abacus is a mathematical device for the children with visually impaired. It is a basic concept for doing mathematical concept. It is also a portable device to carry everywhere. Teaching Abacus for visually impaired at primary level itself. It is an efficient tool for visually impaired children. Children who didn't get the opportunity to learn Abacus at primary level they can learn at later stage. It is in a rectangular shape with beadings. It consists of varied columns used in different parts of the countries. But we people are using 15 columns for doing basic mathematical concept. It consist of upper and lower separation with bar, it can be helpful to do calculation, and it consist of 1/3 rd below the area and 2/3 above the area. The upper column consists of one bead, it has the value of fives, tens, hundreds... the lower column consist of four beads, and it has the value of one. Students must know, the way of learning how to calculate addition, subtraction multiply and more. Student with visually impaired they feel comfortable while they accessing abacus for doing mathematical concept. But now a day's also they taught Abacus for the children in few schools.
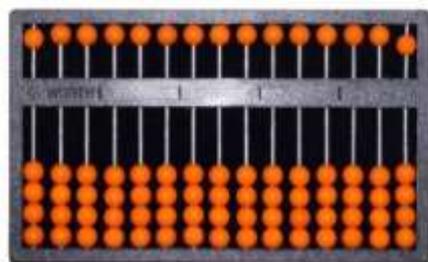
Questionnaire

1. What is the utility of learning mathematics?
2. Are they satisfied to know this?
3. Have you used abacus to carry over the numbers?
4. Does the abacus is the basic device for doing mathematical calculation?
5. Does they feel difficult to access arrange the beads?
6. Is it possible for teaching each and every concept of mathematics?
7. Does the dots in separation bar are helpful to locating the place value of numbers in abacus?

Table of content: 1

S.No	Name of the student	Student with disability	Additional disability	Age group
1	Abilesh	Blind	No	7
2	Aradhana	Low vision	No	7
3	Bhargavi	Blind	No	8
4	Hari	Blind	No	8
5	Riha	Blind	No	7
6	Sai	Blind	No	8
7	Sabari	Low vision	No	10
8	Sruthi	Low vision	No	7
9	Sugan	Low vision	No	10
10	Suganesh	Low vision	No	8

TAYLOR FRAME

It is a mathematical device, which can help the student to do mathematical concept. It has the purpose of teaching mathematical calculations such as division, multiplication, addition, subtraction and algebraic notations and more. The device consists of Aluminium and plastic material, with set of metal pegs with eight angels of pointed star. It has 0-9 mathematical signs of operations can be represented the slate consist of 32 orientations. The pegs consist of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, +, x, <,>, x, y, z, a b, c, d,), (, and decimal point.


Questionnaire

1. Are they able to find the different types of pegs?
2. Does the Taylor frame is useful for doing arithmetic calculation?
3. By using Taylor frame if they able to do algebraic calculation?
4. How do you carry over the numbers while calculating?
5. Does the Taylor frame may reduce the time consuming?

Table of content: 1

S.No	Name of the student	Addition	Subtraction
1	Abilesh	2.16	3.14
2	Aradhana	1.14	2.45
3	Bhargavi	1.12	2.56
4	Hari	2.26	3.11
5	Riha	2.08	3.58
6	Sai	2.26	3.35
7	Sabari	2.15	3.23
8	Sruthi	2.46	3.13
9	Sugan	1.12	2.07
10	Suganesh	1.36	2.33

(Time taken by minutes)

ABACUS

Figure: 1
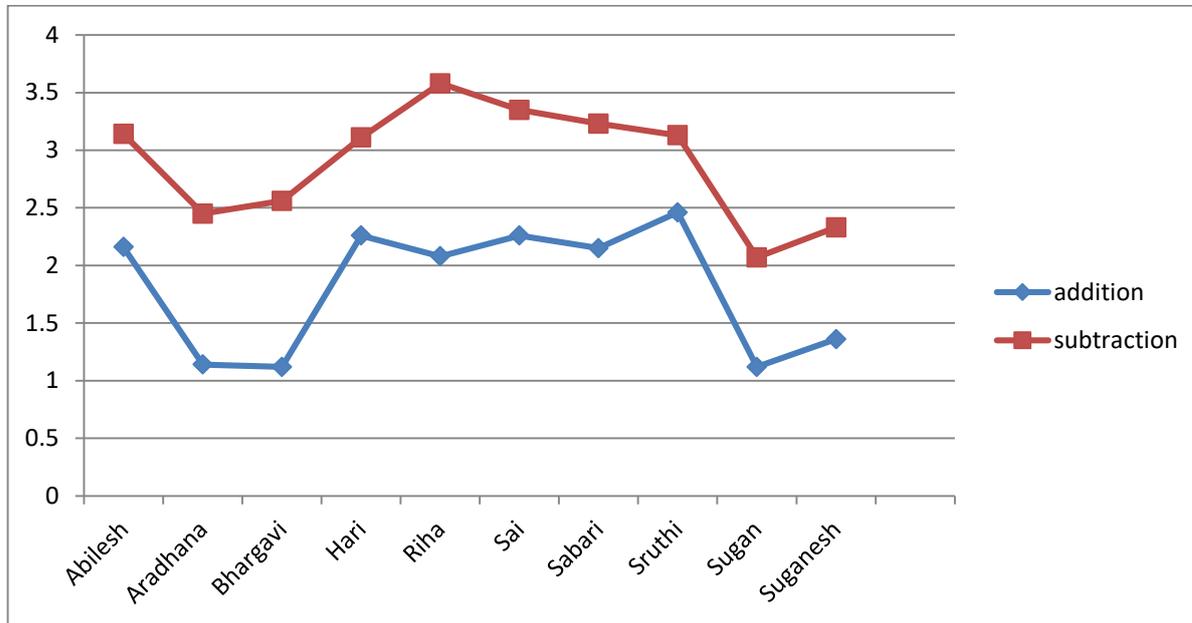
Table of content: 3

S.No	Name of the student	Addition	Subtraction	Multiplication	Division
1	Abilesh	3.24	5.07	7.45	11.43
2	Aradhana	1.53	4.07	6.56	12.56
3	Bhargavi	2.78	2.2	5.23	8.45
4	Hari	3.43	4.21	7.43	9.56
5	Riha	4.76	2.32	8.27	11.23
6	Sai	4.09	4.12	4.26	12.45
7	Sabari	5.35	3.45	9.23	12.37
8	Sruthi	4.00	3.45	7.45	13.12
9	Sugan	3.43	1.57	8.34	12.34
10	Suganesh	2.09	4.53	7.54	11.21

(Time taken by minutes)

TAYLOR FRAME

Figure: 2
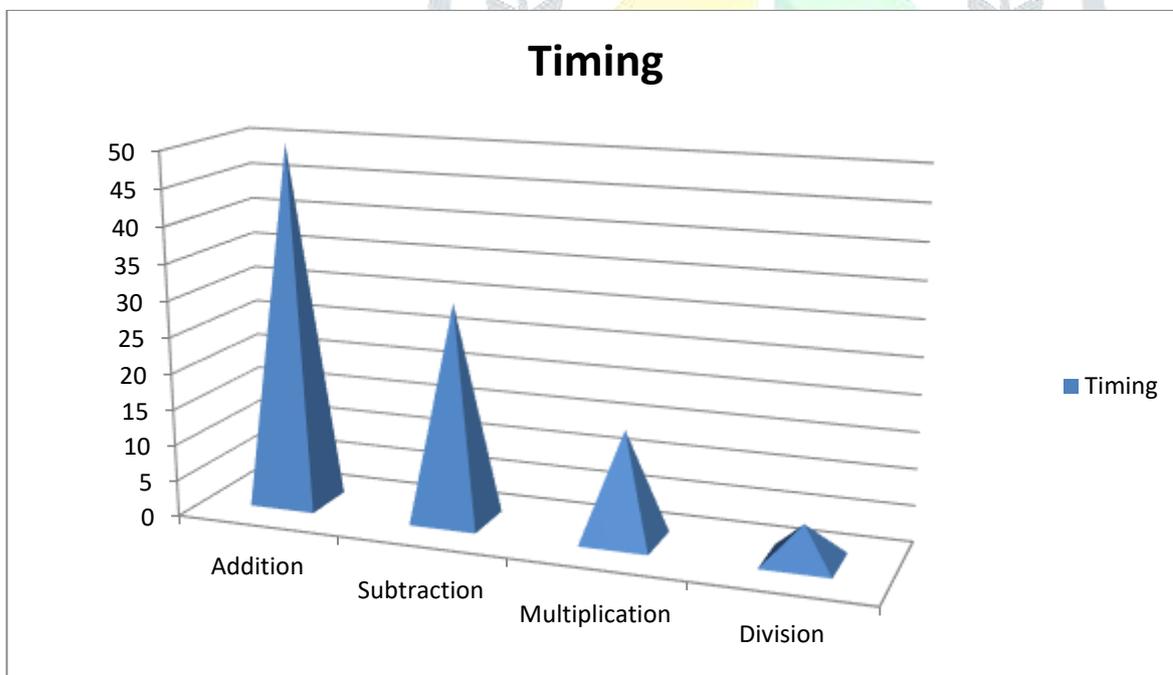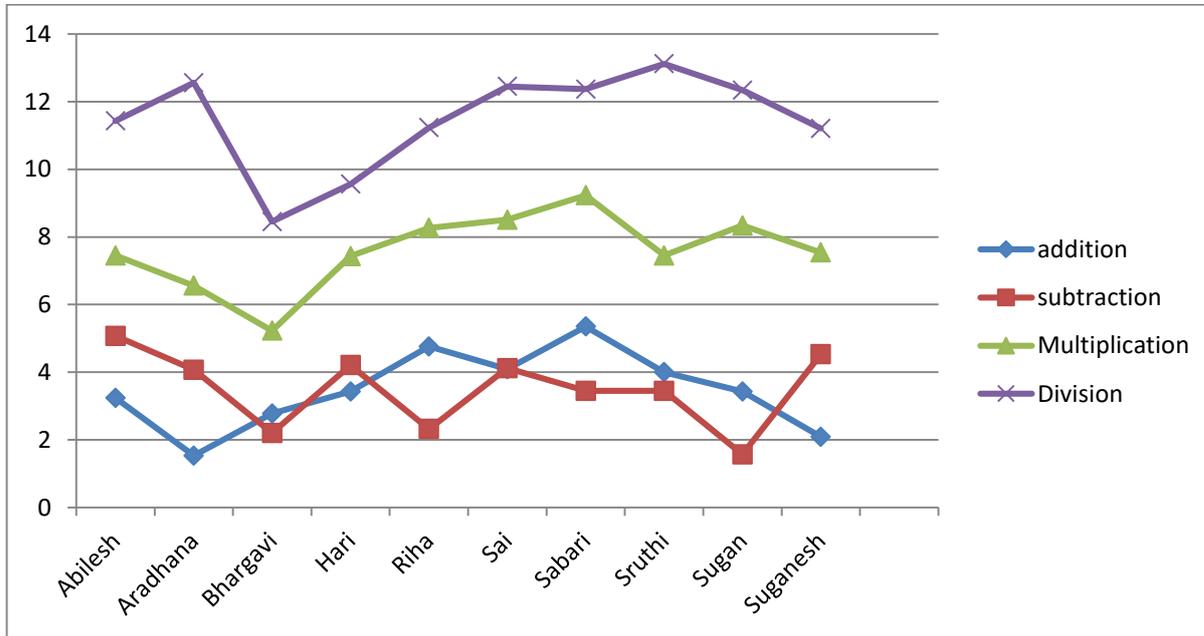
RESULTS:

The research paper represent all about the different age of special students with disability, but we mainly focuses on low vision and blind students. These students are primary class students between the ages of 6-9. The above students are doesn't have any other additional disability. According to the individual ability of the above students, we have

clearly explained the time taken by the students while doing arithmetical calculation with help of mathematical devices.

Figure 1 Represent the results of the students while doing calculation with the mathematical device called Abacus. By using this device it takes less time for doing Addition with help of mind calculation. When compare to Subtraction, because in that we need to borrow the number from the nearby number so it takes more time than that.

Figure 2 Represent all about their outcomes, while doing calculation with help of mathematical devices called Taylor frame. According to their ability we are calculating the timing consuming, how much time did they taken for doing calculation like Addition, Subtraction, multiplication and division. Some students they were taking less time, some of them were taking more time to do calculation because of their own ability. The above tabulation is clearly explained that while students were doing addition they taken less time because the process of addition may be easy for them. While doing subtraction they were taken little bit time than of addition, because if we subtract the number from given number sometime we need to borrow the number from the nearby number so it takes time. While doing multiplication it take more time than of addition and subtraction, because while multiplying the number we need to carry the number above the given number so it taken time. While doing division it takes much more time than that of addition, subtraction and multiplication, because the process of division having more steps, so it taken much more time.

CONCLUSION

As the research findings show, the students with visually impaired has overcome enormous obstacles to precede their education with help of devices like Taylor frame, Abacus etc. Normally visually impaired student's does calculation either on Taylor frame or Abacus for mathematical calculation. Taylor frame is better for Arithmetic calculations. Overall, there are some suggestions that can be considered to overcome the issues and challenges faced by visually impaired students.

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