

# TEACHERS' PERSPECTIVE ON TEACHING AND LEARNING OF MATHEMATICS BY THE STUDENTS WITH VISUAL IMPAIRMENT

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## *Abstract*

*This study explores the perspective of the special education teachers based on their experiences in teaching and learning of mathematics to the students with visual impairment. Regardless of any disability which includes students with visual impairment also have a legal right to access and make progress in the same grade level along with non-disabled peers. Visually impaired children in math learning can improve with the collaborative support of special and general teachers to extend and share their expertise in core curriculum and empower the visually impaired students' positive way of thinking math subject and representation of their role. The sample of the study consists of 115 special education teachers from Special and Inclusive schools. It is a qualitative research with descriptive survey method was used to collect the data by using the rating scale. It also discusses difficulties encountered by the visually impaired children in their learning mathematics and realistic ways to overcome such difficulties by getting the opinion from special education teachers. Based on the results, a majority (44%) of them agreed that mathematics subject as a difficult subject than the other subjects and 66% of them prefers need adaptation in math curriculum. Whereas, mathematics plays an important part of our human cultural heritage, and special education teachers have a responsibility to develop that heritage through possible ways in their teaching and learning process.*

**Keywords:** *Special Education Teachers, Inclusive Schools, Special Schools, Mathematics, Adaptation*

## INTRODUCTION

The ability to apply mathematical reasoning and thinking skills helps us to solve everyday problems through mathematical learning. Many people considered that mathematics to be the language of the universe, a vital instrument that influences our perceptions and interactions with the outside world. The advantages of understanding mathematical ideas for children with visual impairment go beyond the classroom; they impact their cognitive growth, preparedness for the workforce, and general performance in a world that is changing quickly. In addition, mathematical knowledge plays a crucial

role in understanding the contents of other school subjects.

## OBJECTIVES

- To explore the status of learning Mathematics by students with visual impairment.
- To know the special education teachers perspective on the performance of visually impaired students on various aspects of present Curriculum, Adaptation needed for teaching and learning Mathematics
- To know the difficulties faced and suggest possible ways to overcome by

visually impaired children in learning Mathematics

## **REVIEW OF RELATED STUDIES**

Teachers also lack background knowledge of practice and principle of inclusive education and lag far behind in acquired skills in the use of educational and assistive technology-oriented facilities on pupils with visual impairment in inclusive education. Therefore, it is suggested that teachers should receive inclusive education training and update their knowledge and attain skills in facilitating educational technology. (Eke & Inyang, 2015).

Government and non-governmental organisations provide scholarships to visually impaired students, and their school provides them with meals, housing, and a few academic supplies. They also receive extra time in maths lessons, help with exams, and support from peers. Qualified or certified special mathematics teachers should be hired in order to improve the education of visually impaired students studying mathematics (Oyebanji & Idiong, 2021).

It is important that Teachers of visually impaired prioritise teaching braille mathematics and utilising all available resources to address students' mathematical needs at higher education preparatory level (Rosenblum & Smith, 2012).

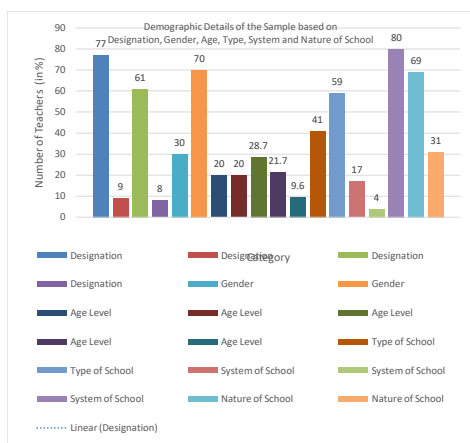
According to the authors, Teachers of visually impaired of special education teachers handling students with visual impairment play a variety of roles. They

must therefore feel confident in their ability to satisfy the varied requirements of their students and be well-prepared in all areas (Spungin and Ferrel, 2007).

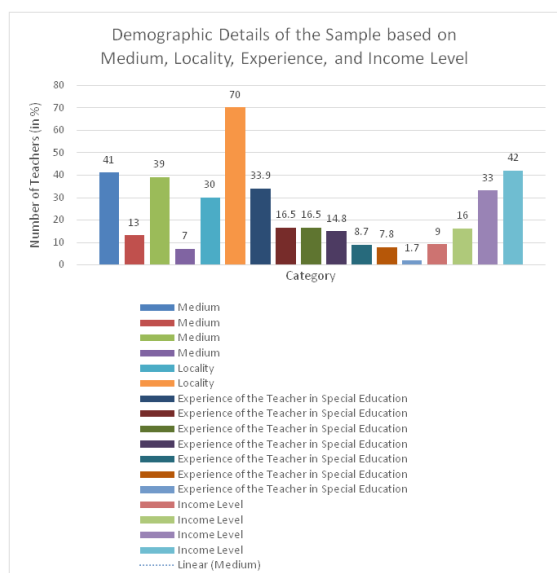
The purpose of this study to examine from the viewpoints of both students and teachers, the barriers that visually impaired students face when studying mathematics. According to the statistics, the following aspects had the highest barriers: administrative (94%), cultural (89%), and curricular (85%). The researchers advise offering curricula and supporting programs that cater to the needs of students with visual impairment. (Aljundi & Altakhayneh, 2020).

## **METHOD**

The sample of the study is selected 115 teachers from the inclusive and special schools of different districts of Tamilnadu, Kerala covering the primary level to higher secondary level teachers. It covers special education teachers from Government, Government aided and private schools.



**Figure 1: Demographic details of the sample of the study based on Designation, Gender, Age, Type, System and Nature of School**



**Figure 2: Demographic details of the sample of the study based on Medium, Locality, Experience and Income Level**

## ANALYSIS AND RESULTS

This section contains the qualitative information about the overall percentage of teachers' perspective on teaching and learning of mathematics by the visually impaired students among the selected sample. The data were analysed and interpreted in the following tables.

**Table 1: Teachers' Perspective on the present Curriculum for Teaching and Learning Mathematics to Students with Visual Impairment**

Sl. No.	Teachers' Perspective on the present Curriculum	Number	%
1.	Need Adaptation	40	35
2.	Materials and Tools not available	12	10
3.	Required Simplification in Math Syllabus	20	17
4.	Math Concept Difficulty	11	10
5.	Students not Interested	4	3.5
6.	Difficulty in Completing the Syllabus	3	2.5
7.	Need more practice	3	2.5
8.	Need ICT	6	5
9.	Present Curriculum not Suitable	16	14
	<b>Total</b>	<b>115</b>	<b>100</b>

From the above table it is understood that the teachers' perspective on the present curriculum for teaching and learning mathematics to students with visual impairment by the teachers. A majority of them felt that the present curriculum need adaptation for the students visual impairment, 10% of them told that adequate material and tools were not available for teaching and learning mathematics, 17% of them gave a suggestion that required simplified syllabus, 10% of them felt that majority of the math concepts were difficult, 3.5% of

them reported that visually impaired students were not showing interest in learning mathematics, 2.5% of them felt that need practice and ICT support for learning mathematics, 14% of them felt that the present curriculum is not suitable for the visually impairment.

**Table 2: Teachers' Perspective on the Adaptation needed for Teaching and Learning of Mathematics to Students with Visual Impairment**

Sl No	Teachers' Perspective on Adaptation	Number	%
1.	Need Adaptation in Teaching and Learning process in Mathematics	51	44
2.	Require more Teaching and Learning Materials	9	8
3.	Need Adaptation in Teaching Math Concept	17	15
4.	Need Adaptation in Method of Teaching	19	17
5.	Simplification of Math Syllabus	7	6
6.	Assistive Technology required	12	10
	<b>Total</b>	<b>115</b>	<b>100</b>

The above table depicts the teachers' perspective on Adaptation / Modification needed for teaching and learning of mathematics to students with visual impairment by the teachers. Among them, a majority (44%) of them revealed that need adaptation in teaching and learning mathematics, 8% of them felt that

require more teaching and learning materials, 15% of the were stated that need adaptation in teaching math concept, 17% of them stated that need adaptation in method of teaching, 6% felt that simplification of math syllabus and 10% of the suggested that assistive technology required for teaching and learning of mathematics to visually impaired students.

**Table 3: Teachers' Perspective on the Subject difficult to learn by Students with Visual Impairment**

Sl. No	Difficult Subject to learn by Visually Impaired Children	Number	%
1.	Mathematics	51	44.4
2.	Mathematics and Science	22	19
3.	Mathematics, Science and Social Science	5	4.4
4.	Mathematics and English	6	5
5.	Science	9	8
6.	Language and English	11	10
7.	All the Subjects	6	5
8.	None	5	4.4
	<b>Total</b>	<b>115</b>	<b>100</b>

The above table shows the teachers' perspective based on the subject difficult to learn by students with visual impairment. A majority (44.4%) of the teachers felt that mathematics alone was the more difficult subject than the other subjects, while others 19% of them felt that mathematics and Science both were difficult subject, 4.4% of them felt that Mathematics, Science and Social Science were the difficult subjects, 5% of them

told that Mathematics and English as difficult subjects, 8% of them Science as difficult subjects, 10% of them Language and English as difficult subjects, 5% of them felt all the subjects were difficult subject subjects and only 4.4% of them were mentioned none of the subjects were difficult subjects. Overall, majority of special education teachers felt that mathematics is the main subject difficult subject to students with visual impairment than the other subjects.

**Table 4: Teachers' Perspective based on Reason for Difficulties Faced Students with Visual Impairment in Learning Mathematics**

Sl No.	Reason for Difficulty in Learning Mathematics	Number	%
1.	Difficulty in Learning Formula or Equations	42	36.5
2.	Practical work in Maths	11	9.5
3.	Lack of Math Material Adaptation	4	3.5
4.	Difficulty in using Math Devices and Assistive Technology	3	3
5.	Difficulty in drawing diagrams	8	7
6.	Difficulty in Math Concepts	32	28
7.	Lack of Practice and Time	9	8
8.	No Difficulties	6	5

The above table analysed the reasons for difficulties faced students with visual impairment in learning

mathematics. From the table, we understand that a majority (36.5%) of the students with visual impairment facing difficulties in learning formulae or equations, 9.5% of them practical component in maths, 3.5% felt that lack of math material adaptation, 3% of them were not aware of the usage of math devices such as Abacus, Taylor Frame and Assistive technology, 7% of them felt that due to difficulty in drawing diagrams, 28% of them felt that difficulty in math concepts understanding, 8% of them due to lack of practice and time and 5% of them felt that there is no difficulties in learning mathematics.

**Table 5: Reason for Mathematics as a Difficult Subject than Other Subject**

Sl. No	Reason for Mathematics as a difficult subject than other Subject.	Number	%
1.	Abstractness	38	33
2.	Difficulty in Formula and Equations	27	23.5
3.	Requires more Practice and Time	19	16.5
4.	Students not Interested	5	4
5.	Memory Problems	4	3.5
6.	Devices are not available and not knowing to use the devices	4	3.5
7.	No difficulties	18	16
	<b>Total</b>	<b>115</b>	<b>100</b>

The above table shows that reasons for difficulty in learning mathematics subject than other subject based on the

perspective of the teachers. A majority (33%) of them felt that abstractness of mathematics, 23.5% of them felt that difficulty in lot of formula and equation in mathematics, 16.5% felt that mathematical problem solving takes more time and practice, only 4% of them felt the visually impaired students were not showing interest in learning mathematics, 3.5% of them felt that memory of math tables and formulae is difficult and math devices were not available and not knowing the use of devices and 18% of them felt that none of the difficulties facing in learning mathematics.

## DISCUSSION

Have a good rapport and communication with parents. Discuss about their child's potential capabilities and weaknesses and challenges and ways to help in their home for managing their academic behavioral issues with special focus to difficult subject like math. Special Education teaches also should equip themselves to teach mathematics subject and using of math devices to students with visual impairment. The general math teachers in inclusive setup schools, also should undergo a short-term training or course to handle the students with visual impairment and fulfil their responsibilities to handle diverse learners in their classroom.

All the teachers and other professionals who are all involved with the children with visually impairment should update their knowledge and skills, develop and adjust their teaching techniques by the way of attending workshops, In-service

training course, bridge course. Provide proper seating arrangement and space to keep their math braille books materials Abacus and Taylor frame and work in a comfortable way.

## CONCLUSION

Most people believe that mathematics is a hard subject. Many students stop studying mathematics as soon as it is no longer required of them because of misconceptions about mathematics. If it is left unattended, students with visual impairment will be less able to acquire a variety of critical subjects, which will limit their employment prospects in the future and deprive society of a potential pool of citizens who are literate in mathematics. Mathematics is a gateway to many scientific and technological fields. Although most students find mathematics difficult, it is seen to be a necessary prerequisite for success in today's world. Teacher Pedagogical knowledge and math content knowledge are very essential to provide meaningful teaching and learning process and its success.

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