A REPORT

ON

"REASONS FOR LOW PERFORMANCE IN MATHEMATICS OF CLASS 8 STUDENTS IN PURULIA DISTRICT OF WEST BENGAL"

State Council of Educational Research & Training, West Bengal
School Education Department
Government of West Bengal
25/3, Ballygunge Circular Road
Kolkata-700019

This report is printed and published by using the fund placed at SCERT (WB) by
Paschim Banga Samagra Shikhsha Mission

Published by: The Director,
State Council of Educational Research & Training, West Bengal
School Education Department
Government of West Bengal
25/3, Ballygunge Circular Road
Kolkata-700019

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Date: September, 2022

Preface

National Achievement Survey (NAS) is a nationally representative large-scale survey of students' attainment of Learning Outcomes undertaken by the Ministry of Education, Government of India. NAS assesses the health of the school education system. The findings help to understand the gaps in learning so that appropriate measures may be taken for improvement of the situation.

On the basis of the NAS 2021 results, the present dipstick study titled "**The Reasons for Low Performance in Mathematics of class 8 students of Purulia district of West Bengal**" was taken up to understand the reasons for low achievement in Mathematics of class 8 students, and to suggest measures to improve the learning achievement.

To identify the reasons and concerns regarding different issues, four types of opinionnaire were designed involving experts. These opinionnaires were for –

i) Head of the Institutions (HoI)

ii) Teachers teaching Mathematics in class 8 of the selected schools

iii) Students of class 8

iv) Parents /guardians (of class 8 students)

The responses of the Head of the Institutions (HoI), teachers, students and guardians were analysed and the analysis report of this study is presented along with some observations and comments.

The Learning Outcomes tested in NAS for class 8 were matched with the textbooks of class 8 used in the Government/ Government sponsored / aided schools of West Bengal.

SCERT (WB) is thankful to the Heads of the institutions where the tools of this study were administered, their teachers and particularly to the students of the 4 selected schools. SCERT (WB) is also thankful to the Sr. Lecturer-in-Charge, DIET Purulia, its faculty member and trainee teachers who acted as Field Investigators for this survey.

Smt. Rituparna Mukherjee, Assistant Technician of DIET, Jhargram has provided technical support for this study.

The study would bear fruit if proper initiatives are taken to address the issues so that the learning gaps, if any, are bridged and the learners attain the Learning Outcomes.

Date: September, 2022

Dr. Chhanda Ray

Director, SCERT , West Bengal

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CHAPTER 1

INTRODUCTION

The National Achievement Survey (NAS) was conducted throughout the country on November 13, 2021, NCERT, under the aegis of Ministry of Education, for Classes 3, 5, 8 and 10 in government, government-aided schools, private recognized and central government schools. There were 50 questions for classes 3 and 5, 60 questions for class 8, 70 questions for class 10 in Mathematics, Language, Sciences, Environmental Studies and Social Sciences. The survey assessed the attainment of learning outcomes by the learners. The findings of the survey help guide the education policy, planning and implementation at National, State, District and classroom levels to improve the learning levels of children and bring about qualitative improvements.
The survey in West Bengal covered a total of 3110 schools, 14959 teachers and 98694 students. For class 8 there were 1187 schools, 4559 teachers and 30853 students.

1.1 Background of the Study

The national, state and district level reports of NAS 2021 were released in May 2022. NCERT under the guidance of MoE planned to facilitate dipstick studies for designing remedial action that would improve learning level of students. Several areas of concern emerged from the results of NAS 2021 which need immediate attention. The dipstick study provides an in depth assessment in a short time.

With this in view, SCERT (WB) studied the result for each subject and each class carefully, and decided that a dipstick study would be taken up to analyse the low performance of class 8 students of the state in Mathematics. The present study **"The Reasons for Low Performance in Mathematics of class 8 students of Purulia district of West Bengal"** was the effort in the direction of analyzing the reasons for low achievement in Mathematics, and whether there was a noticeable difference between urban and rural areas, and between boys and girls. The study title was endorsed by NCERT.

1.2 Objectives of the Study

The objectives of the study were:

1. To find out the reasons behind low performance of boy and girl students of class 8 in Mathematics
2. To find out the reasons behind low performance of rural and urban students of class 8 in Mathematics
3. To find out how the absence of offline teaching affected the performance of class 8 students in Mathematics during pandemic situation from the students' point of view
4. To find out how the absence of offline teaching affected the performance of class 8 students in Mathematics during pandemic situation from the teachers' point of view

CHAPTER 2

METHODOLOGY

2.1 Sampling

For the present study, Purulia district was selected purposively. The performance of many of the North Bengal districts, Birbhum and Purulia was quite poor in Mathematics. But considering the issue of access, Purulia was considered to be more convenient. In the district, 4 co-educational schools were selected (2 rural and 2 urban). From each school the opinions of the Headmaster, 2 teachers teaching Mathematics in class 8, 10 guardians of class 8 students and 20 students (10 boys and 10 girls) of class 8 were collected. The students of class 8 for the study were selected randomly.

2.2 Tools

To identify the reasons for low achievement in Mathematics of class 8 students, questionnaires for four target groups were designed involving experts. The target groups were –

i) Heads of the Institutions (HoI)
ii) 2 teachers teaching Mathematics in class 8
iii) Students of class 8
iv) Parents / Guardians of students of class 8

Additionally, a matrix for matching of the tested Learning Outcomes with the textbooks of class 8 used in the Government/ Government sponsored / aided schools of West Bengal was also designed for the present study. The matching was done by in service school teachers in Mathematics.

2.3 Administration of the Tools

The procedure of selection of schools, students and administration of four types of questionnaires was thoroughly discussed with the district level functionaries of Purulia.

CHAPTER-3

FINDINGS OF THE STUDY

The responses of Head of the Institution (HoI), teachers, parents / guardians and students were analysed and a matrix was designed to match the tested LOs with the textbooks. The findings of the analyses and the matrix are presented in the following pages.

3.1 ANALYSIS OF HEAD TEACHERS' RESPPONSES

Four (4) schools were selected for the purpose of the study. All the four schools are higher secondary. Of these, 2 are located in urban municipality area and 2 in rural area.

3.1.1 Total number of students in class 8 in the selected schools

The total number of students in class 8 of the 4 surveyed schools is 576 (331 boys and 245 girls).

Table – 3.1: Total number of students in class 8

Category of students	Number	Percentage
Boys	331	57.47
Girls	245	42.53
Total	576	-

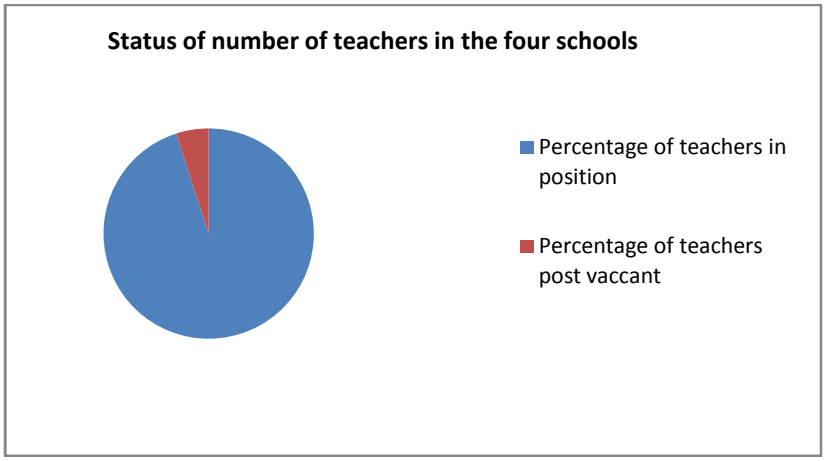
3.1.2 Status of number of teachers in the four schools

The total number of sanctioned posts for teachers in the 4 surveyed schools is 120 and the number of teachers in position is 114. 6 posts are lying vacant.

Table – 3.2: Status of number of teachers in the four schools

Number of teachers in position	Number of sanctioned posts	Percentage of teachers in position	Percentage of vacant posts
114	120	95	5

Fig. 3.1: Status of number of teachers in the four schools



Issues related to teaching-learning

3.1.3 Familiarity with the Learning Outcome document published by different agencies

75% of the respondents said that they are familiar with the Learning Outcome document published by NCERT (2017) and only 25% of the respondents are familiar with that published by an appropriate state agency.

According to the respondents, the Learning Outcomes have been communicated to different stakeholders (students, parents / guardians and SMC members).

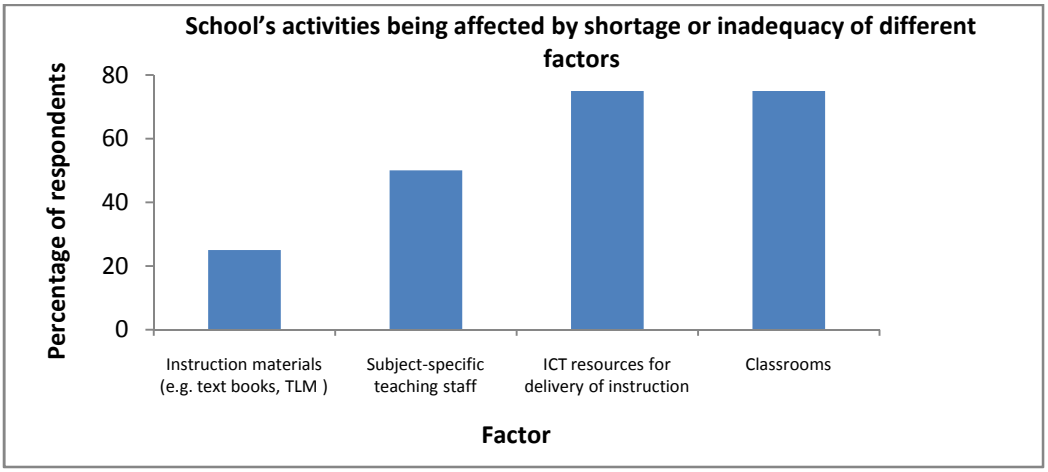
3.1.4 School's activities being affected by shortage or inadequacy of different factors

When asked about the different factors the shortage or inadequacy of which affected the school's activities, 75% of the respondents each mentioned the inadequacy of ICT resources for delivery of instruction and shortage of classrooms. According to half of the respondents, shortage of subject-specific teaching staff affects the school's activities. For 25 % of the respondents, inadequacy of instruction materials (e.g. text books, TLM) has impact on the proper functioning of a school.

Table – 3.3: School's activities being affected by shortage or inadequacy of different factors

Shortage or inadequacy of the factor	Percentage of respondents
Instruction materials (e.g. text books, TLM)	25
Subject-specific teaching staff	50
ICT resources for delivery of instruction	75
Classrooms	75

Fig. 3.2: School's activities being affected by shortage or inadequacy of different factors



3.1.5 Question papers for evaluation

All the respondents said that the question papers for evaluation are developed by subject teachers of the school. They are not procured from external sources.

3.1.6 Extent of effectively assessing the attainment of learning outcomes by the question papers

The respondents are equally divided in their opinion about the effectiveness of the question papers in assessing the attainment of learning outcomes by the learners. Half of the respondents said that they are highly effective while the other half stated that they were only moderately effective.

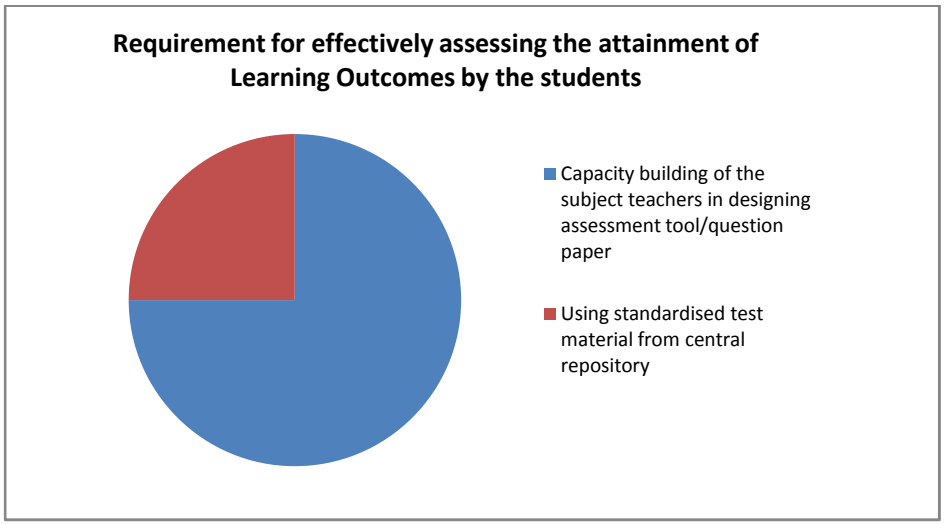
3.1.7 Requirement for effectively assessing the attainment of Learning Outcomes by the students

75% of the respondents are of the opinion that capacity building of the subject teachers in designing assessment tool/question paper is necessary for effectively assessing the attainment of Learning Outcomes by the students. On the other hand, 25% of the respondents feel that use of standardised test material from central repository would serve the purpose.

Table – 3.4: Requirement for effectively assessing the attainment of Learning Outcomes by the students

Requirement	Percentage of respondents
Capacity building of the subject teachers in designing assessment tool/question paper	75
Using standardised test material from central repository	25

Fig. 3.3: Requirement for effectively assessing the attainment of Learning Outcomes by the students



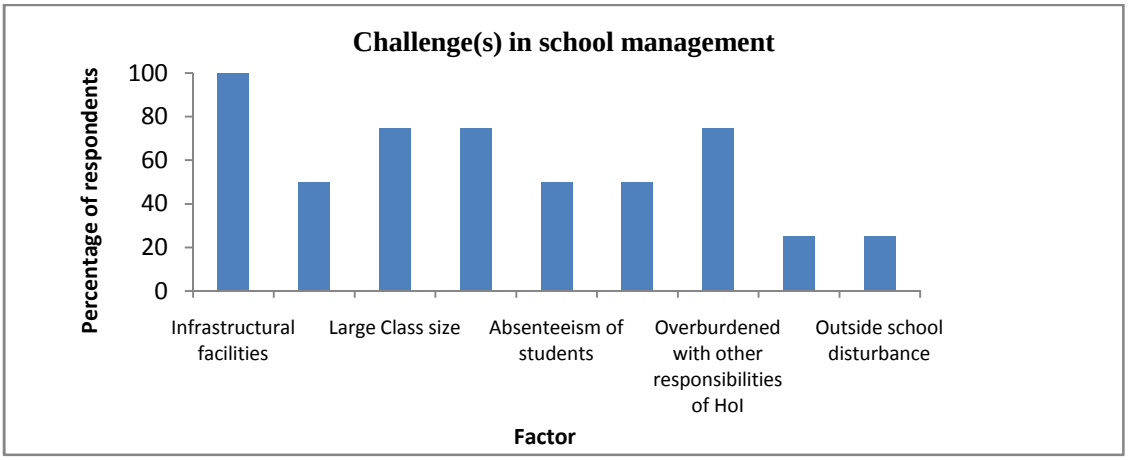
3.1.8 Challenge(s) in school management

All the respondents agreed that availability of infrastructural facilities is the greatest challenge in school management. The other major challenges are large class size, classroom management by teachers and being overburdened with other responsibilities. Allocation of resources, absenteeism of students and absenteeism of teachers also impose hurdles in the way of school management. No subject specific orientation to the teachers and outside school disturbances too are some of the minor challenges.

Table – 3.5: Challenge(s) in school management

Challenge	Percentage of respondents
Infrastructural facilities	100
Allocation of resources	50
Large Class size	75
Classroom Management by teachers	75
Absenteeism of students	50
Absenteeism of teachers	50
Being overburdened with other responsibilities	75
No orientation	25
Outside school disturbance	25

Fig. 3.4: Challenge(s) in school management



3.1.9 Strategies adopted by the school to continue education at the time school closure during the pandemic

The respondents said that online teaching was organized for classes 9 and 10 only. Moreover, class 8 was taught mainly through formation of WhatsApp groups.

3.1.10 Organisation of capacity building programmes for the teachers to facilitate online teaching

Half of the respondents organized capacity building programmes for the teachers to facilitate online teaching.

3.1.11 Specific steps taken to engage the students in learning process in remote mode

Orientation of parents and students was taken up to convince them about the importance of online teaching learning during the pandemic.

3.1.12 Strategy adopted after reopening of the school to compensate the learning loss incurred due to school closure during the pandemic

Special and individual care was taken. Help of bridge course books were taken, and students were motivated to come back to the school.

3.2 ANALYSIS OF MATHEMATICS TEACHERS' RESPPONSES

In all, responses were collected from 8 Mathematics teachers teaching in class 8 of the selected 4 schools.

General Information

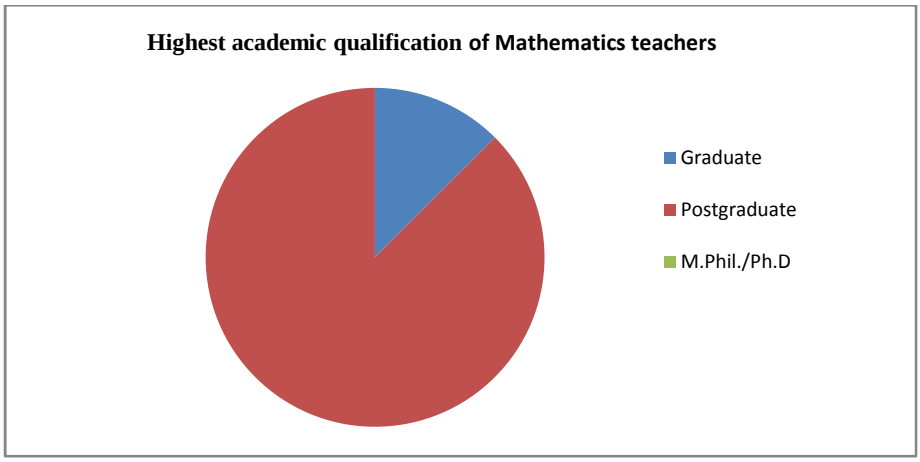
3.2.1 Highest academic qualification

87.5% of the respondents are postgraduates while 12.5% are graduates. None of them have M.Phil./Ph.D. degree.

Table – 3.6: Highest academic qualification of Mathematics teachers

Highest academic qualification	Percentage of respondents
Graduate	12.5
Postgraduate	87.5
M.Phil. / Ph.D.	0

Fig. 3.5: Highest academic qualification of Mathematics teachers



3.2.2 Professional qualification

All the respondents have B. Ed. degree as professional qualification.

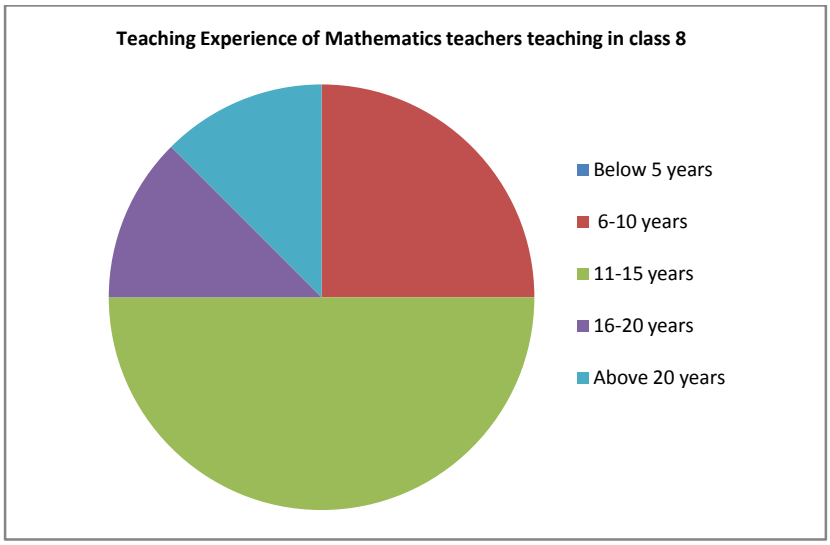
3.2.3 Teaching Experience of Mathematics teachers teaching in class 8

The teaching experience of half of the teachers is 11-15 years. 25% of the teachers have teaching experience of 6-10 years. 12.5% each of the respondents have been teaching for 16-20 years and for more than 20 years.

Table – 3.7: Teaching Experience of Mathematics teachers teaching in class 8

Teaching Experience	Percentage of respondents
Below 5 years	0
6-10 years	25
11-15 years	50
16-20 years	12.5
Above 20 years	12.5

Fig. 3.6: Teaching Experience of Mathematics teachers teaching in class 8



3.2.4 Mathematics as a subject at the Graduation level

All the Mathematics teachers under the ambit of the study had Mathematics as a subject at the graduation level.

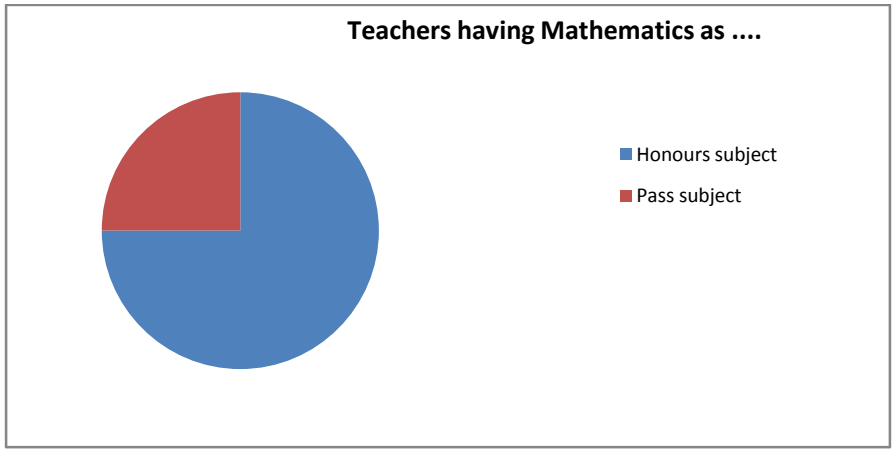
3.2.5 Mathematics as major (Honours) subject or minor (Pass) subject at the graduation level

75% of the respondents had Mathematics as major (Honours) subject and 25% of the respondents had Mathematics as minor (Pass) subject at the graduation level.

Table – 3.8: Mathematics as major (Honours) subject or minor (Pass) subject

Mathematics as	Percentage of respondents
Honours subject	75
Pass subject	25

Fig. 3.7: Mathematics as major (Honours) subject or minor (Pass) subject



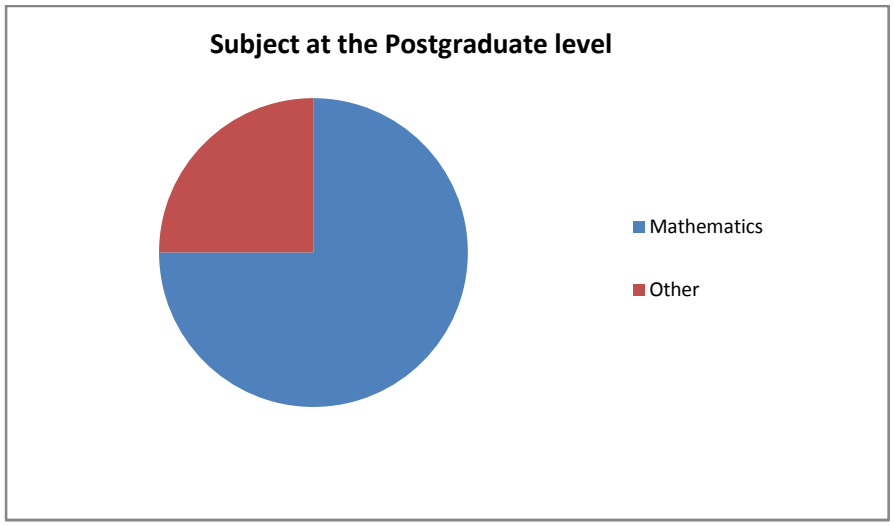
3.2.6 Subject at the Postgraduate level

For 75% of the respondents, Mathematics was the subject at the postgraduate level, and 25 % had another subjects at that level.

Table – 3.9: Subject at the Postgraduate level

Subject at the Postgraduate level	Percentage of respondents
Mathematics	75
Other	25

Fig. 3.8: Subject at the Postgraduate level



3.2.7 Teaching of any subject other than Mathematics in any class

Only two (2) teachers teach subjects other than Mathematics. One of them, with Chemistry at the postgraduate level, teaches Environment Science in classes 6 and 8. The second teacher, who had Physics at the postgraduate level, teaches Physical Science in class 9 and Biology in Class 6.

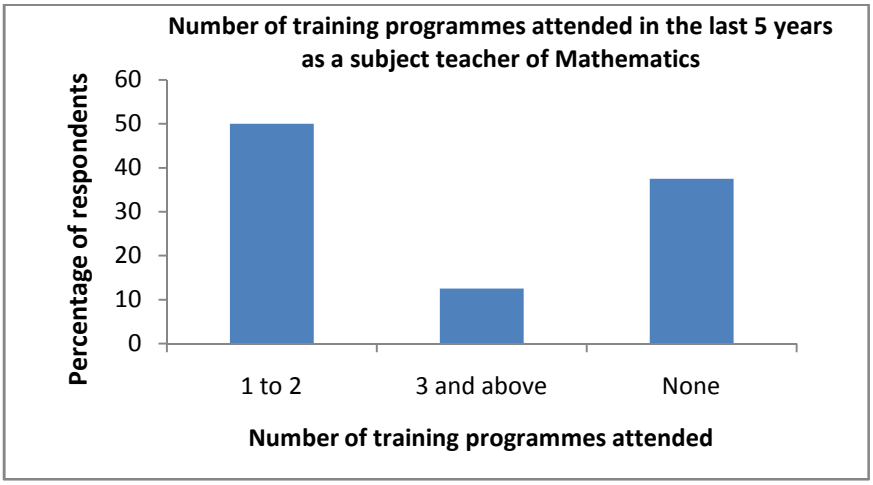
3.2.8 Number of training programmes attended in the last 5 years as a subject teacher of Mathematics

In the last 5 years, 37.5% of the respondents have not attended any training programme as subject teachers, 12.5% have attended 3 or more training programmes, while half of the respondents have attended 1 to 2 training programme(s).

Table – 3.10: Number of training programmes attended in the last 5 years as a subject teacher of Mathematics

Number of training programmes attended	Percentage of respondents
1 - 2	50
3 and above	12.5
None	37.5

Fig. 3.9: Number of training programmes attended in the last 5 years as a subject teacher of Mathematics



3.2.9 Knowledge about the Learning Outcome document published by different agencies

As for the Learning Outcome document published by different agencies, 87.5% of the respondents have knowledge about the document published by NCERT (2017), and 12.5% of the respondents know about the document published by an appropriate state agency.

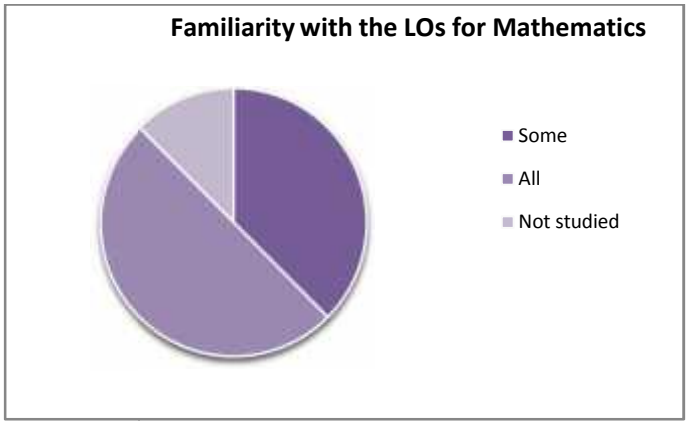
3.2.10 Familiarity with the LOs for Mathematics

Half of the respondents said that they are familiar with all the LOs for Mathematics and 37.5% said that they are familiar with some the LOs for Mathematics. The LOs for Mathematics have not been studied by 12.5 % of the respondents.

Table – 3.11: Familiarity with the LOs for Mathematics

Familiarity with the LOs for Mathematics	Percentage of respondents
Some	37.5
All	50
Not studied	12.5

Fig. 3.10: Familiarity with the LOs for Mathematics



3.2.11 Attending training programme(s) on Learning Outcomes

Only 12.5 % of the respondents said that they have attended training programme(s) on Learning Outcomes.

3.2.12 Number of training programmes on Learning Outcomes attended

2 training programmes on Learning Outcomes were attended by the respondents who said that they had attended such training programme(s).

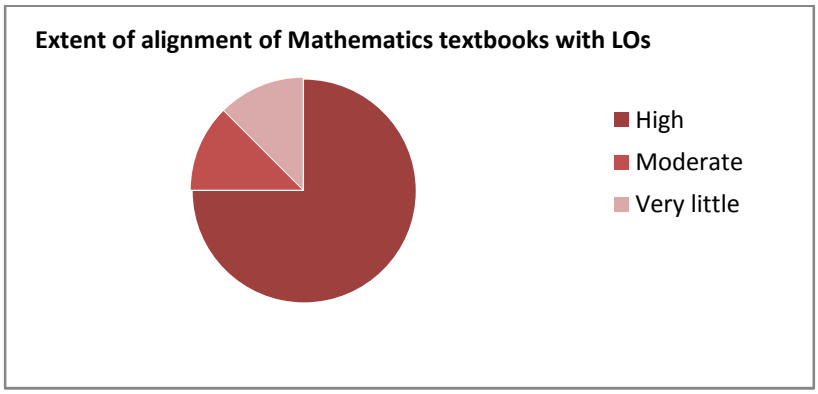
3.2.13 Extent of alignment of Mathematics textbooks with LOs

According to 75% of the respondents, the extent of alignment of Mathematics textbooks with LOs is high while 12.5% of the respondents say that the extent of alignment is moderate. As for another 12.5% of the respondents, there is very little alignment of Mathematics textbooks with LOs.

Table – 3.12: Extent of alignment of Mathematics textbooks with LOs

Extent of alignment of Mathematics textbooks with LOs	Percentage of respondents
High	75
Moderate	12.5
Very little	12.5

Fig. 3.11: Extent of alignment of Mathematics textbooks with LOs



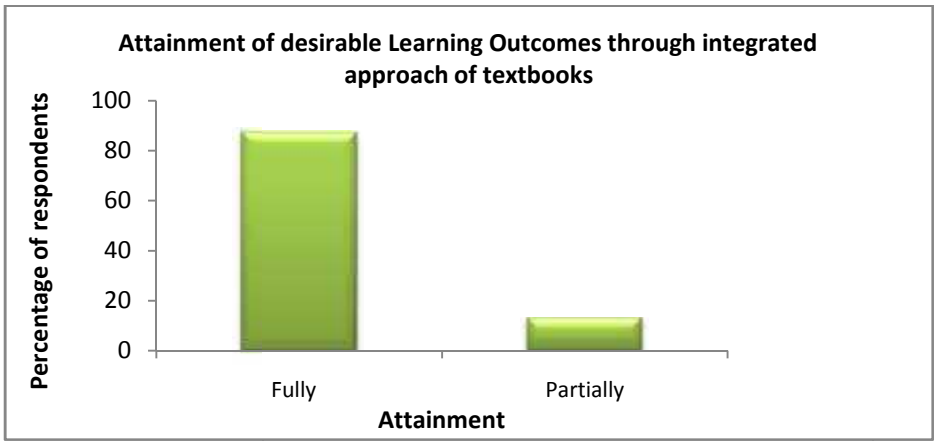
3.2.14 Attainment of desirable Learning Outcomes through integrated approach of textbooks

87.5% of the respondents are of the opinion that the integrated approach adopted in the textbooks caters to the attainment of desirable Learning Outcomes among the students. The remaining 12.5% of the respondents feel that the attainment of desirable Learning Outcomes is only partial.

Table – 3.13: Attainment of desirable Learning Outcomes through integrated approach of textbooks

Attainment of desirable Learning Outcomes through integrated approach of textbooks	Percentage of respondents
Fully	87.5
Partially	12.5

Fig. 3.12: Attainment of desirable Learning Outcomes through integrated approach of textbooks



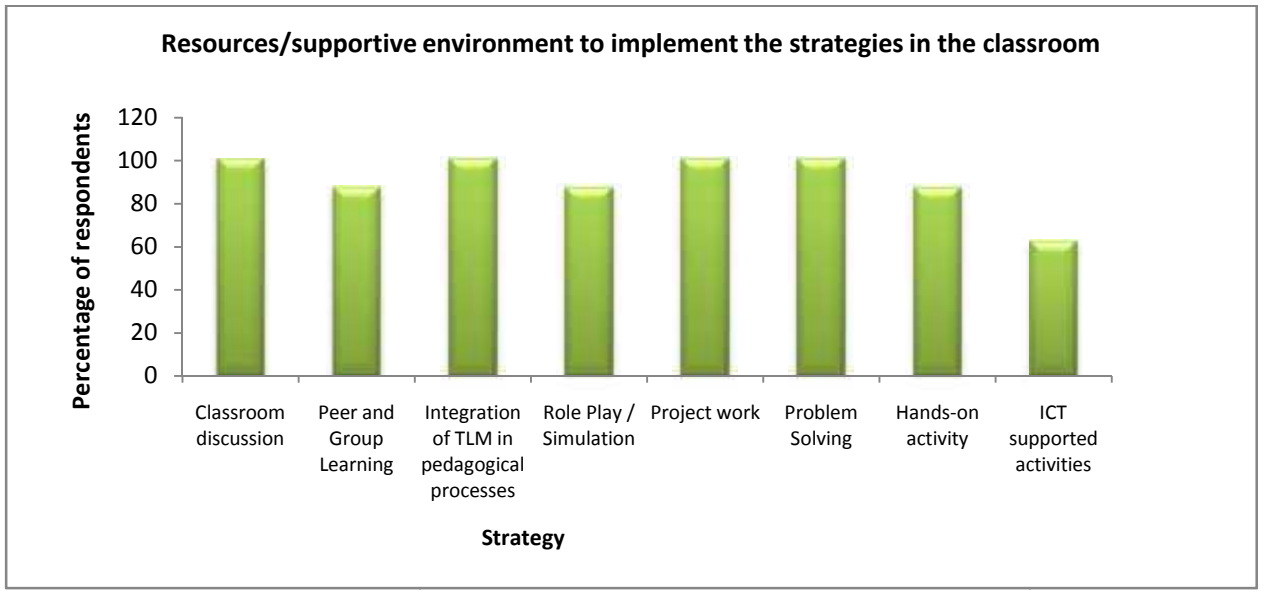
3.2.15 Availability of resources/supportive environment to implement certain strategies in the classroom

All the respondents say that resources/supportive environment are available for implementing classroom discussion, integration of TLM in pedagogical processes, project work and problem solving. 87.5% of the respondents say that it is possible to implement peer and group learning, role play / simulation and hands-on activity with the resources/ supportive environment available. According to 62.5% of the respondents, it is possible carry out ICT supported activities with the resources available.

Table – 3.14: Availability of resources/supportive environment to implement certain strategies in the classroom

Strategy	Percentage of respondents
Classroom discussion	100
Peer and Group Learning	87.5
Integration of TLM in pedagogical processes	100
Role Play / Simulation	87.5
Project work	100
Problem Solving	100
Hands-on activity	87.5
ICT supported activities	62.5

Fig. 3.13: Availability of resources/supportive environment to implement certain strategies in the classroom



3.2.16 Measures to be taken by teachers to improve achievement of students in Mathematics

The teachers are of the opinion that imparting lesson with real life examples and time to time revision of curriculum and textbooks are the measures that should be taken by teachers to improve achievement of students in Mathematics.

3.2.17 Strategies adopted to teach Mathematics during school closure in emergency

The Mathematics teachers said that they arranged online classes for the students and provided them with activity based homework.

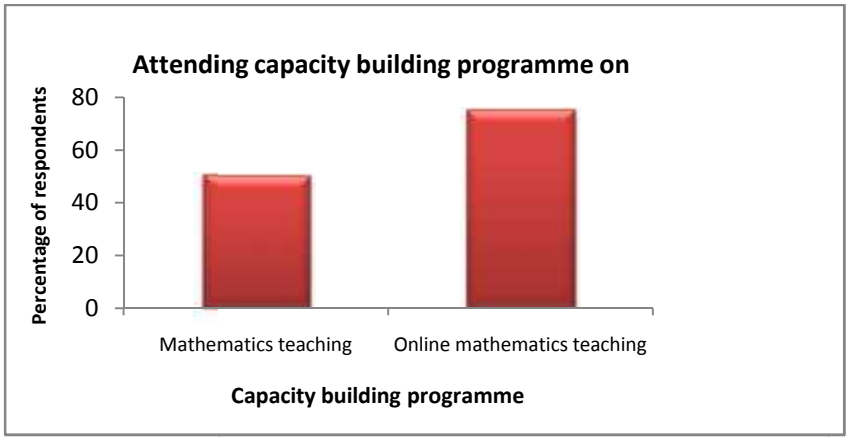
3.2.18 Attending capacity building programmes

50% of the respondents said that they attended offline (face to face) capacity building programmes on Mathematics teaching, while capacity building programmes on online Mathematics teaching was attended by 75% of the respondents.

Table – 3.15: Attending capacity building programmes

Attending capacity building programmes on	Percentage of respondents
Mathematics teaching	50
Online mathematics teaching	75

Fig. 3.14: Attending capacity building programmes



3.2.19 Strategies adopted after reopening of schools

The strategies adopted after re-opening of the school to compensate for the learning loss incurred in Mathematics due to school closure during the pandemic include taking help of bridge course books, holding of revision classes and helping students who need special care in Mathematics.

3.3 ANALYSIS OF STUDENTS' RESPPONSES

The total number of students on whom the study was conducted in the selected 4 schools was 80, of whom 40 were from rural schools and 40 students were from urban schools. From each locality, 20 boys and 20 girls were selected.

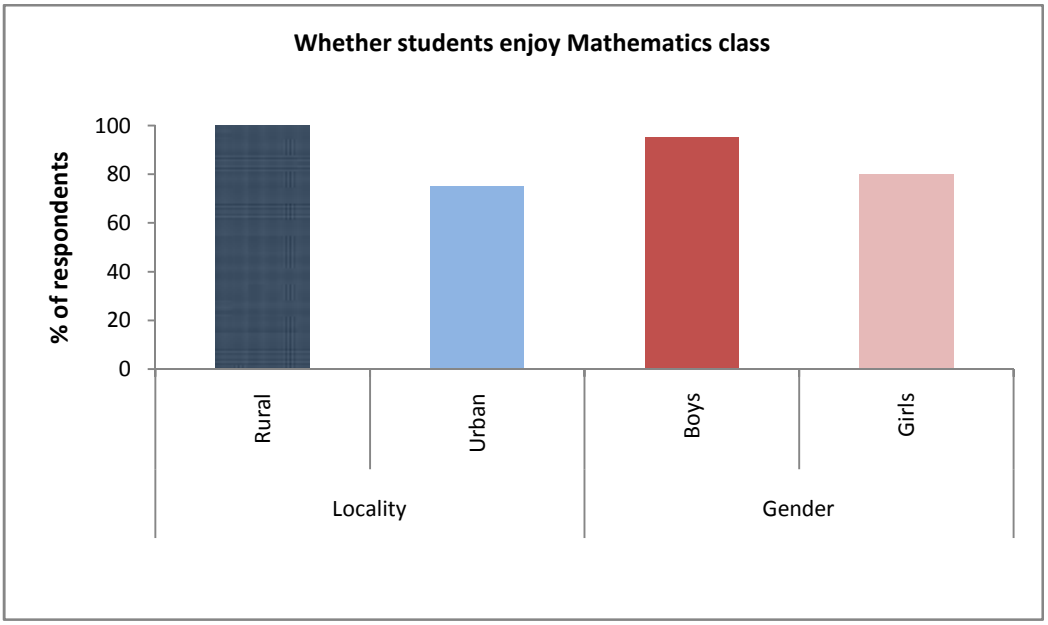
3.3.1 Whether students enjoy Mathematics class

All rural students and 75% of the urban students say that they enjoy the Mathematics classes. Taking the gender of the students into consideration, 95% of the boys and 80% of the girls say that Mathematics classes are enjoyed by them.

Table – 3.16: Whether students enjoy Mathematics class

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether students enjoy Mathematics class	100	75	95	80

Fig. 3.15: Whether students enjoy Mathematics class



REASONS FOR ENJOYING MATHEMATICS CLASSES – For a very few Mathematics is an interesting subject, but for most the interest is there as it is a fundamental subject. Some students say that the school teacher plays a vital role in making the subject interesting to the students.

REASONS FOR NOT ENJOYING MATHEMATICS CLASSES – Some students have Mathematics phobia and others simply dislike the subject as they find it difficult.

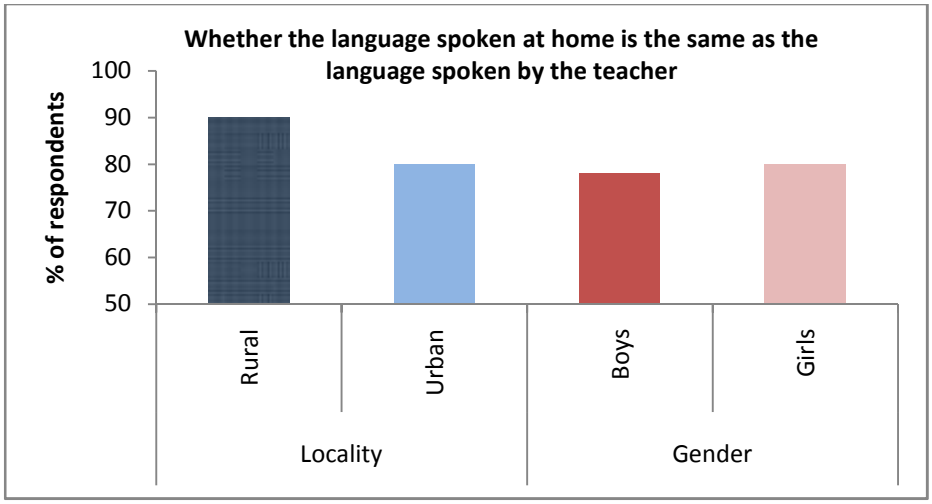
3.3.2 Whether the language spoken at home is the same as the language spoken by the teacher

90% of rural students and 80% of urban students, 78% boys and 93% girls say that the language spoken at home is the same as the language spoken by the teacher in school.

Table – 3.17: Whether the language spoken at home is the same as the language spoken by the teacher

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the language spoken at home is the same as the language spoken by the teacher	90	80	78	93

Fig. 3.16: Whether the language spoken at home is the same as the language spoken by the teacher



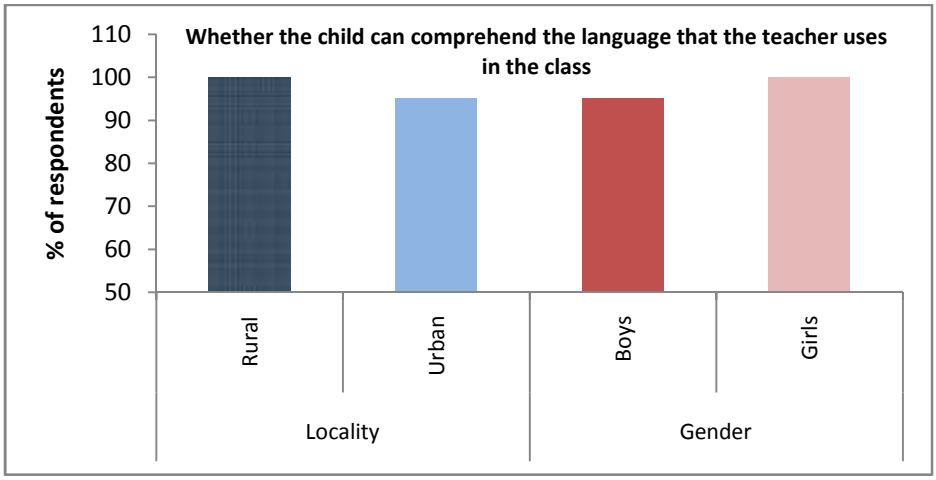
3.3.3 Whether the child can comprehend the language that the teacher uses in the class

All rural students and all girls say that they can comprehend the language that the teacher uses in the class. For urban students and boys, this is true for 95% students each.

Table – 3.18: Whether the child can comprehend the language that the teacher uses in the class

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child can comprehend the language that the teacher uses in the class	100	95	95	100

Fig. 3.17: Whether the child can comprehend the language that the teacher uses in the class



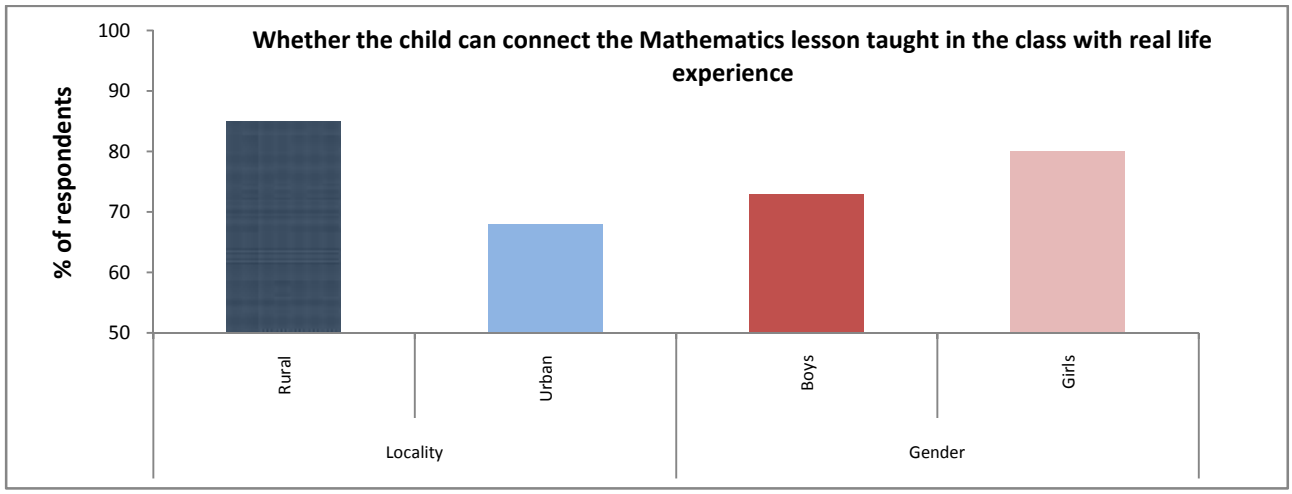
3.3.4 Connecting Mathematics with real life situations

As for connecting the Mathematics lesson taught in the class with real life experience, 85% and 68% of rural and urban students respectively, and 73% boys and 80% girls answered in the affirmative.

Table – 3.19: Connecting Mathematics with real life situations

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child can connect the Mathematics lesson taught in the class with real life experience	85	68	73	80

Fig. 3.18: Connecting Mathematics with real life situations



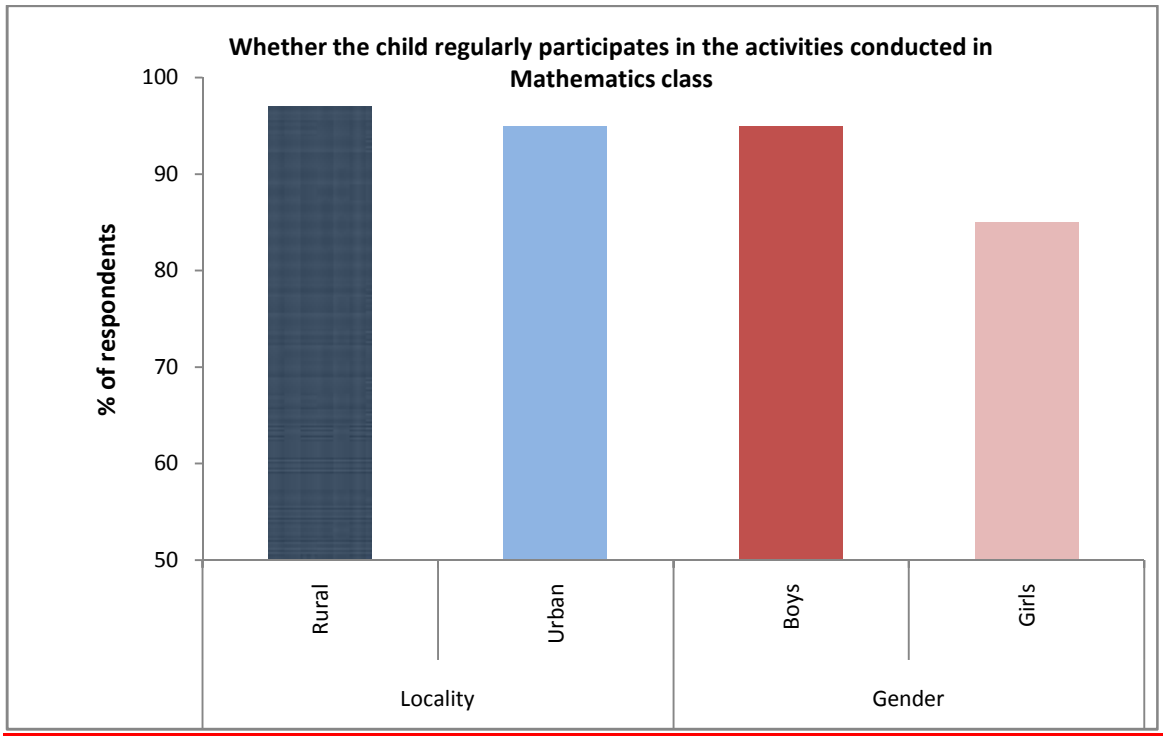
3.3.5 Whether the child regularly participates in the activities conducted in Mathematics class

97% of rural students, 95% each of urban students and boys and 95% of girls say that they regularly participate in the activities conducted in the Mathematics class.

Table – 3.20: Whether the child regularly participates in the activities conducted in Mathematics class

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child regularly participates in the activities conducted in Mathematics class	97	95	95	85

Fig. 3.19: Whether the child regularly participates in the activities conducted in Mathematics class



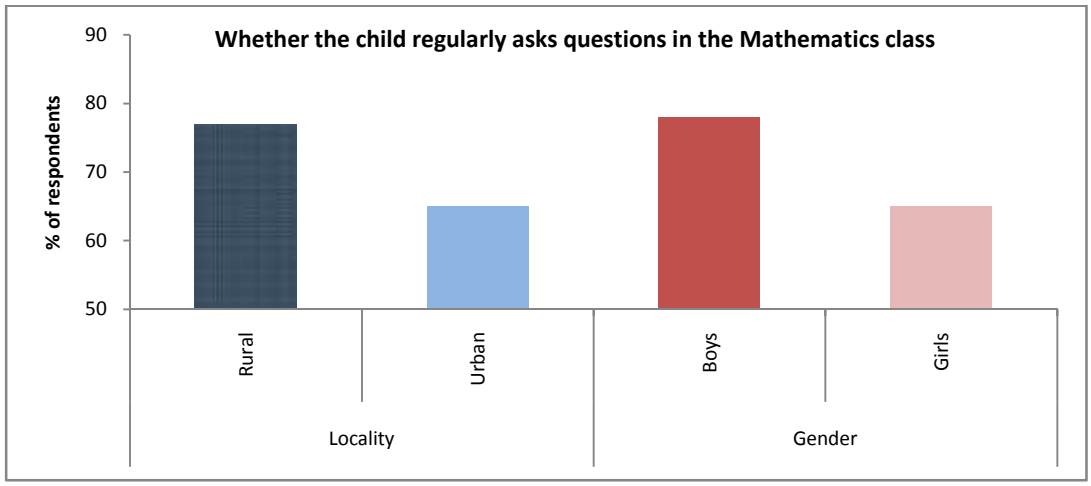
3.3.6 Whether the child regularly asks questions in the Mathematics class

Questions are regularly asked in the Mathematics class by 77% of rural students, 65% each of urban students and girls and 78% boys.

Table – 3.21: Whether the child regularly asks questions in the Mathematics class

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child regularly asks questions in the Mathematics class	77	65	78	65

Fig. 3.20: Whether the child regularly asks questions in the Mathematics class



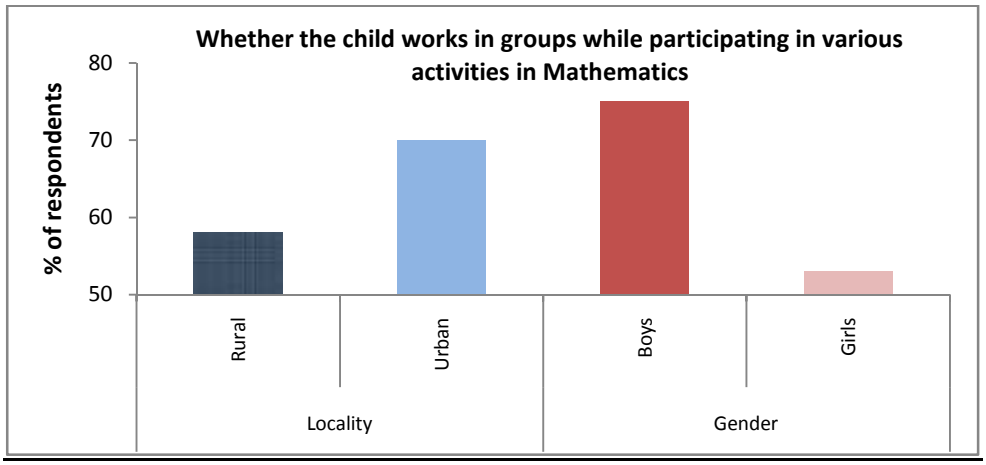
3.3.7 Whether the child works in groups while participating in various activities in Mathematics

58% of rural students, 70% of urban students, 75% of boys and 53% of girls state that they work in groups while participating in various activities of Mathematics.

Table – 3.22: Whether the child works in groups while participating in various activities in Mathematics

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child works in groups while participating in various activities in Mathematics	58	70	75	53

Fig. 3.21: Whether the child works in groups while participating in various activities in Mathematics



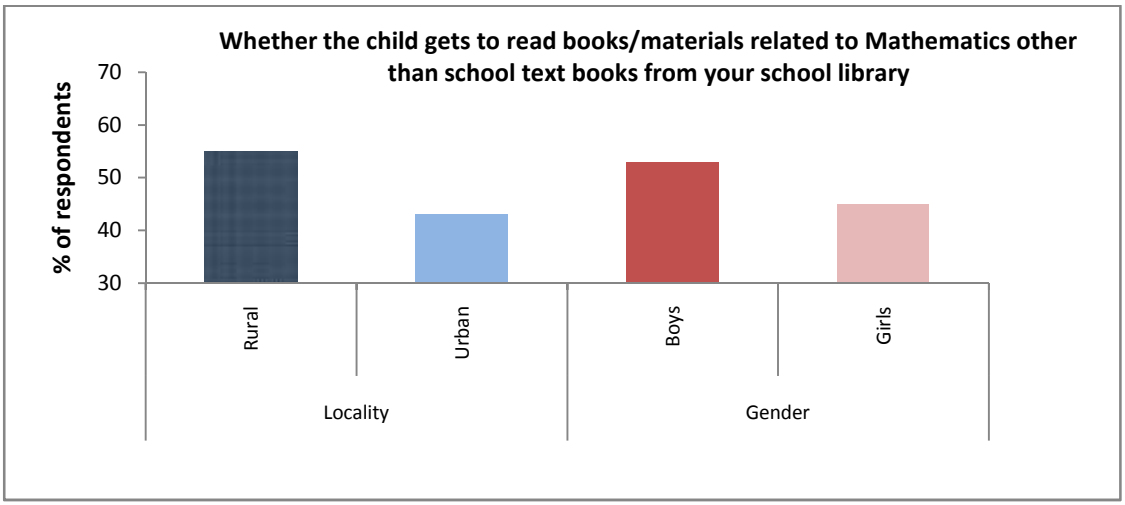
3.3.8 Reading books/materials related to Mathematics other than school text books

According to 55% of rural students, 43% of urban students, 53% of boys and 45% of girls, they get to read books/materials related to Mathematics other than school text books from the school library.

Table – 3.23: Reading books/materials related to Mathematics other than school text books

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child gets to read books/materials related to Mathematics other than school text books from your school library	55	43	53	45

Fig. 3.22: Reading books/materials related to Mathematics other than school text books



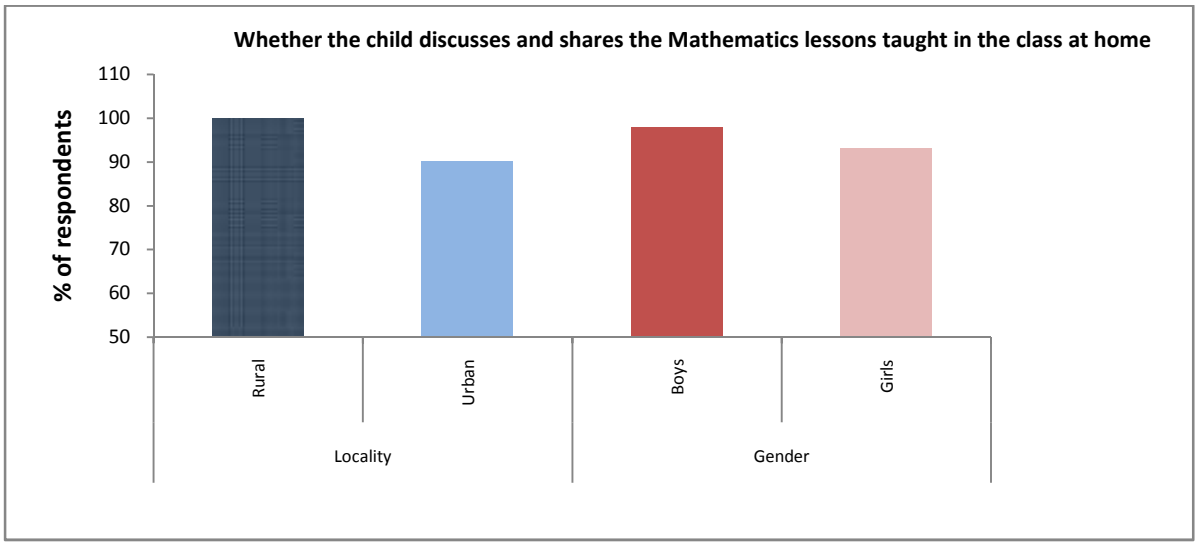
3.3.9 Discussing and sharing the Mathematics lessons taught in the class at home

All rural students, 90% of urban students, 98% of boys and 93% girls state that they discuss and share at home the Mathematics lessons taught in the class.

Table – 3.24: Discussing and sharing the Mathematics lessons taught in the class at home

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child discusses and shares the Mathematics lessons taught in the class at home	100	90	98	93

Fig. 3.23: Discussing and sharing the Mathematics lessons taught in the class at home



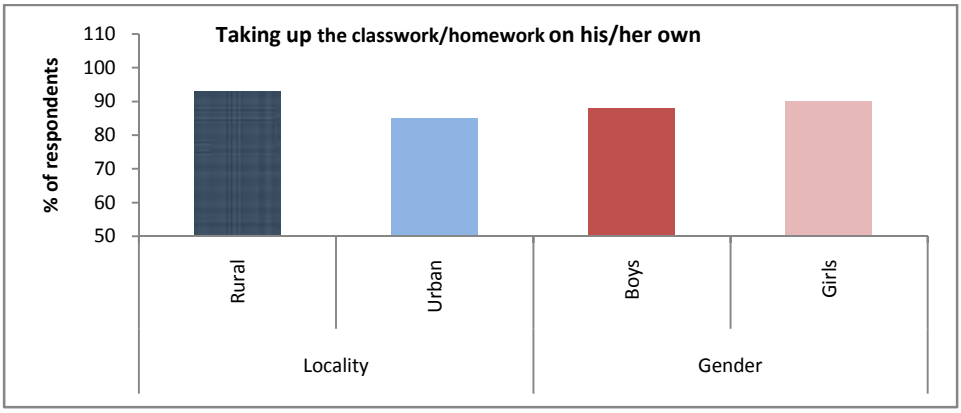
3.3.10 Taking up the classwork/ homework on his/her own

When the students were asked whether they can take up on their own the classwork/homework on the Mathematics lesson taught in the class, 93% rural students, 85% of urban students, 88% of boys and 90% of girls answered in the affirmative.

Table – 3.25: Taking up the classwork/ homework on his/her own

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child can take up on his/her own the classwork/homework on the Mathematics lesson taught in the class	93	85	88	90

Fig. 3.24: Taking up the classwork/ homework on his/her own



3.3.11 Use of ICT by the school in teaching Mathematics

Only 10% of rural students, 20% of urban students, 13% of boys and 18% of girls say that the schools use ICT in teaching Mathematics.

Table – 3.26: Use of ICT by the school in teaching Mathematics

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the school uses ICT in teaching Mathematics	10	20	13	18

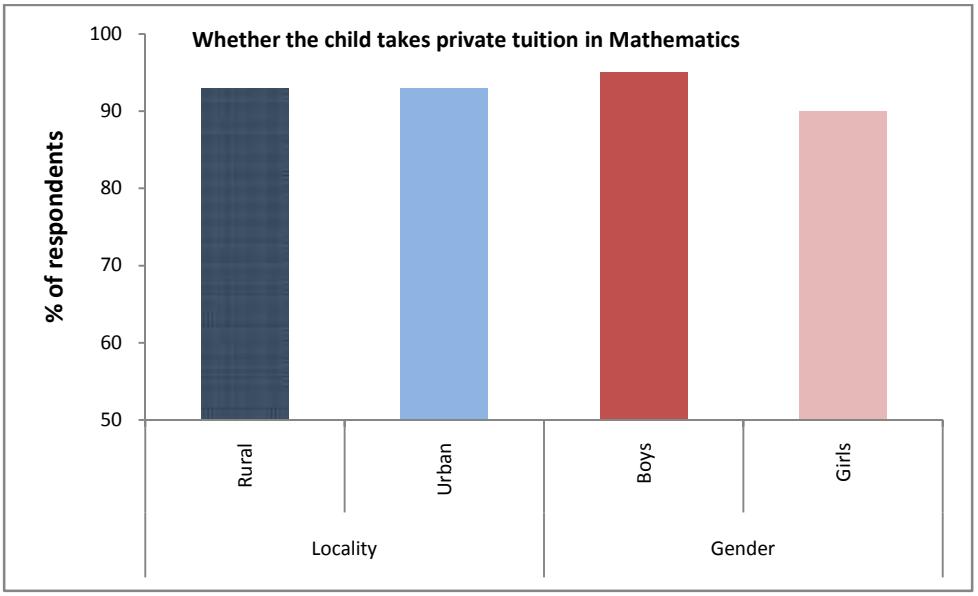
3.3.12 Whether the child takes private tuition in Mathematics

93% each of rural and urban students, 95% of boys and 90% of girls state that they take private tuition in Mathematics.

Table – 3.27: Whether the child takes private tuition in Mathematics

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child takes private tuition in Mathematics	93	93	95	90

Fig. 3.25: Whether the child takes private tuition in Mathematics



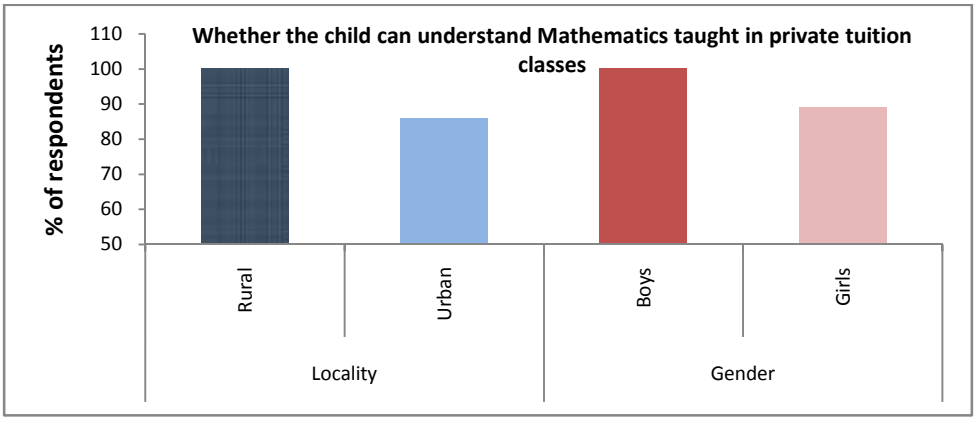
3.3.13 Whether the child can understand Mathematics taught in private tuition classes

All rural students and boys, 86% of urban students and 89% of girls say that they can understand Mathematics taught in private tuition classes.

Table – 3.28: Whether the child can understand Mathematics taught in private tuition classes

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child can understand Mathematics taught in private tuition classes	100	86	100	89

Fig. 3.26: Whether the child can understand Mathematics taught in private tuition classes



3.3.14 Attending free classes

Only 3% of urban students and 3% of girls say that they get the opportunity to attend free classes organized by local clubs or any other organization.

Table – 3.29: Attending free classes

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child gets the opportunity to attend free classes organized by local clubs or any other organization	0	3	0	3

3.3.15 Performance in Mathematics

When the performance in Mathematics in school examinations was taken into consideration, it is seen that the performance of 33 -49% students is average (35 – 59%). Good performance (60 – 80%) is shown by 13 - 35% of the students. 15% of the students show very good result (above 80%) and the performance of 3 - 25% of the students is poor (less than 35%). Poor performance is shown by only 3% of rural students. 23% girls have given very good result.

Table – 3.30: Performance in Mathematics

Performance	Percentage of respondents			
	Rural	Urban	Boys	Girls
Poor (less than 35%)	3	25	13	15
Average (35 – 59%)	44	37	33	49
Good (60 – 80%)	35	25	47	13
Very good (above 80%)	18	13	8	23

Fig. 3.27 (A): Performance in Mathematics of Rural and Urban students

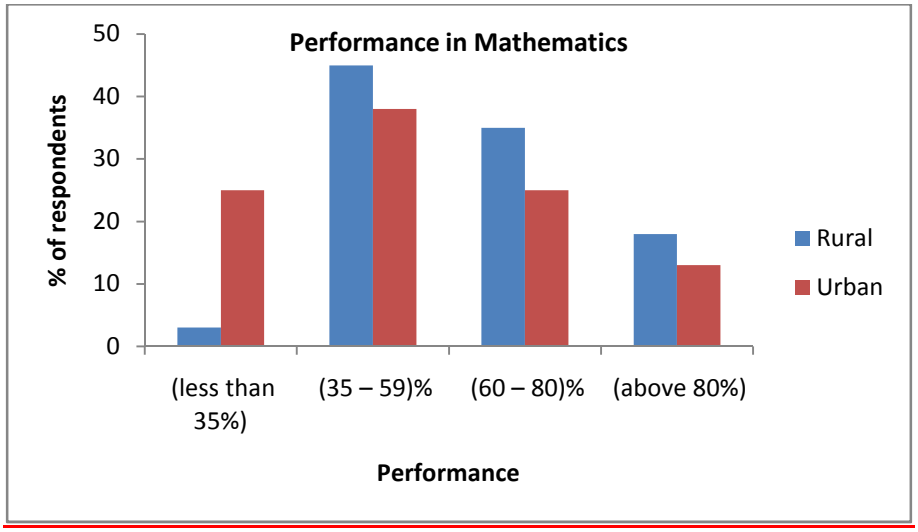
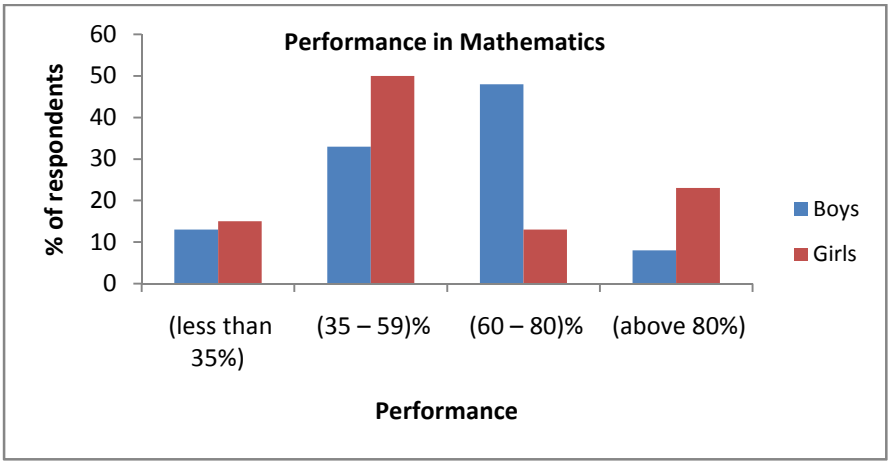


Fig. 3.27 (B): Performance in Mathematics of Boys and Girls



3.3.16 Completion of assignments in time

85% of both rural and urban students, 95% of boys and 75% of girls say they are able to complete the assignments given in the class within time.

Table – 3.31: Completion of assignments in time

Issue	Percentage of respondents			
	Rural	Urban	Boys	Girls
Whether the child is able to complete the assignments given in the class within time	85	85	95	75

3.3.17 Help in doing Mathematics assignments at home

As for getting help in doing Mathematics assignments at home, older siblings help 35 to 53% of the students and 33 to 43% students are helped by their private tutors. Mothers assist 16.25% and 5 to 28% of the respondents and fathers help 13 to 18% of the students in completing Mathematics assignments at home. However, 13 to 38% of the students say that they are helped by no one in doing the task at home.

Of the rural students, 53% are helped by older siblings and 43% by private tutors. 38% of urban students are not helped by anyone and 35% are helped by older siblings. Private tutors help 38% boys and older siblings help 35% of the boys. 53% of the girls are helped by older siblings, 33% are helped by private tutor and no one at home helps 33 % of the girls in completing Mathematics assignments at home.

Table – 3.32: Help in doing Mathematics assignments at home

Helped at home by	Percentage of respondents			
	Rural	Urban	Boys	Girls
Father	13	18	18	13
Mother	13	20	28	5
Older siblings	53	35	35	53
Other family members	15	3	5	13
Private Tutor	43	28	38	33
No one	13	38	18	33

Fig. 3.28 (A): Help in doing Mathematics assignments at home

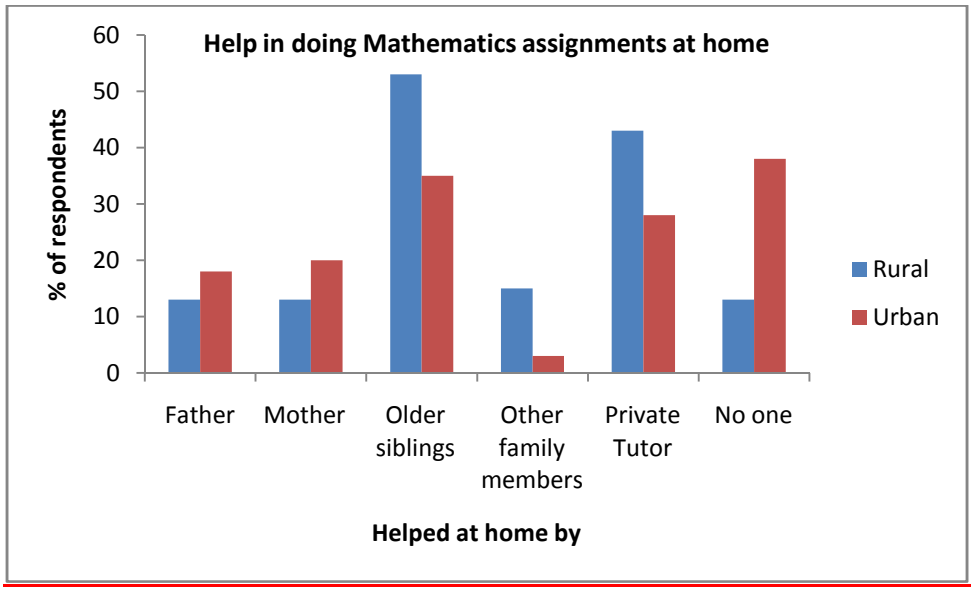
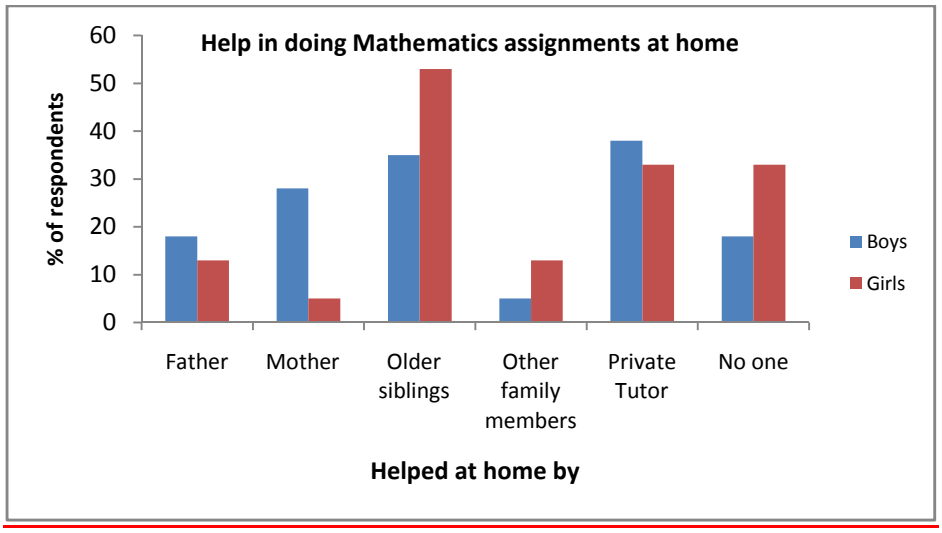


Fig. 3.28 (B): Help in doing Mathematics assignments at home



3.3.18 Learning Mathematics when the school was closed during pandemic

Almost all the students took help of private tutors in learning Mathematics at home although the schools conducted online Mathematics classes for class 8.

3.4 ANALYSIS OF GUARDIANS' RESPPONSES

The study involved 40 guardians of the students from the selected 4 schools.

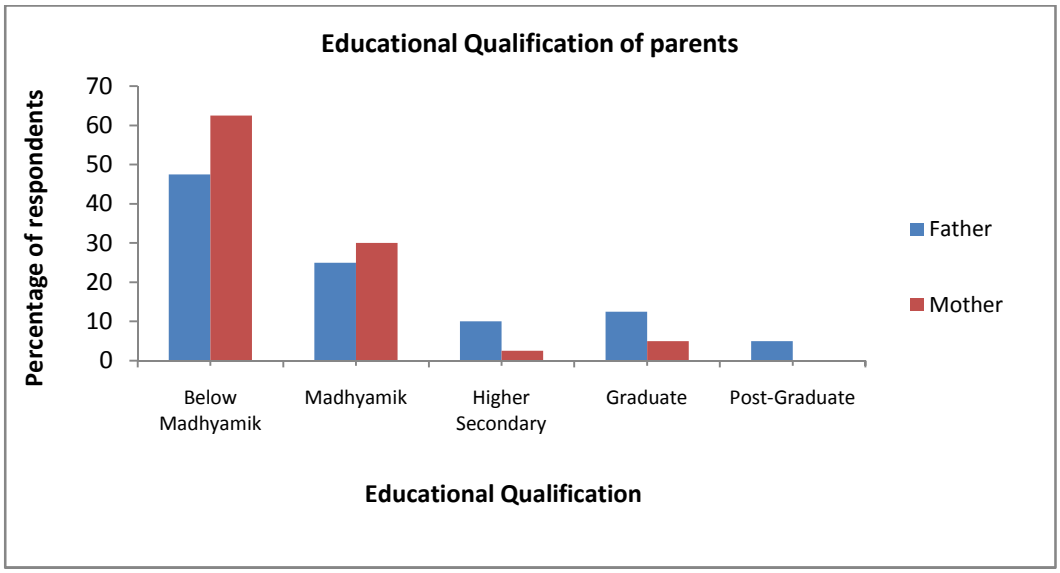
3.4.1 Educational Qualification of parents

As is evident from the table below, the educational qualification of most of the parents is Madhyamik or below Madhyamik (72.5% for fathers and 92.5% for mothers).

Table – 3.33: Educational Qualification of parents

Educational Qualification	Percentage of respondents	
	Father	Mother
Below Madhyamik	47.5	62.5
Madhyamik	25	30
Higher Secondary	10	2.5
Graduate	12.5	5
Postgraduate	5	0

Fig. 3.29: Educational Qualification of parents



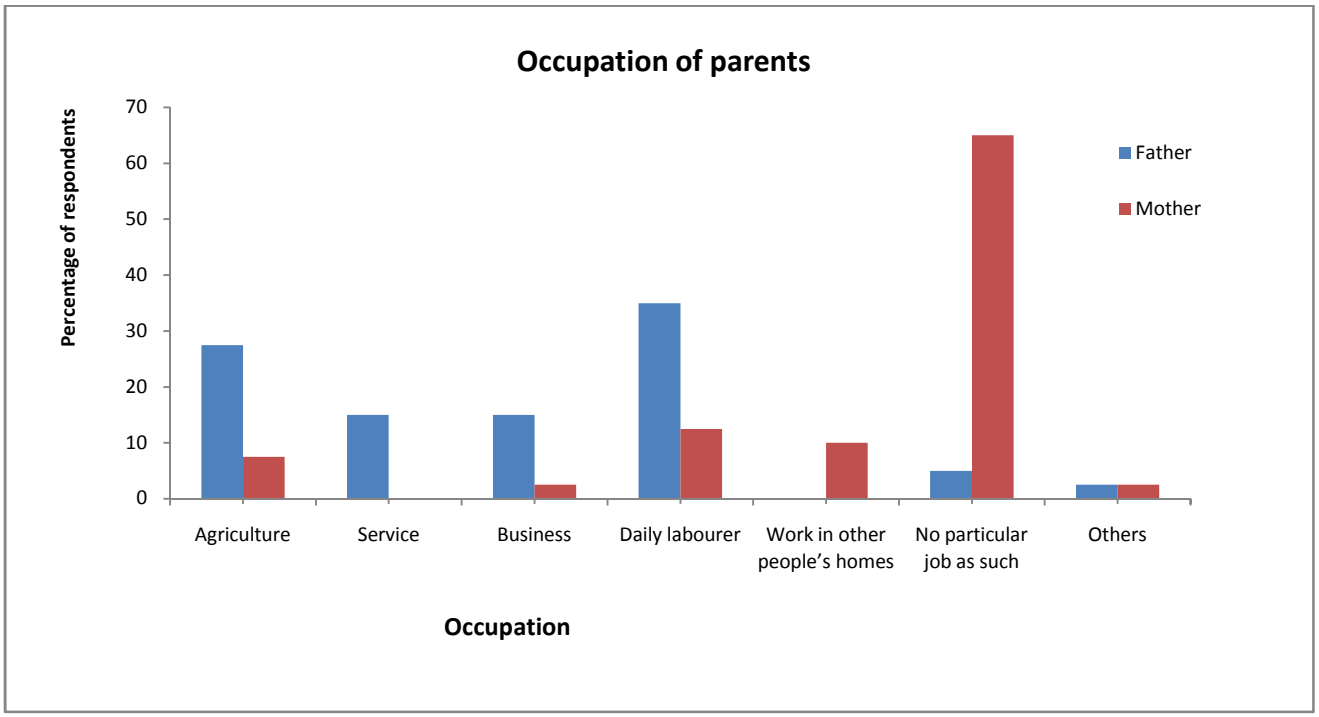
3.4.2 Occupation of parents

The table given below shows that the primary occupations of the fathers are agriculture (27.5%) and working as daily labourers (35%). The mothers generally are either not engaged in any occupation (65%) or are engaged as daily labourers (12.5%).

Table – 3.34: Occupation of parents

Occupation	Percentage of respondents	
	Father	Mother
Agriculture	27.5	7.5
Service	15	0
Business	15	2.5
Daily labourer	35	12.5
Work in other people's homes	0	10
No particular job as such	5	65
Others	2.5	2.5

Fig. 3.30: Occupation of parents



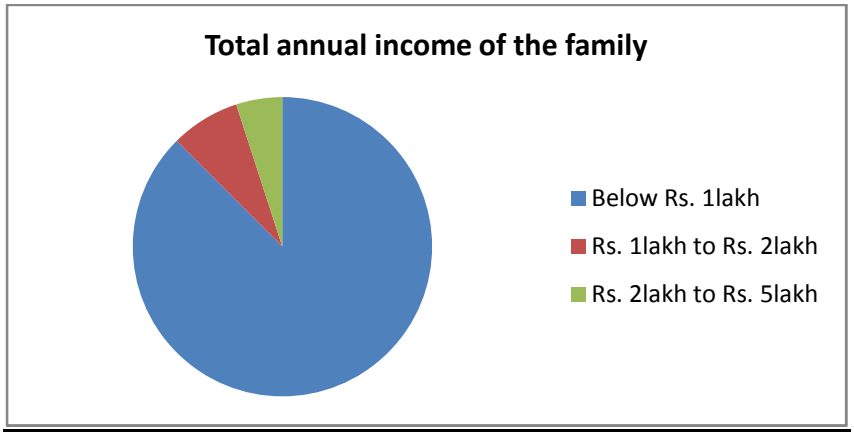
3.4.3 Total annual income of the family

The total annual family income of most of the respondents (87.5%) is below Rs. 1 lakh. It is not above Rs. 5 lakh for any of the respondents.

Table – 3.35: Total annual income of the family

Total annual income of the family	Percentage of respondents
Below Rs. 1lakh	87.5
Rs. 1lakh to Rs. 2lakh	7.5
Rs. 2lakh to Rs. 5lakh	5

Fig. 3.31: Total annual income of the family



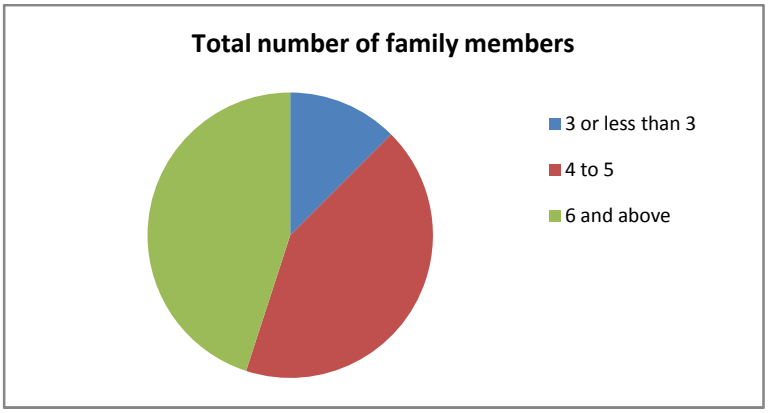
3.4.4 Total number of family members

The number of family members is more than 6 for 45% of the respondents, 4 to 5 for 42.5% of the respondents and 3 or less than 3 in case of 12.5% of the guardians.

Table – 3.36: Total number of family members

Total number of family members	Percentage of respondents
3 or less than 3	12.5
4 to 5	42.5
6 and above	45

Fig. 3.32: Total number of family members



3.4.5 Availability of Digital Devices

65% of the respondents say that digital devices are available with them.

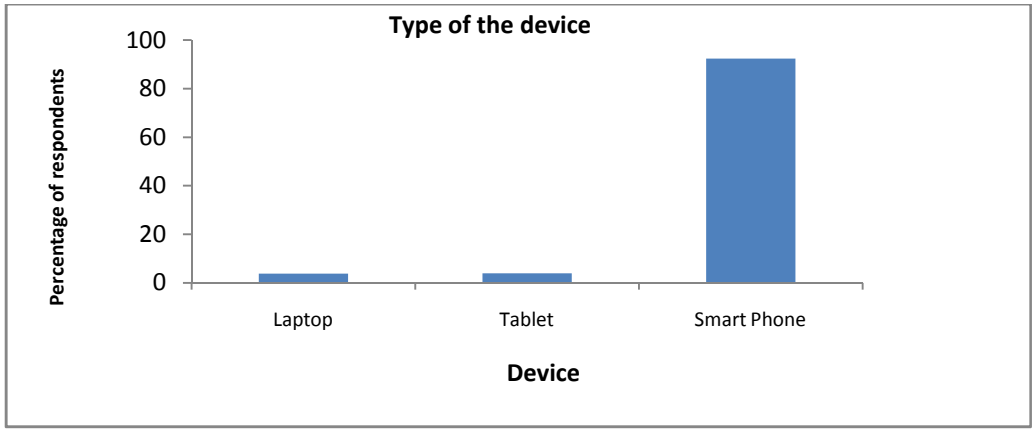
3.4.6 Type of the device available in the families having digital devices

92.3% of the respondents have smart phones available in the family.

Table – 3.37: Type of the device available in the families having digital devices

Type of electronic device available in the family	Percentage of respondents
Laptop	3.8
Tablet	3.9
Smart phone	92.3

Fig. 3.33: Type of the device available in the families having digital devices



3.4.7 Having internet facility at home

67.5% of the guardians say that they have internet facility at home.

3.4.8 Having at home a device specific for the child's studies

Of the families that have digital devices available with them, 27.5% of the respondents state that at home they have a device specific for the child's studies.

3.4.9 Completion of Mathematics assignments in time

95% of the guardians say that the child is able to complete all mathematics home and class assignments in time.

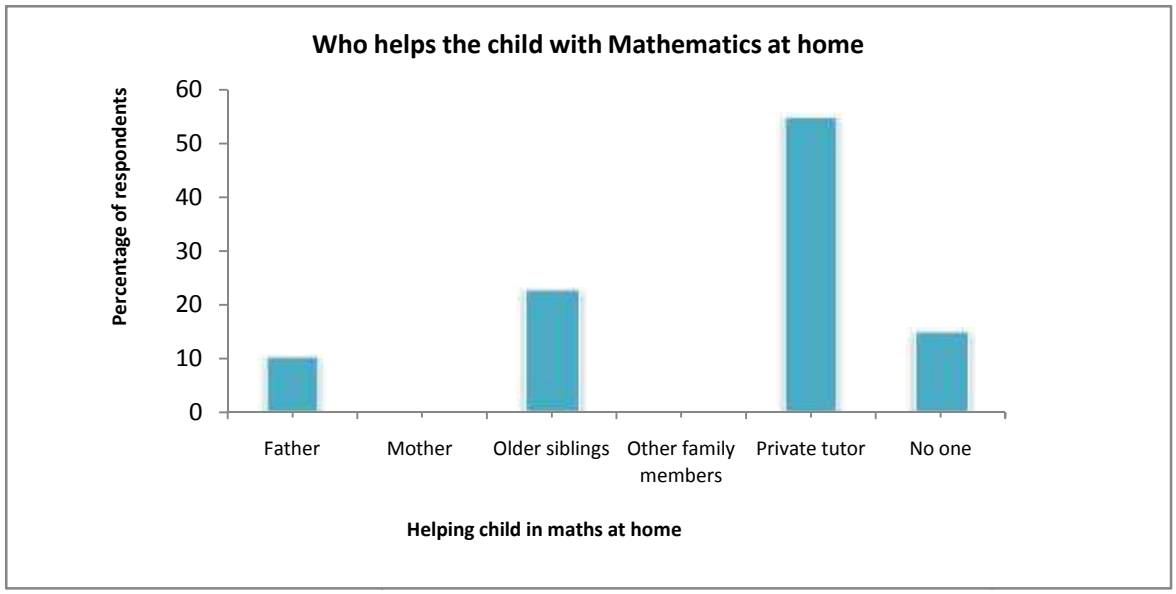
3.4.10 Who helps the child with Mathematics at home

When asked who helps the child with Mathematics at home, 55% of the respondents say that private tutors help the children. Mothers and other family members do not help in the task. The father and older siblings help in 10% and 22.5% of the cases respectively. 15% of the respondents say that no one is there to help the child with Mathematics at home.

Table – 3.38: Who helps the child with Mathematics at home

Who helps the child with Mathematics at home	Percentage of respondents
Father	10
Mother	0
Older siblings	22.5
Other family members	0
Private tutor	55
No one	15

Fig. 3.34: Who helps the child with Mathematics at home



3.4.11 Whether the child likes Mathematics and whether the child practices Mathematics regularly

The children like Mathematics according to 82.5% of the respondents. 85% of the respondents say that the children practice Mathematics regularly.

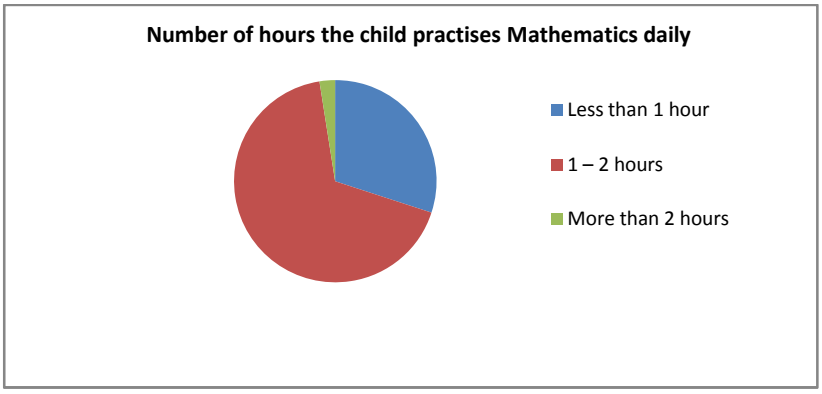
3.4.12 Number of hours the child practises Mathematics daily

For the children who practise Mathematics daily, 73.5% of the respondents say that the children do so for 1 to 2 hours daily. For 23.5% of the respondents, the children do sums daily for less than an hour. Only 2.9% of the guardians state that their children work on Mathematics daily for more than 2 hours.

Table – 3.39: Number of hours the child practises Mathematics daily

Number of hours	Percentage of respondents
Less than 1 hour	23.6
1 – 2 hours	73.5
More than 2 hours	2.9

Fig. 3.35: Number of hours the child practises Mathematics daily



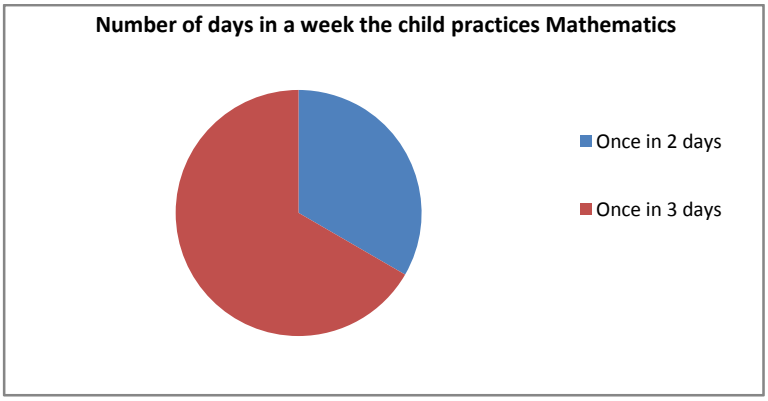
3.4.13 Number of days in a week the child practices Mathematics (if not practicing daily)

In the cases where the child does not do sums daily, 66.7% of the respondents say that the children practise Mathematics once in 3 days. According to 33.3% of the guardians, their children work on Mathematics once in 2 days.

Table – 3.40: Number of days in a week the child practices Mathematics

Number of days in a week the child practices Mathematics	Percentage of respondents
Once in 2 days	33.3
Once in 3 days	66.7

Fig. 3.36: Number of days in a week the child practices Mathematics



3.5 MATRIX FOR MATCHING TESTED LEARNING OUTCOMES WITH TEXTBOOKS

A detailed study of the tested LOs was carried out by practicing Mathematics teachers who teach class 8. The table given below shows the class in which a particular LO can be found. The reference is textbooks used in the Government/ Government sponsored / aided schools of West Bengal.

Table – 3.41: Overall matching of tested LOs

SL. No.	Learning Outcome Code	Learning Outcomes (Mathematics)	Mathematics Syllabus of class with which the Learning Outcome matches			State Average Performance	National Average Performance
			6	7	8		
1	M60l	Solves problems involving large numbers by applying appropriate operations.	✓	×	×	52	49
2	M606	Solves problems on daily life situations involving addition and subtraction of fractions/decimals.	×	×	×	50	48
3	M620	Finds out the perimeter and area of rectangular objects in the surroundings like floor of the classroom, surfaces of a chalk box etc.	×	✓	×	31	29
4	M62l	Arranges given/collected information in the form of table, pictograph and bar graph and interprets them.	✓	✓	✓	42	41
5	M702	Interprets the division and multiplication of fractions.	✓	×	×	37	34
6	M705	Solves problems related to daily life situations involving rational numbers	✓	✓	✓	26	23
7	M706	Uses exponential form of numbers to simplify problems involving multiplication and division of large numbers.	×	✓	×	25	28
8	M707	Adds/subtracts algebraic expressions	×	✓	×	42	38
9	M7l0	Solves problems related to conversion of percentage to fraction and decimal and vice versa	✓	×	✓	33	30
10	M717	Finds out approximate area of closed shapes by using unit square grid/graph sheet	✓	×	×	35	34
11	M719	Finds various representative values for simple data from her/his daily life contexts like mean, median and mode.	×	×	×	42	43
12	M721	Interprets data using bar graph such as consumption of electricity is more in winters than summer.	×	✓	✓	37	37
13	M801	Generalizes properties of addition, subtraction, multiplication and division of rational numbers through patterns	×	×	✓	33	34

14	M802	Finds rational numbers between two given rational numbers	×	×	✓	39	40
15	M803	Proves divisibility rules of 2, 3, 4,5,6,9 and 11	×	×	×	42	43
16	M804	Finds squares, cubes, square roots and cube roots of numbers using different methods	✓	✓	✓	34	34
17	M808	Uses various algebraic identities in solving problems of daily life.	×	✓	✓	48	42
18	M812	Verifies properties of parallelogram and establishes the relationship between them through reasoning.	×	✓	✓	41	39
19	M818	Find surface area and volume of cuboidal and cylindrical object	×	×	×	29	30
20	M819	Draws and interprets bar charts and pie charts	×	×	✓	29	30

Below is given a more detailed analysis of the matching. The table given below shows the class and chapter in which a particular LO can be found and to what extent.

Table – 3.42: Detailed analysis of matching of tested LOs

<table>
<tr><th>No</th><th>Code</th><th>Remarks</th></tr>
<tr><td>1.</td><td>M601</td><td>There is examples-5 & Exercise-9 in class VI book and more problems are given in class V book</td></tr>
<tr><td>2.</td><td>M606</td><td>Not in classes VI,VII,VIII, but given in previous classes</td></tr>
<tr><td>3.</td><td>M620</td><td>Enough examples (10) & and Exercises (30) are given in class VII book</td></tr>
<tr><td>4.</td><td>M621</td><td><table><tr><td>Class</td><td>Examples</td><td>Exercise</td></tr><tr><td>VI</td><td>7</td><td>8</td></tr><tr><td>VII</td><td>4</td><td>8</td></tr><tr><td>VIII</td><td>2</td><td>2</td></tr></table></td></tr>
<tr><td>5.</td><td>M702</td><td>Briefly elaborated in chapter 6 of class VI book</td></tr>
<tr><td>6.</td><td>M705</td><td>There are many examples related to daily life situations involving rational numbers<table><tr><td>Class VI</td><td>(Chapter- 2,6,7,8,9,12,18,19,21)</td></tr><tr><td>Class VII</td><td>(Chapter- 2,3,10,11,15,17)</td></tr><tr><td>Class VIII</td><td>(Chapter- 10,11,12,17)</td></tr></table></td></tr>
<tr><td>7.</td><td>M706</td><td>Elaborately discussed in chapter 5 of class VII book</td></tr>
<tr><td>8.</td><td>M707</td><td>Elaborately discussed in chapter 6 of class VII book</td></tr>
<tr><td>9.</td><td>M710</td><td>Enough examples and exercises are given chapter 9 of class VI book and hard problems and examples are given in class VIII book</td></tr>
<tr><td>10.</td><td>M717</td><td>Not in large scale just an example is given(page-157)</td></tr>
<tr><td>11.</td><td>M719</td><td>Topics in Mean, Median and Mode primarily start from class IX</td></tr>
<tr><td>12.</td><td>M721</td><td>Elaborately explained in class VII chapter 16 and one example is given in chapter 2 of class VIII</td></tr>
<tr><td>13.</td><td>M801</td><td>Explained in chapter 3 of class VIII book</td></tr>
</table>

<table>
<tr><td>14.</td><td>M802</td><td>Procedure and problems are given in chapter 3 of class VIII book</td></tr>
<tr><td>15.</td><td>M803</td><td>Not given in classes VI,VII and VIII. Just preliminary ideas of divisibility rule (2,3,5) are given in previous classes.</td></tr>
<tr><td>16.</td><td>M804</td><td><table><tr><th>Class</th><th></th></tr><tr><td>VI</td><td>Squares of whole numbers and square roots of whole numbers are given in chapter 18 of class VI</td></tr><tr><td>VII</td><td>Square and Square roots of fractions are given in chapter 11 of class VII</td></tr><tr><td>VIII</td><td>Cube and Cube roots of numbers are given in chapter 5 of class VIII</td></tr></table></td></tr>
<tr><td>17.</td><td>M808</td><td>There is general problems in books of class VII and VIII but there is no practical problems related this.</td></tr>
<tr><td>18.</td><td>M812</td><td>Only properties of parallelograms are given in chapter 20 of class VII book.</td></tr>
<tr><td>19.</td><td>M818</td><td>Surface area and volume of 3D figures starts from class X</td></tr>
<tr><td>20.</td><td>M819</td><td>Explained in chapter 2 of class VIII book</td></tr>
</table>

CHAPTER 4

MAJOR FINDINGS OF THE STUDY

The major findings of the present study are summarised in the following pages. This would help a reader to understand the findings at a glance.

4.1 GENERAL INFORMATION

I. For the present study-

- Number of schools – 4
- Number of Head of the Institutions – 4
- Number of teachers – 8
- Number of parents / guardians – 40
- Number of students – 80

II. To identify the reasons for low achievement in Mathematics of class 8 students, questionnaires for four target groups were designed involving experts. The target groups were –

i) Heads of the Institutions (HoI)
ii) 2 teachers teaching Mathematics in class 8
iii) Students of class 8
iv) Parents / Guardians of students of class 8

Additionally, a matrix for matching of the tested Learning Outcomes with the textbooks of class 8 used in the Government/ Government sponsored / aided schools of West Bengal was also designed for the present study.

Headmasters' Responses

- All the respondents said that the question papers for evaluation are developed by subject teachers of the school.
- 75% of the respondents are of the opinion that capacity building of the subject teachers in designing assessment tool/question paper is necessary for effectively assessing the attainment of Learning Outcomes by the students. On the other hand, 25% of the respondents feel that use of standardised test material from central repository would serve the purpose.
- All the respondents agreed that availability of infrastructural facilities is the greatest challenge in school management. The other major challenges are large class size, classroom management by teachers and being overburdened with other responsibilities. Allocation of resources, absenteeism of students and absenteeism of teachers also impose hurdles in the way of school management. No subject specific orientation to the teachers and outside school disturbances too are some of the minor challenges.
- During the pandemic, online teaching was organized for classes 9 and 10 only. Moreover, class 8 was taught mainly through formation of WhatsApp groups.

- Half of the respondents organized capacity building programmes for the teachers to facilitate online teaching.
- Orientation of parents and students was taken up to convince them about the importance of online teaching learning during the pandemic.
- Special and individual care was taken of the students. Help of bridge course books was taken, and students were motivated to come back to the school.

Teachers' Responses

- 87.5% of the respondents are postgraduates while 12.5% are graduates. None of them have M.Phil./Ph.D. degree.
- All the respondents have B. Ed. degree as professional qualification.
- All the Mathematics teachers under the ambit of the study had Mathematics as a subject at the graduation level.
- 75% of the respondents had Mathematics as major (Honours) subject and 25% of the respondents had Mathematics as minor (Pass) subject at the graduation level.
- For 75% of the respondents, Mathematics was the subject at the postgraduate level, and 25 % had another subjects at that level.
- In the last 5 years, 37.5% of the respondents have not attended any training programme as subject teachers, 12.5% have attended 3 or more training programmes, while half of the respondents have attended 1 to 2 training programme(s).
- Half of the respondents said that they are familiar with all the LOs for Mathematics and 37.5% said that they are familiar with some the LOs for Mathematics. The LOs for Mathematics have not been studied by 12.5 % of the respondents.
- Only 12.5 % of the respondents said that they have attended training programme(s) on Learning Outcomes. 2 training programmes on Learning Outcomes were attended by the respondents who said that they had attended such training programme(s).
- According to 75% of the respondents, the extent of alignment of Mathematics textbooks with LOs is high while 12.5% of the respondents say that the extent of alignment is moderate. As for another 12.5% of the respondents, there is very little alignment of Mathematics textbooks with LOs.
- 87.5% of the respondents are of the opinion that the integrated approach adopted in the textbooks caters to the attainment of desirable Learning Outcomes among the students. The remaining 12.5% of the respondents feel that the attainment of desirable Learning Outcomes is only partial.
- The teachers are of the opinion that imparting lesson with real life examples and time to time revision of curriculum and textbooks are the measures that should be taken by teachers to improve achievement of students in Mathematics.
- The Mathematics teachers said that they arranged online classes for the students and provided them with activity based homework.
- 50% of the respondents said that they attended offline (face to face) capacity building programmes on Mathematics teaching, while capacity building programmes on online Mathematics teaching was attended by 75% of the respondents.
- The strategies adopted after re-opening of the school to compensate for the learning loss

incurred in Mathematics due to school closure during the pandemic include taking help of bridge course books, holding of revision classes and helping students who need special care in Mathematics.

Students' Responses

- All rural students and 75% of the urban students say that they enjoy the Mathematic classes. Taking the gender of the students into consideration, 95% of the boys and 80% of the girls say that Mathematics classes are enjoyed by them.
- For a very few Mathematics is an interesting subject, but for most the interest is there as it is a fundamental subject. Some students say that the school teacher plays a vital role in making the subject interesting to the students.
- Some students have Mathematics phobia and others simply dislike the subject as they find it difficult.
- 90% of rural students and 80% of urban students, 78% boys and 93% girls say that the language spoken at home is the same as the language spoken by the teacher in school.
- All rural students and all girls say that they can comprehend the language that the teacher uses in the class. For urban students and boys, this is true for 95% students each.
- As for connecting the Mathematics lesson taught in the class with real life experience, 85% and 68% of rural and urban students respectively, and 73% boys and 80% girls answered in the affirmative.
- 97% of rural students, 95% each of urban students and boys and 95% of girls say that they regularly participate in the activities conducted in the Mathematics class.
- Questions are regularly asked in the Mathematics class by 77% of rural students, 65% each of urban students and girls and 78% boys.
- 58% of rural students, 70% of urban students, 75% of boys and 53% of girls state that they work in groups while participating in various activities of Mathematics.
- According to 55% of rural students, 43% of urban students, 53% of boys and 45% of girls, they get to read books/materials related to Mathematics other than school text books from the school library.
- All rural students, 90% of urban students, 98% of boys and 93% girls state that they discuss and share at home the Mathematics lessons taught in the class.
- When the students were asked whether they can take up on their own the classwork/homework on the Mathematics lesson taught in the class, 93% rural students, 85% of urban students, 88% of boys and 90% of girls answered in the affirmative.
- Only 10% of rural students, 20% of urban students, 13% of boys and 18% of girls say that the schools use ICT in teaching Mathematics.
- 93% each of rural and urban students, 95% of boys and 90% of girls state that they take private tuition in Mathematics.
- All rural students and boys, 86% of urban students and 89% of girls say that they can understand Mathematics taught in private tuition classes.
- Only 3% of urban students and 3% of girls say that they get the opportunity to attend free classes organized by local clubs or any other organization.
- When the performance in Mathematics in school examinations was taken into consideration, it is seen that the performance of 33 -49% students is average (35 – 59%). Good performance

(60 – 80%) is shown by 13 - 35% of the students. 15% of the students show very good result (above 80%) and the performance of 3 - 25% of the students is poor (less than 35%). Poor performance is shown by only 3% of rural students. 23% girls have given very good result.

- 85% of both rural and urban students, 95% of boys and 75% of girls say they are able to complete the assignments given in the class within time.
- As for getting help in doing Mathematics assignments at home, older siblings help 35 to 53% of the students and 33 to 43% students are helped by their private tutors. Mothers assist 16.25% and 5 to 28% of the respondents and fathers help 13 to 18% of the students in completing Mathematics assignments at home. However, 13 to 38% of the students say that they are helped by no one in doing the task at home.

  Of the rural students, 53% are helped by older siblings and 43% by private tutors. 38% of urban students are not helped by anyone and 35% are helped by older siblings. Private tutors help 38% boys and older siblings help 35% of the boys. 53% of the girls are helped by older siblings, 33% are helped by private tutor and no one at home helps 33 % of the girls in completing Mathematics assignments at home.
- Almost all the students took help of private tutors in learning Mathematics at home although the schools conducted online Mathematics classes for class 8.

Guardians' Responses

- The educational qualification of most of the parents is Madhyamik or below Madhyamik (72.5% for fathers and 92.5% for mothers).
- The primary occupations of the fathers are agriculture (27.5%) and working as daily labourers (35%). The mothers generally are either not engaged in any occupation (65%) or are engaged as daily labourers (12.5%).
- The total annual family income of most of the respondents (87.5%) is below Rs. 1 lakh. It is not above Rs. 5 lakh for any of the respondents.
- The number of family members is more than 6 for 45% of the respondents, 4 to 5 for 42.5% of the respondents and 3 or less than 3 in case of 12.5% of the guardians.
- 65% of the respondents say that digital devices are available with them.
- 92.3% of the respondents have smart phones available in the family.
- 67.5% of the guardians say that they have internet facility at home.
- Of the families that have digital devices available with them, 27.5% of the respondents state that at home they have a device specific for the child's studies.
- 95% of the guardians say that the child is able to complete all mathematics home and class assignments in time.
- When asked who helps the child with Mathematics at home, 55% of the respondents say that private tutors help the children. Mothers and other family members do not help in the task. The father and older siblings help in 10% and 22.5% of the cases respectively. 15% of the respondents say that no one is there to help the child with Mathematics at home.
- The children like Mathematics according to 82.5% of the respondents. 85% of the respondents say that the children practice Mathematics regularly.
- For the children who practise Mathematics daily, 73.5% of the respondents say that the children do so for 1 to 2 hours daily. For 23.5% of the respondents, the children do sums daily for less than an hour. Only 2.9% of the guardians state that their children work on Mathematics daily for more than 2 hours.

- In the cases where the child does not do sums daily, 66.7% of the respondents say that the children practise Mathematics once in 3 days. According to 33.3% of the guardians, their children work on Mathematics once in 2 days.

CHAPTER 5

CONCLUSIONS & LIMITATIONS OF THE STUDY

5.1 Conclusions

The summary of the findings are –

- Rural students enjoy the Mathematics classes more than the urban students. Mathematics classes are enjoyed more by boys than by girls.
- Questions are regularly asked in the Mathematics classes more by rural students and by boys.
- Working in groups while participating in various activities of Mathematics has to be increased for everyone, especially for rural students and girls.
- Poor performance (less than 35%) in school examinations is shown by a greater percentage of urban students (25%). Highest percentage of girls (49%) show average performance (35 – 59%). Good performance (60 – 80%) is given by maximum boys (47%) while very good performance (above 80%) is given by 23% girls.
- For a very few students, Mathematics is an interesting subject, but for most the interest is there as it is a fundamental subject. Some students say that the school teacher plays a vital role in making the subject interesting to the students.
- Some students have Mathematics phobia and others simply dislike the subject as they find it difficult.
- The educational qualification of most of the parents is Madhyamik or below Madhyamik.
- The total annual family income of most of the respondents (87.5%) is below Rs. 1 lakh.
- Digital devices are available with 65% of the respondents.
- Only about one third of the families that have digital devices available with them, they have a device specific for the child's studies at home.
- Only 2.9% of the guardians state that their children work on Mathematics daily for more than 2 hours.
- In the cases where the child does not do sums daily, 66.7% of the respondents say that the children practise Mathematics once in 3 days.
- Online teaching was organized for classes 9 and 10 only. Class 8 was taught mainly through formation of WhatsApp groups.
- Greater number of capacity building programmes needs to be organized for the teachers to facilitate online teaching.
- More training programmes on Learning Outcomes are required.
- The teachers are of the opinion that imparting lesson with real life examples and time to time revision of curriculum and textbooks are the measures that should be taken by teachers to improve achievement of students in Mathematics.
- Greater alignment of textbooks is necessary for attainment of desired Learning Outcomes by the learners.

5.2 Limitations

Due to fund, time and manpower constraints, only class 8 students of 4 schools (2 urban and 2 rural) from one (1) district, Purulia, were selected.

Only simple quantitative data analysis involving percentage was used to arrive at the conclusions. The study would have been strengthened by a qualitative approach using interview schedules, case studies, etc. This, however, would require more time, funds and well trained personnel.

ANNEXURES

SQ

SURVEY TOOL

FOR

A STUDY ON "REASONS FOR LOW PERFORMANCE IN MATHEMATICS OF CLASS VIII STUDENTS IN PURULIA DISTRICT OF WEST BENGAL"

Government of West Bengal

DEPARTMENT OF SCHOOL EDUCATION

STATE COUNCIL OF EDUCATIONAL RESEARCH & TRAINING

25/3, Ballygunge Circular Road, Kolkata - 700019

SCHOOL QUESTIONNAIRE (SQ)

(To be filled in by the Head Teacher)

STATE: WEST BENGAL

District: …….. Date of Survey…….

[Please put a tick "✓" in the appropriate box]

A. GENERAL INFORMATION:

1. Name of the School: _____
2. Address of the School:_____

   _____
3. a) Contact Number : _____

   b) e-mail: _____
4. (a) Category of the School:

   Upper Primary ☐ Secondary ☐ H.S ☐

   (b) Location of the School: Urban Municipality ☐ Rural ☐
5. Total number of students enrolled in Class 8 of your School:

   Boys ☐ Girls ☐ Total ☐
6. Number of Teachers: ☐ Sanctioned posts ☐

INFORMATION ON TEACHING-LEARNING PROCESS:

1. Are you familiar with the document on Learning Outcome published by the following organisations?

   NCERT ☐ Any organisation of West Bengal ☐

   Not familiar ☐

2. Are the Learning Outcomes been communicated to the students?

Yes ☐ No ☐

3. Are the Learning Outcomes been communicated to the parents/guardians?

Yes ☐ No ☐

4. Are the Learning Outcomes been shared in the School Management Committee (SMC) meetings?

Yes ☐ No ☐

5. Have your school's activities been affected by shortage or inadequacy of the following? (You can put tick "✓" in more than one option)

a) Instruction materials (e.g. text books, TLM) ☐

b) Subject-specific teaching staff ☐

c) ICT resources for delivery of instruction ☐

d) Any other (please specify) …….

6. a) i) Are the questions papers for evaluation developed by subject teachers of the school?

Yes ☐ No ☐

ii) Are questions papers procured from external sources? Yes ☐ No ☐

b) To what extent, in your opinion, can such question papers effectively assess the attainments of learning outcomes?

Very well ☐ Moderately ☐ Not much ☐

7. i) In your opinion what is required for effectively assessing the attainment of Learning Outcomes by the students –

(a) Capacity building of the subject teachers in designing assessment tool/question paper ☐

(b) Using standardised test material from central repository ☐

8. What are the challenge(s) in the school management as perceived by you-

a) Infrastructural facilities YES ☐ NO ☐

b) Allocation of resources YES ☐ NO ☐

c) Large Class size YES ☐ NO ☐

d) Classroom Management by teachers YES ☐ NO ☐

e) Absenteeism of students YES ☐ NO ☐

f) Absenteeism of teachers YES ☐ NO ☐

g) Overburdened with other responsibilities of HoI YES ☐ NO ☐

h) No orientation YES ☐ No ☐

i) Outside school disturbance YES ☐ NO ☐

j) Any other (please specify) ……..

9. What strategies has the school adopted to continue education at the time school closure during the pandemic?

_____
_____
_____
_____

10. Have you organized any capacity building programme for the teachers to facilitate learning teaching in virtual remote format?

Yes ☐ No ☐

If yes, please briefly elaborate:

_____
_____
_____
_____

11. What specific steps have you taken to engage your students in learning process in remote education?

    _____
    _____
    _____
    _____

12. What strategy has your institution adopted after reopening the school to compensate the learning loss incurred due to school closure?

    _____
    _____
    _____
    _____

……	……..	…….
(Name of Head of Institution)	(Mobile No.)	(Signature of Head with date)

……	……..……	….……..
(Name of FI)	(Mobile No.)	(Signature of FI with date)

TQ

SURVEY TOOL

FOR

A STUDY ON "REASONS FOR LOW PERFORMANCE IN MATHEMATICS OF CLASS VIII STUDENTS IN PURULIA DISTRICT OF WEST BENGAL"

Government of West Bengal

DEPARTMENT OF SCHOOL EDUCATION

STATE COUNCIL OF EDUCATIONAL RESEARCH & TRAINING

25/3, Ballygunge Circular Road, Kolkata - 700019

MATHEMATICS TEACHERS' QUESTIONNAIRE (TQ)

STATE: WEST BENGAL

District: …….. Date of Survey…….

[Please put a tick "✓" in the appropriate box]

A. GENERAL INFORMATION:

1. Name: _____

2. Highest Academic Qualifications:

   Graduate ☐ Postgraduate ☐ M.Phil./Ph.D ☐

3. Professional Qualifications (Please specify)]:

   D.El.Ed ☐ B.Ed. ☐ M.Ed. ☐ None ☐

4. Name of the School:_____

5. Location of the school : Urban Municipality ☐ Rural ☐

6. Teaching Experience (in years):

   Below 5 Yrs ☐ 6-10 Yrs ☐ 11-15 Yrs ☐ 16-20 Yrs ☐

   Above 20 Yrs ☐

B. INFORMATION ON TEACHING-LEARNING PROCESS:

1. (a) Did you have Mathematics as a subject at the Graduation level?

Yes ☐ No ☐

(b) If answer to the above is 'Ýes', was Mathematics your major (Honours) subject or minor (Pass) subject?

Major (Honours) ☐ Minor (Pass) ☐

2. Your subject at the Postgraduate level_____

3. Do you teach any subject other than Mathematics in any class?

Subject	Class

4. How many In-service training programmes organized in collaboration with state government agencies have you attended as a subject teacher on the subjects taught by you in the last 5 years?

…… ……

5. a) Do you know about the Learning Outcome document published by the following agencies?

(i) NCERT (2017) Yes ☐ No ☐

(ii) Appropriate State Agency Yes ☐ No ☐

b) Are you conversant with the LOs for Mathematics?

Very few ☐ Some ☐ All ☐ Not studied ☐

c) (i) Have you attended any training programme on Learning Outcomes?

Yes ☐ No ☐

(ii) If answer to the above is "Yes", please give the number of training programmes attended by you ☐

d) To what extent are the contents of the Mathematics textbooks that you transact aligned to help the students attain the desirable Learning Outcomes?

Highly ☐ Moderately ☐ Very little ☐

e) (i)How far does the integrated approach adopted in the textbooks, cater to the attainment of desirable Learning Outcomes among the students?

Fully ☐ Partially ☐ Not at all ☐

(ii) If not, why ……

…….

6. Do you have the resources/supportive environment to implement the following strategies in your classroom?

(i) Classroom discussion Yes ☐ No ☐

(ii) Peer and Group Learning Yes ☐ No ☐

(iii) Integration of TLM in pedagogical processes Yes ☐ No ☐

(iv) Role Play / Simulation Yes ☐ No ☐

(v) Project work Yes ☐ No ☐

(vi) Problem Solving Yes ☐ No ☐

(vii) Hands-on activity Yes ☐ No ☐

(viii) ICT supported activities Yes ☐ No ☐

(ix) Any other (please specify) ……

7. What measures should be taken by teachers to improve achievement of students in Mathematics?

_____
_____
_____
_____

8. What strategies have you adopted to teach Mathematics during school closure in emergency?

_____
_____
_____
_____

9. Did you attend any capacity building programme on Mathematics teaching?

Yes ☐ No ☐

10. Did you attend any capacity building programme on online Mathematics Teaching?

Yes ☐ No ☐

11. What strategies you have adopted after re-opening the school to compensate for the learning loss incurred in Mathematics due to school closure during the pandemic?

_____
_____
_____
_____

Signature of the teacher with date

…… …….…… ……..
(Name of FI) (Mobile No.) (Signature of FI with date)

(Put a tick "✓"in the relevant column)

Alignment of Learning Outcomes tested in NAS 2021 with Class Textbooks of West Bengal

SL. No.	Learning Outcomes Code	Learning Outcomes (Mathematics)	Mathematics Syllabus of class with which the Learning Outcome matches		
			VI	VII	VIII
1	M601	Solves problems involving large numbers by applying appropriate operations.			
2	M606	Solves problems on daily life situations involving addition and subtraction of fractions/decimals.			
3	M620	Finds out the perimeter and area of rectangular objects in the surroundings like floor of the classroom, surfaces of a chalk box etc.			
4	M621	Arranges given/collected information in the form of table, pictograph and bar graph and interprets them.			
5	M702	Interprets the division and multiplication of fractions.			
6	M705	Solves problems related to daily life situations involving rational numbers			
7	M706	Uses exponential form of numbers to simplify problems involving multiplication and division of large numbers.			
8	M707	Adds/subtracts algebraic expressions			
9	M710	Solves problems related to conversion of percentage to fraction and decimal and vice versa			
10	M717	Finds out approximate area of closed shapes by using unit square grid/graph sheet			
11	M719	Finds various representative values for simple data from her/his daily life contexts like mean, median and mode.			
12	M721	Interprets data using bar graph such as consumption of electricity is more in winters than summer.			
13	M801	Generalizes properties of addition, subtraction, multiplication and division of rational numbers through patterns.			
14	M802	Finds rational numbers between two given rational numbers.			
15	M803	Proves divisibility rules of 2, 3, 4,5,6,9 and 11.			
16	M804	Finds squares, cubes, square roots and cube roots of numbers using different methods			
17	M808	Uses various algebraic identities in solving problems of daily life.			
18	M812	Verifies properties of parallelogram and establishes the relationship between them through reasoning.			
19	M818	Find surface area and volume of cuboidal and cylindrical object			
20	M819	Draws and interprets bar charts and pie charts			

SURVEY TOOL

FOR

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Government of West Bengal

DEPARTMENT OF SCHOOL EDUCATION

STATE COUNCIL OF EDUCATIONAL RESEARCH & TRAINING

25/3, Ballygunge Circular Road, Kolkata - 700019

PUPIL QUESTIONNAIRE (PQ)

STATE: WEST BENGAL

District: …….. Date of Survey…….

[Please put a tick "✓" in the appropriate box]

I Name of the student: _____

II Name of the School: _____

III Gender: Boy ☐ Girl ☐ Others ☐

1. Do you enjoy the Mathematics class? Yes ☐ No ☐

   a) If Yes, why? _____
   _____
   _____

   b) If No, why? _____
   _____
   _____

2. Is the language spoken at home the same as the language spoken by the teacher?

   Yes ☐ No ☐

3. Can you comprehend the language that the teacher uses in the class?

   Yes ☐ No ☐

4. Can you connect the Mathematics lesson taught in the class with your real life experience?

   Yes ☐ No ☐

5. Do you regularly participate in the activities conducted in Mathematics class?

Yes ☐ No ☐

6. Do you regularly ask questions in the Mathematics class?

Yes ☐ No ☐

7. Do you get to read books/materials related to Mathematics other than your school text books from your school library?

Yes ☐ No ☐

8. Do you discuss and share the Mathematics lessons taught in the class at home?

Yes ☐ No ☐

9. Can you take up on your own the classwork/homework on the Mathematics lesson taught in the class?

Yes ☐ No ☐

10. Do you work in groups while participating in various activities in Mathematics?

Yes ☐ No ☐

11. Does your school use ICT (computer/projector/any other electronic device) in teaching Mathematics?

Yes ☐ No ☐

12. Do you take private tuitions in Mathematics?

Yes ☐ No ☐

13. If yes, do you understand Mathematics taught in private tuition classes?

Yes ☐ No ☐

14. Do you get the opportunity to attend free classes organized by local clubs or any other organization?

Yes ☐ No ☐

15. What is your performance in Mathematics?

Poor (less than 35%) ☐ Average (35 – 59%) ☐

Good (60 – 80%) ☐ Very good (above 80%) ☐

16. Are you able to complete the assignments given in the class within time?

Yes ☐ No ☐

17. Who helps you in doing Mathematics assignments at home? (You can put tick "✓" in more than one option)

Older siblings ☐ Father ☐ Mother ☐

Private Tutor ☐ Other family members ☐ No one ☐

18. How did you learn Mathematics when the school was closed during pandemic?

_____

_____

_____

…… …….…… ……..

(Name of FI) (Mobile No.) (Signature of FI with date)

GUARDIAN'S QUESTIONNAIRE

SURVEY TOOL

FOR

A STUDY ON "REASONS FOR LOW PERFORMANCE IN MATHEMATICS OF CLASS VIII STUDENTS IN PURULIA DISTRICT OF WEST BENGAL"

Government of West Bengal

DEPARTMENT OF SCHOOL EDUCATION

STATE COUNCIL OF EDUCATIONAL RESEARCH & TRAINING

25/3, Ballygunge Circular Road, Kolkata - 700019

GUARDIAN'S QUESTIONNAIRE (GQ)

STATE: WEST BENGAL

District: …….. Date of Survey…….

[Please put a tick "✓" in the appropriate box]

1. Your name : _____

2. Name of your child studying in class VIII :_____

3. Your educational qualification:

Below Madhyamik ☐ Madhyamik ☐ Higher Secondary ☐ Graduate ☐

Post-Graduate ☐

4. Your Occupation:

Agriculture ☐ Service ☐ Business ☐ Daily labourer ☐

Work in other people's homes ☐ No particular job as such ☐

Any other work (please specify) _____

5. Educational qualification of your spouse (Husband/Wife):

Below Madhyamik ☐ Madhyamik ☐ Higher Secondary ☐ Graduate ☐

Post-Graduate ☐

6. Occupation of your spouse:

Agriculture ☐ Service ☐ Business ☐ Daily labourer ☐

Works in other people's homes ☐ No particular job as such ☐

Any other work (please specify) _____

7. Total annual income of the family:

Below Rs. 1lakh ☐ Rs. 1lakh to Rs. 2lakh ☐ Rs. 2lakh to Rs. 5lakh ☐

Rs. 5lakh to Rs. 10lakh ☐ Above Rs. 10lakh ☐

8. Total number of family members ☐

9. Number of electronic devices (laptop, ordinary mobile, smart phone, tablets) in your family:

Laptop ☐ Tablet ☐ Smart Phone ☐ Ordinary mobile ☐

10. Do you have internet facility at your home?

Yes ☐ No ☐

11. Does your child have a device solely earmarked for him/her for studying?

Yes ☐ No ☐

12. Is your child able to complete all mathematics home and class assignments in time?

Yes ☐ No ☐

13. Who helps your child with mathematics at home? (You can put tick "✓" in more than one option)

You ☐ Your spouse ☐ Older siblings ☐ Other family members ☐

Private tutor ☐ No One ☐

14. Does your child like Mathematics as a subject?

Yes ☐ No ☐

15. Does your child practise Mathematics regularly?

Yes ☐ No ☐

16. If yes, for how my hours does the child practice daily?

Less than 1 hour ☐ 1-2 hours ☐ More than 2 hours ☐

17. If the answer to item no. 16 is ‘no’, then how many days in a week does your child practise sums?

Once in 2 days ☐

Once in 3 days ☐

Once in 4 days ☐

Once in a week ☐

…… ……..…… ……..

(Name of FI) (Mobile No.) (Signature of FI with date)