

**Quality of Mathematics Teaching and Learning  
in the Primary Schools of Bangladesh**

**M.Phil Thesis**

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Session no: 2011-2012

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January 2015

# **Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh**

A Thesis Submitted to the University of Dhaka in partial fulfillment for the  
Award of the Degree of Master of Philosophy in Education

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January 2015

## **DEDICATION**

For those children in Bangladesh who are still deprived of education.

## **DECLARATION**

I, Md. Billal Hossain, hereby declare that the thesis entitled “Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh” being submitted to the University of Dhaka by me for the award of the degree of Master of Philosophy in education is my own research work done under the supervision of Professor Dr. Md. Abul Ehsan, Former Director, Institute of Education and Research, University of Dhaka. I also declare that the thesis has not formed the basis for the award of M. Phil or Ph. D degree or other similar title of any candidate of any university or institutions.

Place: Dhaka

Date : 24.01.2015

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Research Scholar

## **CERTIFICATE**

I have the pleasure to certify that the thesis entitled “Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh” submitted by Md. Billal Hossain to the Institute of Education and Research at the university of Dhaka, Bangladesh for the degree of Master of Philosophy in Education is an original research work done by him under my supervision. To the best of my knowledge, this thesis has not been previously submitted for any diploma or degree to any other university or institute. Materials obtained from different sources have been duly acknowledged by the researcher in the relevant places of the thesis.

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Supervisor  
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## ACRONYMS

ADB	Asian Development Bank
ASPR	Annual Sector Performance Report
AUEO	Assistant Upazila Education Officer
B. Ed	Bachelor of Education
M ED	Master of Education
C in Ed	Certificate in Education
DPED	Diploma in Primary Education
DPE	Directorate of Primary Education
DPEO	District Primary Education Officer
GPS	Govt. Primary School
HT	Head Teacher
IER	Institute of Education and Research
MOPME	Ministry of Primary and Mass Education
MOE	Ministry of Education
MT	Math Teacher
NCTB	National Curriculum and Textbook Board
NAPE	National Academy of Primary Education
NSA	National Student Assessment
PECE	Primary Education Completion Examination
PTI	Primary Training Institute
PTA	Parents Teachers Association
SMC	School Managing Committee
UPE	Universal Primary Education
UEO	Upazila Education Officer
URC	Upazila Resource Center
WB	World Bank

## **ABSTRACT**

Although there has been a rapid growth in enrollments and overall growth in the primary education system of Bangladesh but the quality in primary education is not at in a satisfactory level. The quality teaching and learning alone play an important role in achieving overall quality education. According to the record most of the PEC examination, the percentage of the pass rate of mathematics was the lowest among other subjects. Even internal examination results also showed the same picture. It was also revealed that the lack of different components of quality teaching-learning e.g. use of proper teaching method, effective use of teaching aids, teachers' working load, student-teacher ratio, proper class size etc. have been prevailing in the primary schools. The purpose of this study was to investigate and describe the present situation of quality teaching learning in mathematics of primary schools in Bangladesh specially government primary schools in Bangladesh. The study collected data from a sample of 16 head teachers, 32 math teachers, 48 students from 16 different types of schools. Also 32 mathematics classes were observed for realizing actual teaching-learning situations. Data were collected using structured questionnaires, class observations and structured interview schedule. Both qualitative and quantitative methods were used for analysis of data. The findings of the study revealed that student-teacher ratio was high and also there were lack of subject based teaching and effective use of teaching aid. Most of the teachers never used teaching aids. Students always needed help from others. A large number of students did not interact with teacher in the classrooms. About fifty percent of math teachers did not have any subject based training. At the annual/PEC examinations of 2013 the students who failed in different subjects also failed in mathematics. The study recommended that student teacher ratio should be reduced by appointing new teacher, quality based supervision should be improved. Subject based teaching are very needed otherwise at least subject based training should be available for all teachers.



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# **CHAPTER 1**

# **INTRODUCTION**

**CHAPTER 1**  
**INTRODUCTION**

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## **1.1 Background**

Primary education is the basis of education at all levels which is why it bears the greatest significance in the total education system of any country. So if this foundation is weak, it produces an adverse effect not only on the life of an individual but also on socio-economic development of a nation.

Bangladesh is currently running one of the largest primary education sectors in the world with as many as 104017 primary institutions of different kinds (ASPR, 2013).

According to ASPR (2013) MoPME is the main primary education provider. MoPME oversees more than 66.2% of these schools and around 82% of total children enrolled in primary level educational institutions. Around 70.7% primary teachers are working in MoPME managed schools.

As a result of the multi-dimensional interventions implemented during the past two decades

Bangladesh has seen a remarkable progress with regard to the quantitative development particularly in enrolment and gender parity of primary education ( DPE, 2012 )

The enrolment rate has recently increased to about 100%. Overall dropout rate declined. Survival rate is significantly higher than before. The cycle completion rate has been gradually improving since 2005. The average student absenteeism has reduced gradually since 2005. It is estimated that 49% of the schools has met the student teacher ratio of 46:1 , 89% teachers of schools have the professionals

qualifications. The increase was equally shared between boys and girls (ASPR, 2013). Despite improvement in certain aspects of basic education in quantitative terms, quality of education remains to be a great cause of concern for the government, policy makers, donors and others concerned (Rahaman, n.d.). Improving the quality of primary education is one of Bangladesh's highest priorities (World Bank report 2011)

Chowdhury et al., (2002) mentioned that one-third of those who complete primary education have been found to be functionally illiterate. ADB (2003) also mentioned that although there has been a rapid growth in enrollments and strong overall growth in the primary education system, the quality of primary education in Bangladesh is not at a satisfactory level. However, in enhancing quality teaching and learning, a lot of factors play an important role such as, curriculum, teaching-learning methods, assessment, teaching materials, school environment, learners' socio-economic background etc. Classroom teachers also play an important role in enhancing quality teaching and learning.

With a view to improving the quality of education a competency-based curriculum developed by NCTB in 1988 has been implemented in the primary schools. Afterwards the curriculum was further renewed and modified several times. Recently in 2012 the national curriculum of primary schools has been thoroughly revised and renewed by NCTB. This curriculum consists of the following components.

1. Aim( there is one broad aim)
2. Objectives(13)

3. Terminal competencies(29)
4. Class wise competencies
5. Subject wise competencies
6. Learning outcomes
7. Contents(subjects)
8. Teaching-learning activities
9. Evaluation process

It was expected in the curriculum that after completing 5-year cycle a student will achieve all the competencies. The curriculum was identified the following six core subjects through which these competencies would be achieved:

1. Bangla
2. English
3. Mathematics
4. Science
5. Social science
6. Religious studies

Mathematics is one of the subjects through which these competencies will be achieved. In case of mathematics different diagram and information have been newly added in mathematical terms. For the huge development of information technology the world has been a global village or a universe village. Mathematics has contributed a lot under this progress and has been expressed logical thinking and creativity. From own environment in order to solve creating mathematical problems

in daily life, subject matters have to present to achieve competency in making eager and assist in logical thinking expression of which method is easy to difficult and known to unknown. Mathematics learning will be very interesting for the children and mathematics mentality will be grown up among them so that they would be interested in learning mathematics and they would be able to keep important role in the activities of building the nation which will be the best policy of loving the country (Curriculum 2012, NCTB). On the contrary it is thought that the ability of solving the problems, finding logical causes and the ability of absolute thinking are achieved through mathematics (Lutfuzzaman *et al.* 2006). So we should improve the standard of mathematics teaching-learning and make it suitable according to the demand of generation.

With a view to providing critical evidence of the efficacy of PEDP II interventions to improve the quality of education and pupil learning outcomes in cognitive and other skills, the DPE decided to conduct a series of National Assessments of Learning Achievement of primary pupils. The first in this series was conducted in 2006, and the study conducted in 2008 is the second one and NSA 2011 was the 3rd in the series. NSA 2011 clearly indicates the performance of children of grade 3 and 5 which gives us a picture of the quality of primary education in Bangladesh especially in mathematics where 50 % students achieved relevant competencies in class 3 and 33 % students achieved relevant competencies in class 5 (NSA report 2011).

Learning mathematics helps a learner's growth of humanity. It helps logical thinking,

simplicity, honesty, self-appreciation and concentration of mind. It also helps in solving real problems of life. The lack of quality teaching and learning of primary mathematics creates low achievers which can increase drop out percentage and makes a learner disinterested in learning science. And consequently this acts as a bar to achieving science-based objectives and aims of primary education. So the researcher was interested to conduct a study on Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh.

### **1.2 Statement of the Problem:**

The title of the study is “Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh”. The intent of the study is to explore the causes why student cannot achieve the relevant competency of mathematics. This will be done by analyzing the present situation of mathematics teaching and learning in the primary schools of Bangladesh. Researcher was concerned that the lack of quality teaching-learning exists in mathematics in primary schools in our country because the percentage of pass rate of mathematics is always the lowest among the subjects of primary education completion examination (PECE) from 2009 to 2012. Besides, as a teacher of mathematics researcher always faced students’ beliefs that mathematics is more difficult than other subjects. On the other hand only 33 % students achieved relevant competencies in class 5 by the end of the year (NSA report 2011). This needs to be analyzed by an academic research and found out the actual situation of mathematics teaching-learning in our country.

### **1.3 Rationale for the Study:**

Secondary School teachers are frequently complaining that the base of mathematical knowledge built from primary is very weak which causes continuous weakness and fear in students for learning Mathematics (Report on listening Workshop for Quality Science and Mathematics Education in Primary Schools, held on 12th June, 2009, organized by IED, Brac University). On the other hand only 33 % students achieved relevant competencies in mathematics in class 5 (NSA report 2011). In order to find out a real solution to any problem it is very important to identify and anatomize the reasons behind it. The report of the committee formed for the development of mathematics in the secondary level ( June , 2010) focused that it has been proved that through exchange of thoughts with the experts, group discussion, workshop and different statistics, that the average knowledge of students at mathematics is weak after completion of the primary stage.

The achievement of the students at mathematics which is found from the above research, each and every , math teachers, trainers, researchers, guardians, SMC and the supervising authority can be rethink about their duties newly. Math teachers will be aware of their lacking then they will be able to overcome it. The trainers will be able to persuade the math teachers to rectify their lacking and mistakes where they tend to do. Head teachers and supervising authorities will more active to take prompt actions regarding the teachers lacking and drawbacks. To ensure quality teaching-learning the authority can be take necessary measures on infrastructure development, allotment of finance and quality training by assessing the opinions of teachers about

different problems. The quality of mathematics at primary school can be compared to that of other countries of the world. Other researchers will apply the result of above research to improve the quality in mathematics teaching.

Researcher believes whole heartedly, this research will play a great role in reaching the goal of quality teaching-learning in mathematics at primary level of Bangladesh.

#### **1.4 Purpose of the study:**

This study intends to explore the present situation of mathematics teaching and learning in the primary schools of Bangladesh. The perceptions of teachers and students about mathematics teaching-learning are also a major focus of the study.

#### **1.5 Research Questions:**

1. What are the mathematics teacher's opinions about mathematics teaching at primary level?
2. What are the student's perceptions about their mathematics learning?
3. What are the actual pictures of classroom practice of mathematics teaching learning at primary level?
4. What are the students' (class three, four and five) learning achievements in mathematics according to their annual or PEC examination?
5. What are the head teachers' perception and suggestions to ensure the quality of mathematics teaching learning at primary level?

### **1.6 Limitations of the study:**

- ❖ A major limitation of this study was selection of respondents for the study such as Head teachers, Math teachers, Students. These samples were selected conveniently due to financial and time constraints.
- ❖ The scope of the study was limited to only 4 administrative divisions in Bangladesh.
- ❖ The convenient samples have created limits to the generalizability of the findings. So these should be used cautiously because it does not properly reflect the target population.
- ❖ Another limitation of this study was, the researcher could not consider the opinion of other stakeholders such as guardians' perception, SMC members' perceptions about the quality of mathematics teaching learning in the primary schools of Bangladesh.
- ❖ The study was also limited to GPS whereas in Bangladesh there exists 13 types of primary schools.

### **1.7 Organization of the study:**

The study has been organized into five chapters. Chapter one describes introduction where included background, statement of the problem, rationale for the study, purpose of the study, research questions, limitations of the study and organization of the study. Chapter two deals introduction, concept of quality in education, quality teaching learning specially mathematics, Mathematics curriculum in Primary grades , Students achievement in mathematics, Study on students and teachers' Perception



on mathematics, Teacher training in mathematics, researcher remark, theoretical framework of the study. Chapter three focuses methodology where introduction, research design, population, the Sample, tools for data collection, tri-angulation, piloting, procedure of data collection, ethical issues, analysis and interpretation of data. Chapter four presents analysis and interpretation of data where included introduction, math teacher's qualifications and experiences, teacher's beliefs about quality teaching-learning, teaching-learning activities in the classroom, student's learning achievement, challenges to ensure quality teaching-learning, suggestions to improve quality teaching-learning . Chapter five describes findings and recommendations where included introduction, major findings, conclusions, recommendations and suggestions for further research.

# **CHAPTER 2**

## **LITERATURE REVIEW**

## **CHAPTER 2**

### **LITERATURE REVIEW**

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## 2.1 Introduction:

Review of literature is an important part of research. It shows established findings, conflicting evidence and gaps that means literature review can identify previous approaches to the topic, identify central issues in the field, integrate what previous researchers have found and identify important issues still unresolved. In this study literature review helped to decide the sample, sampling technique, developing questionnaires, collecting data and finally processing and analyzing the data. The literature review was undertaken on the following themes.

- Concept of Quality in education
- Quality teaching-learning specially mathematics
- Mathematics curriculum in Primary grades
- Students achievement in mathematics
- Study on students and teachers' Perception on mathematics
- Teacher training in mathematics

## 2.2: Concept of Quality in education:

**The World Bank (1995)** has tried to define quality in education in such way

*“Quality in education is difficult to define and measure. An adequate definition must include student outcomes. Most educators would also include in the definition the nature of the educational experience that help to produce thus outcomes - the learning environment.”*

**UNESCO's (1996)** highly focused about quality in education, they concluded that it is desirable everywhere and all children should be enrolled in basic education in all countries.

**Ulf Fredriksson (2002)** focused that education is always preparing persons for the future. Quality education is the education that best fits the present and future needs of the learners. Quality cannot be seen as a static concept. In a changing world this means that what was considered quality education yesterday might not meet the standard of what will be understood as quality tomorrow. Quality is not always only a matter of learning things well. Quality is to learn the right things and to learn them well. It is not good enough to learn the right things only half well, and it may be even worse to learn the wrong things well. It can be noted that education in many parts of the world do not deal with what is sometimes referred to as life skills. For many children, in for example Africa, a quality education would be an education which included knowledge about HIV/AIDS and how protect yourself. He also stated that teachers have a key position in all kinds of education. No measures are possible to improve education if the teachers are not thought of. Most reforms and improvement strategies have to deal with what is going on in the classroom, which means the everyday work of the teachers.

**World Education Forum (2000)** emphasized that not only the need to achieve education for all, but did also notice the need to improve the quality of education. Based on the recommendations in the Dakar Framework for Action other international conventions concluded that everyone has the right not only to receive education, but

also to receive education of a high quality. A quality education is the preparation for working life, life in society and private life. This should be achieved without distinctions of any kind, such as those based on parents' income, color, gender, language, religion, political or other opinion, national or social origin. But providing this quality education teachers have to play key role.

**ILO, UNESCO, EI and WCT (2001)** revealed that the improvement of the quality of education depends on the quality teaching and learning environments, including adequate infrastructure, appropriate class sizes (teacher/pupil ratios) which strengthen professional teaching standards and child centered learning, and sufficient teaching materials, initial teacher education , teachers professional development (teachers training) with many other activities.

**The World Bank Report (2008)** Over the past two decades though Bangladesh's success in achieving gender parity and considerable progress was made in increasing primary enrollment but Bangladesh have to proceed more, the quality in primary education to attain the goal of EFA . The objectives of this study were where Bangladesh stands in terms of achieving the Education for All (EFA) goals; and what could help Bangladesh to meet the EFA goals by 2015. Improving the overall quality of primary education they have focused to improve teacher quality. From a detailed school survey and national achievement test they have found possible reasons for low levels of student achievement such as the student-teacher ratio, their teaching load, textbooks and other instructional materials among all other reasons. All these factors

are highly correlated with achievement test scores of the primary schools students.

**The Education Watch report (2002)** claimed that cause of the low performance of primary school students are memory-base teaching style and the inadequate teaching materials among all other causes.

**UNICEF (2000)** claimed that during the past decade much has been done globally to provide quality basic education for children. Quality education depends on learners who are healthy, environments that are healthy, contents that are relevant, appropriate process and quality outcomes. Class size, teacher students ratio are the component of healthy environments. Quality teaching and quality learning are the components of appropriate process and quality outcomes respectively.

**The OECD report (1994)** defines teacher quality in five dimensions such as (i) knowledge of substantive areas and content (ii) pedagogic skill, including the acquisition and ability to use a repertoire of teaching strategies (iii) reflection and ability to be self-critical, the hallmark of teacher professionalism (iv) empathy, and commitment to the acknowledgement of the dignity of other (v) managerial competence, as teachers assume a range of managerial responsibilities within and outside the classroom.

For example did a Scottish student in grade 2/3 think that a good teacher; *“is very clever, doesn’t shout ,helps you every day, is not bossy, has faith in you, is funny, is patient, is good at work, tells you clearly what to do, helps you with mistakes, marks your work, helps you to read, helps you with spelling and has got courage.”* (**Ulf Fredriksson as cited in MacBeath et al., 1996, p. 55).**

**Unicef Bangladesh (2009)** stated that Bangladesh has one of the largest primary education systems in the world with an estimated 16.4 million primary school aged children (6 to 10 years). Despite many achievements during the past decade one of the major challenges of Bangladesh is poor quality of primary education. The quality of the teaching-learning process, children's learning achievements are major challenges. Poor qualifications and lack of teacher motivation are also challenges. Approximately 24% of Government Primary Schools and Registered Non-Government Primary Schools teachers are untrained. Traditional and dominant way of teaching in most schools tends to focus on memorizing facts.

The aims of PEDP II was to ensure the quality of primary education for all eligible children in the country through (a) improving the quality of teaching and learning and raising student achievement.

To improve the quality of education, PEDPII focuses on in-service teacher training. Teachers are trained in interactive teaching approaches and also receive subject-based training, focusing on new child-friendly teaching techniques.

In 2008 it was estimated that 88% of school were meeting the minimum requirement of 46 students per teacher. However, it is important to note that the number of students per grade can vary significantly. For example, in 2007, the teacher-pupil ratio was 1:80 to 1:100 in 69 upazilas and more than 1:100 in 23 upazilas. This is an improvement from 2005 when 124 upazilas reported classrooms with more than 100 students.



**Haq, Ehsan and Jabbar (2004)** have found that the quality of education is related to the teachers' qualification, with physical environment of school, students' achievement, their continuation in school and daily attendance. The effective teaching learning was associated with higher student's achievement with other curricular factors like the availability of text books and its completion, total contact hours. Teachers' quality in terms of educational background, experience and other non-academic matters varied to a great extent by the level of school performance. The objective of their study was to determine the factors that are relevant to qualitative improvement of primary education in Bangladesh. 95 primary schools were randomly selected from three Divisions of Bangladesh. The sampled schools were evaluated in terms of five plausible quality indicators. The descending order of schools according to their performance the highest 10% and lowest 10% of schools were taken for comparative analysis of quality issues.

According to **Adams (1993)** opinion the terms efficiency, effectiveness, equity and quality have often been used synonymously.

### **2.3 Quality teaching-learning specially mathematics:**

**B. O. Smith's (1969)** focused that teaching is the action of a person who teaches that is the profession of a teacher which is imparting knowledge or skill. Teaching is that which results in learning, it is the process - product approach. There are drawbacks with this form of definition where learning is the responsibility of the teacher. If students do not learn, it is the fault of the teacher. Because an external observer cannot

tell whether or not a teacher is actually teaching, so student achievement is the measurement. Certain activities create result in learning, whereas successful teaching cannot be reduced to a set of general rules, or a prescribed pattern of behavior

According to scientific definition, "Teaching is the process of carrying out those activities that experience has shown to be effective in getting students to learn".

According to working definition, "Teaching is undertaking certain ethical tasks or activities the intention of which is to induce learning"

Teaching is what teachers do and Learning is what students do. If this relationship is truly exists then (1) Teacher's ability to teach should be judged on the basis of student learning. (2) Teacher's should be held accountable for student learning despite poor parenting, negative attitudes, and other social ills. (3) Teacher's pay should be based at least in part on student outcomes. But there is not necessarily a connection between teaching and learning because some students can and will learn in spite of bad teaching and also some students will not learn even with the best teaching.

**Haq ( n.d )** told that teaching is the arrangement of information and environment to facilitate learning and learning is the development of new knowledge, skills, or attitudes when the individual interacts with information and environment and bring changes in the neurons of brain. Teacher will give attention to everyone, use stimulating approach, use all memory lanes, ask question through eye contact, do not discriminate the students, show respect to everyone, avoid humiliating words and tone, highlight the strengths not the weakness.

**McKinney, Kathleen (1988)** thought that how can maximize our students thinking, learning, motivation, and curiosity. It was decided and described the five components of quality teaching by the acronym “FACES” as fairness, application, challenge, entertainment and service.

**Fairness :** Any teaching style can work if the teacher is truly involved and sincerely interested in his or her students.

**Application:** Strategies for incorporating application include the use of group projects, discussion, exam questions, which emphasize application, projects, problem solving exercises, field placements, internships, original examples, and thought-problems.

**Challenge:** Strategies for challenging students include teaching controversially, playing the devil’s advocate to encourage thinking, critiquing drafts of assignments before they are turned in for grading, providing detailed written and verbal feedback on exams and assignments, giving detailed examples of what is expected and wanted from students, and even grading on a curve if the aim has been set too high for most students who have put forth real effort. Be aware, however, that challenging students takes extra time and effort and also may invite frustration.

**Entertainment:** Entertainment can be enhanced through numerous mechanisms: film, video, guest speakers, debates, simulation games, phone interviews, and field trips. Even our own style can be of some help: use of gestures, eye contact, facial expressions, vocabulary, and sense of humor.

**Service:** Service means representing the discipline by giving guest lectures to wider

audiences, conducting and participating in workshops for interested groups, writing and doing research, especially on teaching, and sitting on committees concerned with teaching and curricula.

**Nunes, & Bryant (1996)** found that some beliefs of math teacher or students can increase the difficulty level of mathematics. It is also a bar for quality teaching learning in mathematics. ‘There are only few people who can learn mathematics. “That is why only few people can do mathematics. Mathematics is abstract and it has no connection with everyday life and that is why somebody cannot learn it in everyday life’.

**Lawrence et. al (2004)** told that teaching practice reported by students has a consistently important effect on affective outcomes of mathematics teaching. Teacher knowledge and educational background is positively, but weakly related to teacher effectiveness. The more this education has to do with mathematical content and pedagogy. The effectiveness of mathematics teaching in a school is related to the strength of professional community in the school's mathematics departments. The quality of the teachers in terms of background training, experience, subject matter qualifications and teacher education. The quality and amount of professional development in which teachers have engaged over recent years. The quality of the professional community in which teachers work, for example, the ethos of the work group, opportunities for collegial work within the school. Teachers who had received training in the teaching of mathematics in their initial teacher education program had higher levels of pedagogical knowledge and total knowledge. Teachers who had

majored in mathematics in their undergraduate degree had higher levels of knowledge of pedagogy and total knowledge. Teachers who said their main teaching subject was mathematics had higher levels of pedagogical and content knowledge. Teachers who scored higher on pedagogical and content knowledge in mathematics tended produce higher levels of student achievement, and have students who tended to report higher levels of enjoyment of mathematics, gave higher ratings of their teachers' pedagogical skills, and of the quality of the learning environment in their mathematics classes.

Data were collected from Principals, teachers and students. Teachers completed a questionnaire which provided information about their gender, educational background, their experiences of professional development and of teaching. Interviews were also conducted at a small number of schools. Principals, Heads of Departments and teachers were interviewed. A total of 50 schools agreed to participate in the study. Data from this study were used to identify those schools with a high average score in mathematical literacy, and those schools with a low average score. A total of 206 teachers provided data for the study and 30393 students surveyed and tested.

The investigation of effective mathematics teaching was undertaken using a variety of instruments and techniques to try to capture both the context in which teaching was taking place as well as to provide reliable estimates of measurable processes and outcomes. To achieve this mix of data, a variety of data sources was used.

They described the factors associated with effective mathematics teaching such as the knowledge, beliefs, understandings and practices of teachers; teachers educational qualifications, training, quality of professional development, student outcomes,

teaching practices in the classroom. Since the research was concerned to identify the characteristics of effective mathematics teachers, it focuses upon teacher attributes and qualities.

**Jennifer et.al. (2008)** found that if math teachers include group work, intervention groups, parental involvement, entertainment elements, and explicit instruction in their teaching carefully and plan wise, its increase students' curiosity, enjoyment, and success in learning mathematics. It is reported that the concentrated use of the varied instructional strategies affected the atmosphere of the classroom during math period. The students were more involved in math activities, especially during partner learning and peer tutoring. The audio, visual, and kinesthetic modes of instruction, students actually appeared more attentive during direct instruction. Students whose parents supervised their homework assignments performed better on daily quizzes. At the end of the three-week study a 27-point increase was achieved between the pre-and posttest.

Objectives of their study was how to improve instructional strategies for teaching elementary mathematics and “What are the most effective ways to teach mathematics to elementary school children?” The methodology of the study was involved in three steps. Firstly ten teachers in the school were asked to respond to a questionnaire where teachers were asked about instructional methods they employ for teaching math, and they were asked about the difficulties in teaching mathematics. Then the parents were asked to sign a permission slip allowing their children to be part of the study where math teachers experimented with instructional strategies and finally the

implementation of a variety of instructional strategies during the daily math period.

**Allen, Barbara (2010)** told that mathematics teacher would be a more effective teacher if only he had more preparation time. A math teacher can accelerate learning by stimulating and challenging pupils and a math teacher would be successful if he or she follows examples. Data were collected near the start of the course in a written questionnaire from 100 primary math teachers. There were two forms of items on the questionnaire: quantitative and qualitative. The analysis of the quantitative items was a simple tally and percentage of the total responses. The qualitative items were sorted into general categories in line with grounded theory approaches.

**Sir Peter Williams Review (2008)**, were underpinned by a philosophy that professional development for teachers needs three interlinking strands (1)subject knowledge (2) subject related pedagogy and (3) embedding in practice.

**MARTUA MANULLANG (2005 )** found that there is a significant correlation of the variables of teachers' educational level, teaching experience, and professional attitude with the quality of the teaching and learning interaction.

**Uddin MD. Mohsin and Takuya BABA (2007)** investigated on the quality of education specially mathematics education from angles of both pupils and teachers by focusing on conceptual understanding of the fraction as teaching material .In conclusion they have found Three points as (1) Uneven distribution of weak areas for pupils and this tendency is not uniform between urban and rural school. (2) very few pupils were able to explain the sentence of problem. ( 3) Teachers less attention to pupils difficulty and understanding level. They have found there is no subject - based

teaching at the primary level of Bangladesh. Teachers have to teach all subjects. In this study they developed three research tools to collect data from teachers and pupils named (1) achievement test for students to identify the understanding concept of fractions using sentence problems (2) Interviews item for pupils to identify the linguistic weakness of pupils in the sentence problems and (3) Questionnaires for teachers to identify teachers perception about pupils , teaching and text book . They have selected 47 pupils where boys 19 and girls 28 on the other hand from urban school 24 and from rural school 23 .About half of the Govt. primary schools belong to B category out of four categories A,B,C,D which is done by management based on different criteria in Bangladesh . so B category can be showed as an average performance .Two sample schools were chosen from this category with consultation of local authority , one from urban area and other from rural area . They have selected four teachers as a sample where two teachers teach the current year and the other two teachers have taught previous year. Since the sample size was small they didn't conduct statistical test but did descriptive statistics. From achievement test they have found that urban school performance is comparatively better than rural school. They have selected 10 pupils for interview on the basis of their exam result about mathematics in the previous term. Five of them acquired good grade and the other five acquired bad grade. The study recommended that in future, teaching method should be tailored according to student needs.

**Yeigh, Tony (2008)** found that the acquisition, development and exercise of knowledge and skills are related to quality teaching practices. The relationship



between quality teaching and professional learning is strongly influenced by the collaborative and reflective cycles associated with action learning. Here a framework were developed that what makes a good teacher.

**David Chapman and Don Adams** ( as cited in Comber and Keeves 1973, Heyneman and Loxley 1983) focused that teachers' years of schooling raise student achievement.

**Sembing and Livingstone (1981)**, ( as cited in Chapman and Adams, 2002) told that upgrading the skills of teachers leads to higher student achievement. **Lockheed and Longford (1991)**, ( as cited in Chapman and Adams,2002) found that some teacher and school characteristics are positively associated with student learning in Thailand and at the same time, some teaching practices are negatively related to learning:

**Warwick and Reimers (1995)** emphasized that preparation of teacher is essential for quality teaching. Pakistan prepares its candidates for teaching mainly through two types of training: formal education and teacher certification and also they told that Primary-school teaching has the lowest status of any profession and offers few chances for promotion.

**Alam and Jahan (2007)** found that teachers' understanding about quality of education at primary level were to prepare children as good citizens, to pass the examinations, to be able to get rid of poverty, achieving maximum competencies set by the NCTB, to prepare children to get a job, to enable the children to cope with real life situations teachers' understanding about quality of education at primary level. Learners did not keep in their everyday real-life situations which they learned at

primary schools. Most of the teachers were not satisfied with the existing quality in primary education. Teachers were not satisfied with opportunities provided for their professional development. Too much load was given to teachers other than teaching activities, such as national survey, tree plantation, voter registration etc. Most of the teachers did not choose teaching profession as a first choice. As obstacles faced by teachers for improving quality primary education subject-based training as the highest priority, then training in classroom management and the proper use of teaching aids was identified.

This study was a small-scale survey with purposive sampling technique. Questionnaire used as a data collection tool consists of 48 statements under 8 major sub-headings where 4 points 'The Likert Scale' had been used. The survey was carried out sadar Upzilla in Gaibandha, a district of northern part of Bangladesh. There were three open-ended questions to provide an opportunity for respondents to present their in-depth understandings. The study was undertaken to ascertain views and opinions of classroom teachers of selected primary schools regarding certain issues and obtain their suggestions. Teachers provided their opinions regarding what constitutes quality of education at primary level. Useful information was obtained regarding infrastructure of schools, environment, curriculum, teaching learning materials, relationship between head teacher and other teachers, among teachers, teachers and the community and SMC and PTAs' involvement in school matters. Here respondent teachers were 106 out of total 120 from 20 selected government primary schools where 76% was female and 24% was male.

**ABSIYE, HASSAN AHMED (2013)** revealed that teaching-learning resources affected the implementation of quality FPE. Findings further revealed that influence of teacher motivation and teacher quality affected the implementation of quality Free Primary Education. Researcher also found that pupil-teacher ratio had an influence of quality education as learning cannot take place effectively where class ratios are above the recommended 50:1. Teachers work load affected teaching and implementation of quality FPE. teaching and learning materials such as text books, teaching aids, stationeries and laboratories, classroom, textbooks, exercise books, library, toilets, desks, chairs, store, playing field, games equipment and water point, teachers' reference book, atlases, revision books, dictionaries, exercise books, affect academic learning. Lack of preparation of teachers affects teaching and learning and hence quality education. lack of teaching and learning materials , inadequate teachers , over enrollment , parents ignorance , teachers work overload affect the quality in FPE education . Recommendation of the study were more qualified teachers, reduce the high pupil-teachers ratio upwards the salaries and increase the hardship allowances of teachers. The provision of teaching -learning resources should increase in order to enhance effective learning.

The purpose of this study was to analyze the quality of Free Primary Education. The study objectives were to establish the influence of pupil-teacher ratio, the teaching and learning resources, the supervision, teacher motivation, the impact of management styles and finally the challenges faced in the implementation of quality FPE. The population for the study was 11,131. The sample comprised of 13 head teachers, 65

teachers, 130 pupils, 1 education officer, 1 Quality Assurance and Standards Officer totaling to 210 respondents. Data was collected by use of questionnaires and data was analyzed by use of qualitative and quantitative methods.

**Ramamoorthy, Balakumara and Karthikeyani (2013)** told that multimedia applications can use to develop an interactive teaching-learning as tool for underprivileged children in rural schools . Drop out, Child labor, lack of different facilities , inadequate teachers , lack of teaching aids, poor economic status are the problems of rural schools .

**Sabeerah and Margaret (2013)** indicated that the quality of teaching and learning provided in the infant level classrooms was influenced by a number of factors related to the home/school connection, critical school support, teacher attributes, and student attributes. The teacher needed knowledge and experiences that impact on learning in special situations. All four teachers expressed the view that the availability of resources was a critical school support needed for teaching at the infant level. Parental supports for learning, Parents' expectation for children, Parent/teacher communication are needed for quality teaching- learning.

A qualitative approach was used to gain an understanding of the factors that might be impacting the quality of teaching and learning provided at the infant level of an urban primary school in Trinidad. In order to obtain an in-depth understanding of the phenomenon, four teachers were chosen for the study using a purposive sampling strategy. Data were collected through semi-structured interviews through audio-taped interviews. The research questions of the study were (1) What are teachers' views

about factors that support quality teaching and learning in the Infant Department of a primary school? (2) What are teachers' views about factors that inhibit quality teaching and learning in the Infant Department of a primary school?

[Banu, Mahmuda Shaila \(2012\)](#) focused on the quality of preschool classroom practices in Bangladesh because here researcher has tried to explore the quality of classroom teaching practices. Finally she emphasized that quality of classroom teaching practices is important for quality preschools education in Bangladesh. The study, which involved a government, a private and a NGO preschool, adopted qualitative data collection approaches of document analysis, classroom observation and semi-structured interviews with two head teachers, a Program Organizer and six teachers who were purposefully selected from these schools. Based on these findings the study proposed a transformative postcolonial model for developing quality preschool systems in Bangladesh.

**Kalene et. al (2005)** reported that they have found the biggest problem Bangladesh seems to face in the pursuit of its educational goals is the lingering poor quality of primary education. Achievement and competency levels of most children are very low.

**Medinat (2009)** found from the assessment of Active Learning Technique (ALT) of Nigerian Primary School teachers, Active Learning Technique (ALT) was interactive, interesting, motivating, participatory and highly innovative. Based on the findings, it was recommended that the teaching methodology of Nigerian Primary School teachers should be regularly updated through workshops on ALT and that teaching of

Mathematics at primary level should be handled by trained Mathematics teachers. A total of 120 male and female primary school teachers were purposively sampled from the North central geo-political zone of Nigeria. The sampled primary school teachers were participants at a Mathematics workshop organized by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Out of the 120 participants expected at the workshop, only 85 participated in all the interactive activities on the ALT. The data were collected by using questionnaire and analyzed using frequency counts and percentages.

**Julie and Douglas (2009)** concluded about teaching mathematics in the early grades. Findings provide some guidance in mathematics instruction. Math learning trajectories have three parts: a mathematical goal, a developmental path along which children's math knowledge grows to reach that goal, and a set of instructional tasks, or activities. Learning mathematics in primary grades is important, all children's potential to learn math, and teachers' need to understand children's learning development—have implications for teaching primary grade math well.

**Penny Latham (2002)** presented the findings based on interviews and observations of lessons in four primary schools and two secondary schools. This report was based on five lesson observations and two training session observations; interviews with six teachers; and questionnaire responses from seven teachers. Overall, teachers felt that the use of interactive whiteboard had a very positive impact on many aspects of their practice, including their planning, preparation and teaching, their expectations of their pupils and the quality of the lessons they produced. In their responses, 77 per cent of

teachers claimed to use whiteboards for all of their mathematics lessons, and 23 per cent described using the resource selectively, considering 'a few' lessons to be inappropriate for whiteboard use. The impact of the white board as a teaching resource was clearly articulated by one teacher as teaching with the new whiteboard is a different style of teaching that depends on swift manipulation of images which was harder than traditional equipment.

**Doreen and Alice (2007)** told about the use of resources as an essential part of teaching and learning in mathematics. Teaching - learning of mathematics does benefit from the effective use of visual and practical aids, recent research has questioned whether such use is always needed, or helpful, to children's mathematical understanding. He has explored the role that a wide range of resources could play in effective mathematics teaching and learning in the primary years. He has focused on -

- the value of resources to the teaching and learning of primary mathematics;
- the issues involved in the use of resources to support mathematics teaching and learning;
- the critical aspects involved in the choice and use of resources to support effective mathematics teaching and learning.

The selection and effective use of appropriate mathematical resources requires careful consideration and planning on the part of the teacher, it was also discussed.

He described the types of mathematical resources and how they may be used effectively. The term 'mathematical resource' were defined here as any form of

specific mathematical apparatus (structured or unstructured), image, ICT, game, tool, paper, or everyday material, Worksheets and textbooks which could be utilized to provide a mathematical teaching-learning aids.

**Päivi Perkkilä** (2001 ) stated that the role of teachers' beliefs during the mathematics lessons on the quality of classroom teaching and learning. Data were collected using questionnaire with likert – scale from primary school teachers included 70 statements concerning teachers' beliefs and conceptions about mathematics, learning mathematics, teaching mathematics, and mathematics teaching practices, especially use of mathematics textbooks. Here 6 teachers were selected from different primary schools. Teaching experience of these 6 teachers varied from 2 to 30 years. To make comparisons, the teachers' answers (beliefs) were classified in each level on the following scale: traditional, primarily traditional, mixed, primarily nontraditional, and nontraditional. Data collection for each teacher included from two weeks' classroom observations, teachers' written lesson plans, and interview of the teachers after the classroom observation period (the questions during the interview focused on the nature of mathematics, mathematics teaching and learning practices and mathematics textbooks, assessment, school recollections about mathematics and teachers' mathematics studies) . It has found that the teacher's beliefs about the content of mathematics were more strongly linked to teaching practice. Notes from classroom observations and interviews of those 6 teachers were used to describe consistencies and inconsistencies between the teachers' beliefs and teaching practices.

He focuses on primary school teachers' mathematics-related beliefs, which pertain to



their subjective knowledge. These beliefs act in mathematics classrooms as a hidden factor regulating the quality of mathematics teaching and learning. Some examples of teachers' beliefs and their teaching practices are exposed and discussed from the perspective of Finnish primary school teachers.

#### **2.4 Mathematics curriculum in Primary grades:**

The revision and renewal of curriculum is a continuous process. According to education policy 2010, 13 objectives have reduced and set from 22 as revised curriculum 2012 of primary education. To assist for achieving the problem solving quality, mathematical concept and logical thinking is one of them. 50 terminal competencies have reduced as the number of 29. In mathematics different picture and information have expressed as mathematical expression which is introduced newly. About new curriculum 2012 NCTB stated that learning mathematics helps a learner's growth of humanity. It helps logical thinking, simplicity, honesty, self-appreciation and concentration of mind. It also helps in solving real problems of life. Some of the terminal competency has reduced in new mathematics curriculum. As an example simplification and unitary method related terminal competency have discarded. Planned activities have newly added for class one and two. Planned activities have set about all learning outcomes for learners. For the huge development of information technology the world has been a global village or a universe village. Mathematics has contributed a lot under this progress and has been expressed logical thinking and creativity. From own environment in order to solve creating mathematical problems in daily life, subject matters have to present to achieve competency in making eager and

assist in logical thinking expression of which method is easy to difficult and known to unknown. Mathematics learning will be very interesting for the children and mathematics mentality will be grown up among them so that they would be interested in learning mathematics and they would be able to keep important role in the activities of building the nation which will be the best policy of loving the country. The terminal competencies of primary mathematics have introduced according to the demand of mathematics and its universal use and application.

**Haq M. Nazmu (n.d.)** curriculum is a plan for teaching, learning and developing the individuals, it covers the multidimensional aspects of knowledge, attitude and skills, it requires knowledge and skills about teaching, taught and techniques, it is interlinked with quality of education.

**Halim, Md. Abdul (2006 )** compared primary mathematics curriculum of Bangladesh with that of West Bengal of India in respect of Set of objectives, Content, Competencies of teachers, Classroom environment and facilities, Teaching-learning process etc. The writer described that in respect of in-service training programs, use of latest teaching techniques for teaching mathematics , use of lesson plan, use of teaching aids for helping learners for quicker and better comprehension of mathematical concepts, West Bengal are far better, scientific, systematic and effective than Bangladesh but teachers of both the countries use different methods such as question-answer method, problem-solving method, discussion method, etc. except discovery method. Teacher-pupil ratio and contact hours are not ideal for effective transaction of the curriculum in both the countries. The frequency of 'irregular

attendance' of pupils in classroom is higher in Bangladesh than in West Bengal of India which also creates problem for effective transaction of mathematics curriculum at primary level. The scholastic ability of mathematics teachers in West Bengal is much higher compared to the teachers in Bangladesh. Content areas included in mathematics textbooks of both the countries are almost similar. Sufficient information is provided in Teachers' Manual of Bangladesh and teachers are encouraged to make use of it for effective teaching while the Manual in West Bengal is not good enough for effective teaching. Both closed-ended type and open-ended type instruments were used in this study. Data were collected from documents, observations in real classroom situations, and experts (curriculum and subject specialists).

**Alsaadi. Aziza** (2001 ) compared primary mathematics curriculum of England and Qatar in respect of organization of the curriculum, expected standards , levels of objectives. The writer stated that the mathematics curriculum in Qatar was organized on the basis of year groups rather than levels where English situation were in terms of pupils' attainment and each individual school in England was responsible for planning the organization of the curriculum and pedagogy despite the fact that the content was prescribed nationally. The most important tools of primary math teachers in Qatar were the textbooks published by the Ministry of Education. Pupils in Qatar start primary education at age 6 and finished at 12 where in England it covers at aged 5 to 11. The main difference between the two curricula was in the relational level of understanding and it was stressed more in the English curriculum than in the Qatari curriculum. The writer explained the difference between the expectations for English

pupils and their Qatari counterparts on curriculum at different area of primary mathematics such as number and algebra, shape, space and measures, handling data, communicating, problem solving and reasoning etc.

**UDDIN. MD. MOHSIN** ( n.d. ) described that the idea of competency based curriculum was first introduced in America in the late 1960's in teacher education programs, and was later adapted for other professional educational, and vocational training programs in UK and Germany. In Bangladesh, since 1992 a curriculum with 53 competencies has been introduced at the primary education level and identified as the Essential Learning Continuum. The children are expected to acquire these competencies in the five-year long primary education, and they are referred to as the 'terminal competencies of primary education'. Out of the 53 competencies, there are five mathematical ones such as (i) To gain the basic ideas of number and to be able to use them (ii) To know the four fundamental operations and to be able to use them (iii) To apply the simple methods of computing/calculating in every-day life problem solving (iv) To know and to use the units of money, length, weight, measurement and time and (v) To know and understand the geometrical shapes and figures.

**Cem BABADOĞAN, Sinan ÖLKÜN** (2004) stated that Turkish primary mathematics curriculum adopted a mixed model while emphasizing the subject centred model in the content development and learner centred models in the pedagogies and assessment techniques. Content was organized based on how students learn, Daily use of mathematical knowledge is emphasized. There was more emphasis on how to develop positive attitude towards mathematics and on student

motivation. The content was presented with more emphasis on conceptual knowledge rather than procedural knowledge. Students were expected to count manipulatives, for example, before learning how to write numerals. Similarly, besides teaching how to add or subtract natural numbers, students were introduced with different meanings of operations and mathematical modelling of word problems. Again, more emphasis was given to different meanings of fractions and multiple representations of mathematical knowledge. Besides content, there were also changes in skills emphasized in the curriculum. For example, there were increasing emphasis on such macro skills as problem solving, reasoning, communications, connections, and information technologies as well as such micro skills as computation, mental calculation and estimation. These skills were not systematically handled in the old curriculum. As if, they were just accidentally scattered around. Lack of teacher training were the most important barriers in front of the new mathematics curriculum reform because there was little attention given to the teacher training in the whole process of reform.

## **2.5 Students achievement in mathematics:**

**ASPR (2013)** stated that learning achievement of children is the ultimate outcome of interest in the primary education sector. There are three national data sources on learning assessment. (i) NSA surveys (conduct in every two year). (ii) The Education watch CAMPE survey (conduct annually), but not regular after 2010 and (iii) The grade 5 Primary Education Completion Examination (since 2009 but test item not fully competency based yet).

**NSA report (2011)** concluded that Bangladesh has a primary education course of five years, with grades 1 to 5. With a view to improving the quality of education a competency-based curriculum, developed by NCTB, has been implemented in the primary schools. To improve the quality of education and pupil learning outcomes in cognitive and other skills, the DPE decided to conduct a series of National Assessments of Learning Achievement of primary pupils. The first in this series was conducted in 2006, and the study conducted in 2008 is the second one and NSA 2011 was the 3rd in the series. Tests in two subjects (Bangla and Mathematics) were conducted for Grade 3 and 5 pupils. All test instruments were developed by panels of specialists under the supervision of Directorate of Primary Education (DPE) and National Curriculum and Textbook Board (NCTB).

**NSA 2011:**

Half (50%) of students do not acquire competency in mathematics by the end of Class 3. One-thirds (33%) of students of Class 5 acquire competency in mathematics competencies. Both in Classes 3 and 5, rural students perform in mathematics is better than urban students. 52% and 32% rural students achieving relevant competencies in mathematics at class 3 and 5 respectively. Students in Government Primary Schools (GPS) perform better than students in Registered Non-Government Primary Schools (RNGPS) in both the class 3 and 5 in mathematics. In Class 5, 34% of the students perform competencies of Class 3 or lower in mathematics, implying that they are about 2 years behind in terms of cognitive development. National Student Assessment results 2011 in mathematics are shown in the table below.

**Table 2.1 : National Student Assessment results 2011 in mathematics**

Catagories		Mathematics	
		Grade 3	Grade 5
National mean score	Total	62	66
	Multiple choice questions	65	71
	Structured choice questions	52	56
	Boys	63	67
	Girls	61	66
	GPS	63	66
	RNGPS	60	63
Proportion of pupils who scored:	50% or more	72	76
	80% or more	27	31

**NSA 2008:**

The 2011 NSA is not comparable with previous results because test items and methodology was different from the 2006 and 2008 surveys. National Student Assessment results 2008 in mathematics are shown in the table below.

**Table 2.2 : National Student Assessment results 2008 in mathematics**

Catagories		Mathematics	
		Grade 3	Grade 5
National mean score	Total	59	63
	Multiple choice questions	76	78
	Structured choice questions	33	27
	Boys	59	64
	Girls	58	62
	Urban	58	65
	Rural	59	63
Proportion of pupils who scored:	50% or more	67	78
	80% or more	18	20

**2008 CAME survey :**

ASPR (2013) mentioned that the 2008 Education watch CAMPE survey establishes a long term trend in achievement because it used in the 2000 Education watch CAMPE survey. The test was administered to more than 7,000 Grade 5 students in 440 schools in 2008. Learning growth was highest in non-formal schools. Any subject wise score was not available at the CAMPE survey 2008.

**PECE result from 2009 to 2012:**

(ASPR 2011) mentioned that the Grade 5 scholarship examination was replaced by a nationwide terminal examination for the first time in 2009. It is the largest public examination in Bangladesh. The main objective of the terminal examination is to certify that a child has successfully completed the primary education cycle. It provides valuable insights to understand the level of performance in two respects as by school and by upzila.

The subject-wise stats show that students did not well in mathematics. In the PEC examination from 2009 to 2012 the pass rate in mathematics was the lowest among the subjects as shows in the table below.

**Table 2.3: Lowest and highest pass rate of PECE result in mathematics.**

<b>Year</b>	<b>Lowest pass rate (subjects)</b>	<b>Highest pass rate (subjects)</b>
2009	90.57% (mathematics)	99.46% ( Paribesh Parichiti Somaj)
2010	95.58% (mathematics)	99.56% (religion)
2011	98.19% (mathematics)	99.89% (religion)
2012	97.87% (mathematics)	99.85 (religion)

**Information source: DPE**



## **2.6 Study on students and teachers' Perception on mathematics:**

Jamieson-Proctor, Romina **and** Byrne, Carmen (2008) described the primary teachers beliefs about their use of mathematics text books as a factor influencing their teaching. Over 80% of the teachers indicated that they do not always' prefer to teach mathematics with a textbook and over 55% of the teachers surveyed reported 'Never' following the textbook's sequence of lessons, with no teachers indicating they 'Always' follow the textbook sequence. Teacher gender and years of experience do not significantly influence teachers' decisions to use student textbooks in mathematics. Many teachers believed that the student textbook is a valuable teaching and learning aid in the mathematics classroom and some teachers believed the use of text books makes teaching mathematics easier. The teachers hold very positive beliefs about their levels of confidence and competence to teach mathematics. The aim of the study was to determine what the contributing factors are that influence the teachers' decisions to use student textbooks in primary mathematics classrooms.

**Isil Isler. and Erdinc Cakiroglu ( 2009** indicated that teachers' area of certification and experience had a significant role on the collective dependent variables, gender did not. primary teachers had significantly stronger efficacy beliefs about the new curriculum than mathematics teachers. The study also revealed that, although found to be insignificant, teachers' efficacy beliefs about the new curriculum increased when teaching experience increased. The purpose of this study was to

investigate primary school and mathematics teachers' efficacy beliefs and perceptions in the context of the new primary mathematics curriculum in Turkey.

**Deborah J. Stipek!, Karen B. Givvin, Julie M. Salmon, Valanne L. MacGyvers.** (2001) assessed about beliefs and practices in mathematics . The study has found the substantial coherence among teachers' beliefs and consistent associations between their beliefs and their practices. Teachers' self-confidence as mathematics teachers was also significantly associated with their students' self-confidence as mathematical learners.

**Etuk N. Etuk, Maria E. Afangideh1& Asukwo O. Uya (2013)** revealed that the students' perceive their teachers' in terms of knowledge of mathematics contents, communication ability, teaching methods and classroom management skills has a significant relationship with students' attitude towards mathematics. When the students' perception of their teachers' characteristics is low, students' attitude towards mathematics tends to be negative. This has found that teachers competencies promote students positive attitude towards their school subjects and hence academic achievements.

**Anduaem Tamiru Gebremichael (2014)** stated the Students' perceptions about use of mathematics in other school subjects. Students expressed that math is just playing

with numbers but it has application in others , Science without mathematics it cannot believe, mathematics is useful for physics , logarithm used in chemistry, limit & derivative in physics.

**Farhan Azim, Shah Shamim Ahmed ( 2014 )** expressed the beliefs of mathematics teachers as the nature of mathematics, mathematics teaching, and mathematics learning where beliefs about mathematics teaching and learning are classified as traditional and contemporary. Here discussed about the concept of belief and how it is developed. Knowledge of mathematics is important for the teachers which is not enough to account for the differences between their instructional practices. Two teachers can have similar knowledge but their teaching approach will very different. It depends on the teachers' belief system concerning mathematics. The study suggests that beliefs are explicit or implicit feelings and assumptions that are developed by various kinds of personal experiences which might or might not be reflected in the actions of a person. The methodology of the study was mainly document analysis.

**Shirley M. Yate (2006)** focused the beliefs about mathematics teaching and learning, pedagogical practices and curriculum reform experiences. The study found that the teachers had also been encouraged to use Information and Communication Technologies in their mathematics classrooms. Teachers' beliefs about the nature of mathematics measured in the survey were not statistically significantly related to their beliefs about the teaching and learning of mathematics.

**Reidar Mosvold, Janne Fauskanger**( n.d. ) concluded that teachers believe that knowledge of definitions is an important aspect of teachers' knowledge. Several teachers maintained that remembering the actual definition is less important for them and some of the teachers said explicitly that knowing the formula or definition is not an important aspect of teachers' knowledge. Some teachers believe mathematical definitions are more important in the higher grades. The results of the study indicate that teachers believe knowledge of mathematical definitions is an important aspect of mathematical knowledge for teaching.

## **2.7 Teacher training in mathematics:**

**Ashrafuzzaman and Ehsan** (2011) told that qualified and trained teachers are needed to ensure quality education and different necessary steps will be taken. Scope of in-service training will be created ( National Education Policy 2010:8) . They also stated that to improve quality in education at primary level in Bangladesh importance of in-service training. In this purpose sub-cluster training has introduced since 1987. At first it is started for four upazilas and then from 1994 it is started as sub-cluster training for whole country.

**ASADUZZAMAN. Md.** ( n.d. ) found that the system of primary training program has been changed gradually from the 1990s' through 2000s'. The writer also found that 65% of URC trained teachers made mistake on fraction problem to some extent. It was revealed that trained teacher pedagogical skills was better than untrained teachers. In following issues they made effective use of teaching-learning materials in

mathematics and also they prepared the lesson plan for effective teaching, the teacher made the objective clear and understandable. It was investigated that URC training is of inadequate duration for completing training manuals, effectiveness of URC training, lack of trainer's competencies, insufficient training materials, and budget allocation is poor. The objective of this research was to analyze the present status of the teacher training program and the professional abilities such as content knowledge, pedagogical skills of URCs trained teachers.

**Mullick, Jahirul Islam; Sheesh, Sameeo.(2008)** stated that primary teacher training institutes (PTIs) are the sole agencies to offer in-service teacher development program for the primary school teachers in Bangladesh. At present, the URCs are organizing subject-based training for primary school teachers. There is another form of in-service training called sub-cluster training, which usually held on once in every two month. By nature the C-in-Ed curriculum is over-theoretical. It allows the trainee teachers a little time to engage in practice teaching. The writers also revealed that updated knowledge and contemporary information are absent in the current C-in-Ed curriculum which is not life and work oriented. The participants received C-in-Ed degree without getting intensive care and guidance from the supervisors during practice teaching. Insufficient classroom facilities, seating arrangement, teaching-learning materials and accommodation opportunities are the everyday-matters in PTIs.

**Asim Das, Toshio Ochiai.(2012)** stated that about the effectiveness of Certificate in Education (C-in-Ed) course in terms of teaching provided by PTIs based on the opinion of 142 trained teachers from the 56 primary schools of 4 southern districts in Bangladesh. The study revealed that about the weakness of the training such as lack of content on special educational needs, inadequate resource support, shortage of trainers, large class size in training hall, insufficient knowledge of trainers etc. This study will be helpful for future curriculum development process of teacher education.

**Bangladesh Education Sector Review Report No. 4, Teachers and Teacher Training (Formal and Non formal (2002)** stated that the poor quality of teaching is one of the key issues in the primary education sub-sector of Bangladesh. There are many development partners involved in primary sub-sector teacher development. The quality of the teacher and teaching has not improved at any noticeable level particularly due to the poor quality of training. There are many issues to address in our teacher training system at primary level. Bangladesh has fairly well established teacher training institutional system from the university level down to a cluster of schools in the village. Here the trainers are weak and have poor quality, and the process of training is far below the expected level. The C in Ed training has a curriculum and procedures listed but the minimum teacher competencies for a teacher to acquire during the training have not been specified. All training units--IER, NAPE, PTIs, URCs and the sub-clusters--suffer from the same weaknesses.

**UNESCO, (1993)** From the workshop it is concluded that in-service training of math teachers is needed for these purposes such as to upgrade teaching competencies and skills in mathematics, to update teachers' knowledge in these subjects, to enable teachers to implement new curricula and to familiarize teachers with new methods and approaches to teaching mathematics. Certain conditions have to be met in order to ensure the high quality and effectiveness of in-service training such as needs assessment, setting objectives, identification of trainers, development of quality materials, appropriate length of training, suitable training centers, interactive training activities, developing the capacity for independent learning, continuous feedback, follow-up and support activities. Evaluation should be done before, during and after the training.

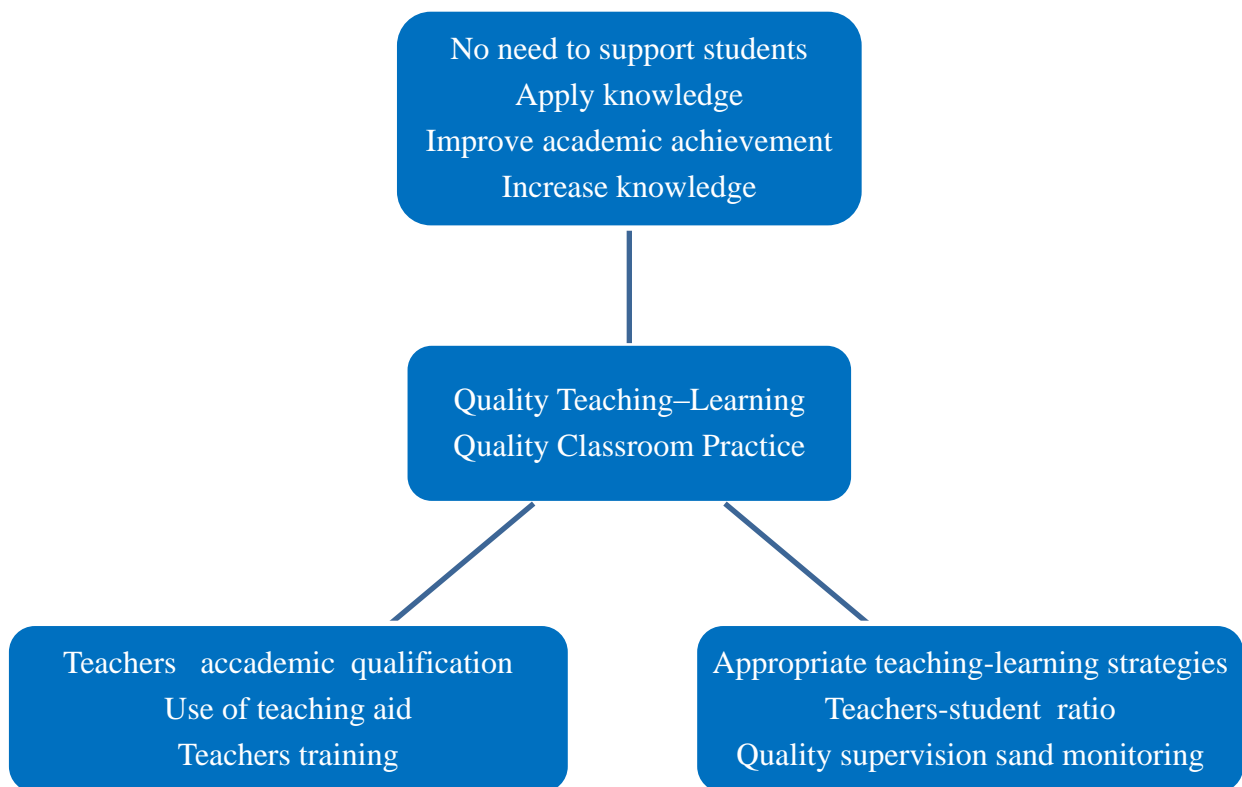
## **2.8 Theoretical Framework:**

Based on the above literature review the following theoretical framework has been developed by the researcher. A quality education is the preparation for working life, life in society and private life. The improvement of the quality of education depends on the quality teaching and learning with many other activities. Teaching is the arrangement of information. Learning is the development of new knowledge, skills, or attitudes. Appropriate class sizes, sufficient teaching materials, initial teacher education, teachers professional development, use of lesson plan, use of teaching aids, quality textbooks and teachers beliefs are the component of quality teaching-learning. The subject-wise status show that students did not well in mathematics.

In NSA 2011 half (50%) of the students did not acquire competency in mathematics at the end of Class 3 and one-thirds (33%) of students of Class 5 acquired competency in mathematics. In the PEC examination, from 2009 to 2012 the pass rate in mathematics was the lowest among the subjects. Memory-based teaching style and the inadequate teaching materials, Poor qualifications and lack of teacher motivation are major challenges among all other causes. Teachers did not pay attention to student difficulties and understanding level. No subject - based teaching found at the primary level in Bangladesh. Most of the teachers did not choose teaching profession as a first choice. Teachers work load affected teaching and implementation of quality primary education. Lack of preparation and the poor quality of training of teachers affects both teaching - learning and quality education. If mathematics teachers use group work, give individual attention to students and make their teaching interactive, then students' curiosity, enjoyment, and success in learning mathematics would increase. Teachers should have three interlinking strands (i) subject knowledge (ii) subject related pedagogy and (iii) classroom practice. Teaching method should be tailored according to student needs. For improving quality primary education subject-based training as the highest priority, then training in classroom management and the proper use of teaching aids was identified. Enhancement of salary structure and carrier path are the demand of time. The role of teachers' beliefs in mathematics and teachers' self-confidence as mathematics teachers was significantly associated with their students' self-confidence as mathematical learners. Qualified and trained teachers are needed to ensure quality education. Teachers have a key position in all



kinds of education. No measures are possible to improve education if the teachers are not thought of it. To improve quality teaching teacher have to give attention to everyone, use stimulating approach, use all memory lanes, ask question through eye contact, do not discriminate the students, show respect to everyone, avoid humiliating words and tone, highlight the strengths not the weakness.



**Figure 1: Theoretical frame work of the study**

# **CHAPTER 3**

# **METHODOLOGY**

## **CHAPTER 3**

### **METHODOLOGY**

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### **3.1 Introduction**

This chapter has five sections. First section describes about research design. Section two deals about population, sample and sampling technique. Section three focuses on tools. Section four focuses procedures used for data collection. Section five outlines the data analysis procedures.

**3.2 Research Design:** The design of a study is the researcher's plan of action for answering the research questions. Quality research design is to minimize possible errors by maximizing the reliability and validity of the data. Design is more than statistics and it requires insights. This study was designed to describe the actual picture of mathematics teaching and learning at primary level. This study was descriptive in nature and used survey tools. A mixed method approach, both quantitative and qualitative, was used to analyze the data collected for this study.

**3.3: Population:** All primary schools of Bangladesh were the population of this study. There are different types of primary schools totaling about 104417. Of these GPS is the largest one. So the target population of this study delimited to only GPS.

**3.4: The sample:** This section deals about the selection of samples and the number of samples such as school sample, teacher sample, class observation and student sample.

**3.4.1: School sample:** In Bangladesh there are 7 administrative divisions. It was decided to select samples at least from 4 divisions considering regional variations. The 4 divisions selected were Dhaka, Chittagong, Rajshahi and Barisal. From these 4 divisions 2 district were chosen conveniently. From each district 8 upazillas were

selected. Two schools were further selected from each upazillas considering rural and urban characteristics. Thus 16 schools were selected conveniently. Of them 6 were urban schools and 10 were rural schools.

**3.4.2: Teacher sample:** Two teachers from each school who teach mathematics in the classes three, four, five were selected as teacher sample. Thus the total numbers of teachers sample were 32. Among the 32 teachers, 6 were males and 26 were females.

**3.4.3: Class observation:** A total number of 32 classes from 16 schools were observed to explore the situation of teaching learning in the classes. Only those classes were observed where the sample teachers were teaching in the classes.

**3.4.4: Student sample:** From each sample school 3 students were chosen randomly, one from class three , one from class four and one from class five. Thus the total number of student sample was 48. Of these 48 students there were 25 boys and 23 girls.

The sample size is shown in the table 3.1

**Table 3.1 Selection of samples**

<b>Division</b>	<b>District</b>	<b>Upzilla</b>	<b>No. of GPS</b>	<b>No. of Math Teachers</b>	<b>No. of Students</b>
Dhaka	Gajipur	Tongi	01	02	03
			01	02	03
	Naraongong	Sonargaong	01	02	03
			01	02	03
Rajshahi	Rajshahi	Bagha	01	02	03
			01	02	03
	Bogra	Bogra sadar	01	02	03
			01	02	03
Chittagong	Comilla	Debiddar	01	02	03
			01	02	03
	Chandpur	Shaharasti	01	02	03
			01	02	03
Barisal	Barisal	Agailzara	01	02	03
			01	02	03
	Patuakhali	Doshmina	01	02	03
			01	02	03
<b>Total=04</b>	<b>08</b>	<b>08</b>	<b>16</b>	<b>32</b>	<b>48</b>

**3.5 Tools for Data collection:**

Mugenda and Mugenda (as cited in Absiye, 2013) stated that the most commonly used instruments in social sciences are questionnaires, interview schedules, observational forms and standardized tests. In this study for collection of data from the field the following tools were used.

- Questionnaire for Math Teachers
- Class Observation Schedule
- Interview schedule for Students
- Interview schedule for HTs

The following sub-sections discuss the development and description of the above mention tools.

### **3.5.1: Questionnaire for Math teachers:**

This tool is selected because it is the most common form of instrument for data collection and is used where respondents can read the questions and respond to them. To formulate questions content, structure, format and sequence were considered. Care was taken so that answer was single not dichotomous. The questionnaire consisted of a - total number of 32 items. Some questions were open-ended and some were close-ended .Open ended questions were specific where respondents could give their opinions and close- ended question have provided with pre-determined options which were mutually exclusive. Sufficient spaces were given to answer the open-ended question. A few questions were asked to know the personal information of the mathematics teacher such as name, age, gender, educational qualifications, experiences, training etc. Some questions were formed to know about mathematics teachers' belief on teaching-learning strategies in the classroom and what difficulties they have faced to ensure quality in the classroom. Open-ended questions were mainly asked to obtain suggestions for quality teaching-learning. Before preparing the questionnaire, the researcher has reviewed many questionnaires framed by other researchers. He also discussed with his supervisor and some other experienced mathematics teachers to choose the specific items in the questionnaire. In this way a draft questionnaire was prepared. A detailed questionnaire is given in the appendix 2.

### **3.5.2 Class Observation Schedule:**

This instrument was used to observe the teaching-learning activities of mathematics class. This observation was direct and non - participant. A-5 point rating scale was used to observe and rate items 11 to 20. In these items observation was made on pedagogy, teaching aids, group work, use of chalk-board, responsibility to slow learners, whether teacher discuss the lesson with question-answer process or continuous lecture, whether students follow the teacher or talk to each other etc. Items 1 to 10 were yes/no type. These questions mainly tried to elicit information about exchanging greetings, checking previous lesson, the use of lesson plan, encouraging asking question, appreciation of correct answer, the use of lesson plan, the evaluation after teaching in the class etc. Detailed observation schedule is placed in appendix B.

### **3.5.3: Interview Schedule for Students:**

An interview is a data-collection technique that involves oral questioning of respondents, either individually or as a group. A structured interview schedule was prepared to collect data from the students. The aim of this schedule was to know student's perceptions about mathematics teaching-learning. In this research, the interview schedule was virtually a structured questionnaire which consisted of a total number of 16 items. Only one question was open-ended asking about teaching aids used in the mathematics class room. All other questions were close-ended. Some items were used for getting information about schools and students such as name, class, roll number, gender etc. Some questions were asked to identify teachers' activities in the classroom such as teaching method, teaching aids, homework, about responsibility to



slow learners etc. Two questions were about starting and finishing activities of math teachers in the classroom. A few questions were about students' activities and their problems in the classroom.

#### **3.5.4 Interview schedule for HTs:**

This instrument was used to collect the learning achievement of students of class 3, 4, 5 from the result of annual examination of 2013. Some questions were introduced for demographic information about schools such as no of students, no of teachers, student-teacher ratio. One question about existing modern facilities, one question about supervision by AUEO. Finally an open-ended question was set for HTs about his steps to ensure quality teaching-learning in mathematics. The interview schedule was consisted of a total number of 13 items. A detailed interview schedule is given in the appendix D.

#### **3.6 Tri-angulation of data:**

Different types of tools and different types of respondents were used to collect the same data. These are as follows. To ensure quality teaching-learning in mathematics, suggestions were collected from math teachers and at the same time from Head teachers. Math teachers use teaching aid whether or not at the time of teaching, the information was collected both from teachers and students and also it was observed from class observation. Information was collected from math teachers, students and from the class observations about teachers' responsibility to the slow learners. Also the Information was collected from students and the class observations about teaching

activities such as continuous lecture method, question answer method, group work, to check previous lesson, evaluation after teaching and appreciate after giving correct answer etc. In this way most of the data were tri-angulated where triangulation is one of the measurements of reliability and validity for data.

### **3.7 Piloting:**

The data collection tools were pre-tested at 4 govt. primary schools in Dhaka city area which were not included in the actual study. The purpose of piloting was to ensure the validity and reliability of the tools for data collection. After collecting the data from pilot study it was found that respondents were confused to understand some of the questions in the tools. So the tools were revised on the basis of findings of the pilot testing. Some new items were also included in the tools to make it comprehensive and valid.

### **3.8 Procedure of Data collection:**

Data were collected from April to May in 2014. Researchers gathered different information about sample schools such as location of the school, duration of school time, schools examination period or running class period, sub-cluster program, head teachers meeting program etc. After reaching school, head teachers consent were taken about the purpose of the researcher. At first HTs interview were taken then according to the permission of HTs, researcher distributed questionnaire to 2 math teachers and they gave their opinion about the teaching learning activities, their problems, their perception on the quality of math teaching learning at primary level.

Then researcher observed the teaching-learning activities in the mathematics class of the same math teachers those who gave their opinion as math teachers. A full period was the duration of observation of math class as direct non-participant observer by using observation schedule. Finally students perception were taken about teaching-learning activities in mathematics class by using interview schedule from three students of each schools of class 3, 4, 5 who were selected randomly. No confusing or critical or personal questions were asked to the students that may hurt their mind. All sample students were asked same questions with same order. Normally data collections from a school were completed within one or two days, Researcher tried to minimize any systematic error, that occurs due to preparation of the instruments. Researcher himself was the observer and interviewer in most of the cases. So, it was possible to minimize the measurement errors. During data collection period, the experiences of piloting was always kept mind.

### **3.9 Ethical issues:**

- ❖ In respect of developing questionnaire for the mathematics teacher no question has been included so that they may be personally upset or bad tempered.
- ❖ The same awareness has been maintained in respect of preparing structured interview schedule for the Head Teachers and the learners.
- ❖ After informing the purpose of the research, the opinions have been taken with the consultations of the respondents.
- ❖ The participants had the full freedom of offering or not giving their opinions or withdrawing their given opinions.

- ❖ The respondents had the opportunity of using nick names in place of own names.
- ❖ The students were asked questions by taking the ages of the learners of primary schools in considerations.
- ❖ The permission was taken from the Head Teachers at the time of class observation.
- ❖ At the time of class observation no question was asked to the teachers or the young learners. Their teaching- learning activities were observed only from the back side of the class room.
- ❖ Only the records of the learners taken from the school record book through the Head Teachers have been used for verifying the learning achievement of the learners.
- ❖ No manipulation has been done in preparing results by analyzing information.
- ❖ For using all kinds of information, accurate references have been given.

### **3.10 Analysis and Interpretation of data:**

All the collected questionnaires, interview schedules and observation schedule were coded before analysis. Then the work of entry was done. Processing and recording (some cases) were done and then it was ready for analysis. Totally 88 points of information were analyzed under the 6 themes or major areas. Most of the areas were some sub areas. Thus a clear present situation of mathematics teaching-learning at

primary level was presented. Descriptive statistics were carried out for various categorical variables to get frequencies and percentages. Data were analyzed using computer program, Statistical Package for Social Sciences (SPSS). The results of data analysis were presented in form of tables, graphs and pie-charts. All graphs and pie-charts were made by using Excels.

# **CHAPTER 4**

## **ANALYSIS AND INTERPRETATION OF DATA**

## CHAPTER 4

### ANALYSIS AND INTERPRETATION OF DATA

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#### **4.1 Introduction:**

This chapter deals with the analysis and interpretation of data collected through three types of tools such as questionnaire, interview schedule and checklist. These instruments were administered to three categories of respondents namely Head Teachers (HT), Math Teachers (MT), Students and also for Classroom Observations. According to the sampling design of the study it was planned to collect data from 96 respondents of different categories. Of them 16 are HTs, 32 are MTs and 48 are students. Besides these, data were collected from 32 Classroom Observations.

Responses to each question were analyzed both in quantitative and qualitative terms as per suitability and the analyses are done under the following major areas:

1. Math Teacher's Qualifications and Experiences
2. Teacher's Beliefs about Quality Teaching-Learning
3. Teaching-Learning Activities in the Classroom
4. Student's Learning Achievement
5. Challenges to Ensure Quality Teaching-Learning
6. Suggestions to Improve Quality Teaching-Learning

#### **4.2 Math Teacher's Qualifications and Experiences**

Math teachers' are the important stakeholder of this study. Their educational qualifications, professional training, subject based training and experiences as a primary math teacher are shown in Table 4.1



**Table 4.1: Academic, Professional Qualifications and Experiences of Math Teacher's**

<b>Qualifications/Experiences</b>	<b>MTs (N=32) N</b>	<b>Percentage %</b>
<b><u>Academic</u></b>		
Post graduate	9	28.1
Graduate	18	56.3
HSC	5	15.6
<b><u>Professional</u></b>		
B.ED/M.ED	3	9.4
D.P.ED	3	9.4
C-in-ED	26	81.3
<b><u>Training in Mathematics</u></b>		
No training	14	43.8
5 or 6 days training	17	53.1
More than 6 days training	1	3.1
<b><u>Experience</u></b>		
Up to 10 years	22	68.8
11 to 20 years	3	9.4
21 to 30 years	7	21.9

Table 4.1 shows that more than majority of mathematics teachers (56.3%) have had bachelor degree, only 15.6% math teachers have had HSC and 28.1% math teachers have also master degree. The data indicates that a great majority of them (81.3%) possess C-in-ED but do not possess any professional degree such as Dip ED, B.ED or M.ED other than C-in ED.

It may be mentioned here that majority of the math teachers (68.8%) have up to 10 years of teaching experience as primary math teacher. Only 21.9% teachers have more than 20 years teaching experience possess. Midlevel experienced teachers are very short (9.4%) whereas they can give service with more energy because of their age.

There are no subject based teaching in mathematics at primary level in Bangladesh which is very important for quality teaching –learning. In the absence of subject based teaching at least subject based training are very essential. But the data indicated that huge numbers of math teachers have no training in mathematics, 53.1% teachers have only 5 or 6 days training in mathematics, only 3.1% have more than 6 days training in mathematics.

### **4.3 Teacher’s Beliefs about Quality Teaching-Learning**

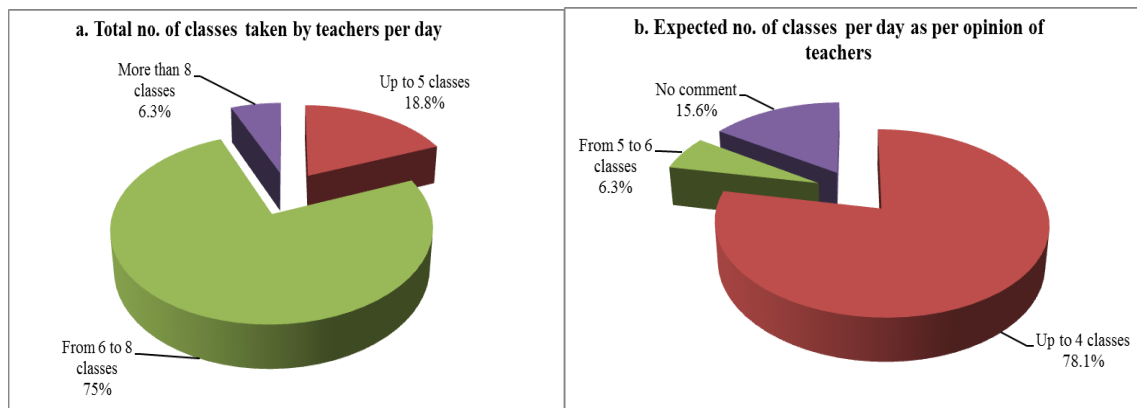
This sections are divided into four parts those are discussed as bellows such as Teacher’s work load, Math text book and class duration, Beliefs on corporal punishment and quality teaching – learning, Characteristics of quality teaching-learning.

#### **4.3.1 Teacher’s work load**

It is very difficult to maintain quality teaching when work load of teachers is high. In addition to teaching primary teachers have to do different types of duties. But here only work load is presented. Table 4.2 shows the current and expected work load.

**Table 4.2: Teacher's work load according to opinion of teachers**

Current work load per day			Expected work load per day		
No. of class taken daily	No. of teacher	Percentage	No. of class taken daily	No. of teacher	Percentage
Up to 5 classes	6	18.8%	Up to 4 classes	25	78.1%
From 6 to 8 classes	24	75%	From 5 to 6 classes	2	6.3%
More than 8 classes	2	6.3%	No comment	5	15.6%

**Figure 2 Teachers' beliefs on current work load and expected work load**

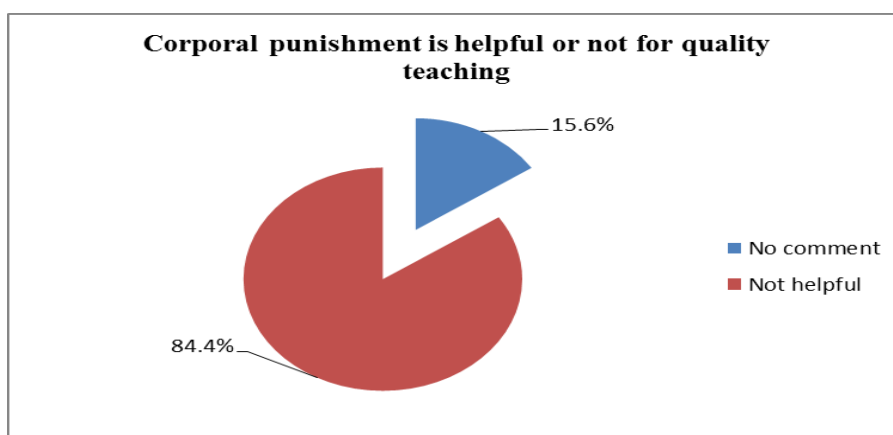
A great majority of the teachers (78.1% ) believe that for quality teaching expected number of daily class should be maximum up to 4, whereas, according to 75% teachers, present daily class is from 6 to 8 or even more. Figure 4.1 shows the information.

### 4.3.2 Math text book and class duration

On considering the content number and vertical and horizontal organizations of content of math text books are important for quality teaching – learning. A great majority of the teachers (71.9%) felt the present math book is more suitable. Regarding class duration majority teachers (65.6% ) said that present duration of math class was sufficient but some teachers thought that it should be extended to 50 minutes or more.

### 4.3.3 Beliefs on corporal punishment and quality teaching – learning:

Different types of punishment can impose for discipline but a great majority of the teacher (84%) beliefs that corporal punishment cannot ensure quality teaching – learning and they never give corporal punishment to the students’. Students’ attention has to be drawn by using different techniques. Figure 4.2 shows the opinion of math teachers about physical punishment.



**Figure 3: The opinion of math teachers about corporal punishment**

#### **4.3.4 Characteristics of quality teaching-learning**

The teachers were asked to give their opinions about quality teaching – learning. In response to these 16 teachers' (out of 32) said that the use of attractive teaching aid was very essential for quality teaching- learning in mathematics especially at primary level. On the other hand some opinions were on group work and appropriate use of teaching aid. Some teachers said about making lesson easy by correlation with real life situation, to teach by trained teachers, to teach by proper method, 'to identify the weakness of the slow learners' and guide them separately. On this same point the head teachers believed that the effective use of lesson plan and proper teaching aids could improve the quality of teaching – learning in mathematics.

#### **4.4 Teaching-Learning Activities in the Classroom**

To explore the teaching – learning activities 32 math classes were observed and the same 32 math teachers were asked who taught those classes and also 48 students were asked about math teaching – learning. At the time of class observation some observations were yes/no types which are shown in the table 4.3(a).

**Table 4.3(a): Activities of math teachers in the classroom according to class observation**

Activities	Yes		No	
	n	%	n	%
Teachers exchanged greetings	25	78.1	7	21.9
Teachers checked previous lesson	12	37.5	20	62.5
Teachers encouraged students to ask question	11	34.4	21	65.6
Teachers appreciated students after correct answer	30	93.8	2	6.3
Teachers gave homework by using chalk board	23	71.9	9	28.1
Teachers summarized lesson at the end of the class	8	25	24	75
Teachers evaluated students to check understanding	19	59.4	13	40.6
Teachers finished the lesson within proper time	28	87.5	4	12.5
Teachers used lesson plan	2	6.3	30	93.8
Teaching process was attractive	11	34.4	21	65.6

At the time of class observation some observations were at 5 point rating scale. Result of those observations is shown in the table 4.3(b) and also discussed below.

**Table 4.3(b): Activities of math teachers in the classroom according to class observation**

Activities	Never	Very little times	Some times	Most of the times	Always
	(N)%	(N)%	(N)%	(N)%	(N)%
Students listened teachers lecture	-	-	(9)28.1%	(23)71.9	-
Students was talking each other	(8)25%	(15)49.9	(6)18.8%	(3)9.4%	-
Students asked teacher	(13)40.6	(12)37.5	(5)15.6	(2)6.3	-
Teachers answered to all questions	(16)50	(4)12.5	(3)9.4	(7)21.9	(2)6.3
Students understood the instruction of teacher	-	(5)15.6	(16)50	(10)31.3	(1)3.1
Teachers gave lecture continuously	(1)3.1	(11)34.4	(14)43.8	(6)18.8	-
Teachers discussed with question answer	(1)3.1	(12)37.5	(15)46.9	(3)9.4	(1)3.1
Teachers worked with chalk board	(1)3.1	(9)28.1	(14)43.8	(6)18.8	(2)6.3
Teachers used any teaching aids	(17)53.1	(8)25.0	(6)18.8	(1)3.1	-
Teachers has given group works	(25)78.1	(5)15.6	(2)6.3	-	-
Students work in a group	(23)71.9	(5)15.6	(2)6.3	(2)6.3	-
Teachers moved to observe student works	(5)15.6	(14)43.8	(8)25.0	(3)9.4	(2)6.3
Teachers took care to slow learners	(19)59.4	(5)15.6	(4)12.5	(3)9.4	(1)3.1

Though all activities of teaching-learning were observed at the time of class observation and students were asked at interview schedule yet math teachers were also asked. The opinion of math teachers is shown in the table 4.4 and it is discussed below.

**Table 4.4: Classroom activities of math teachers according to their opinion**

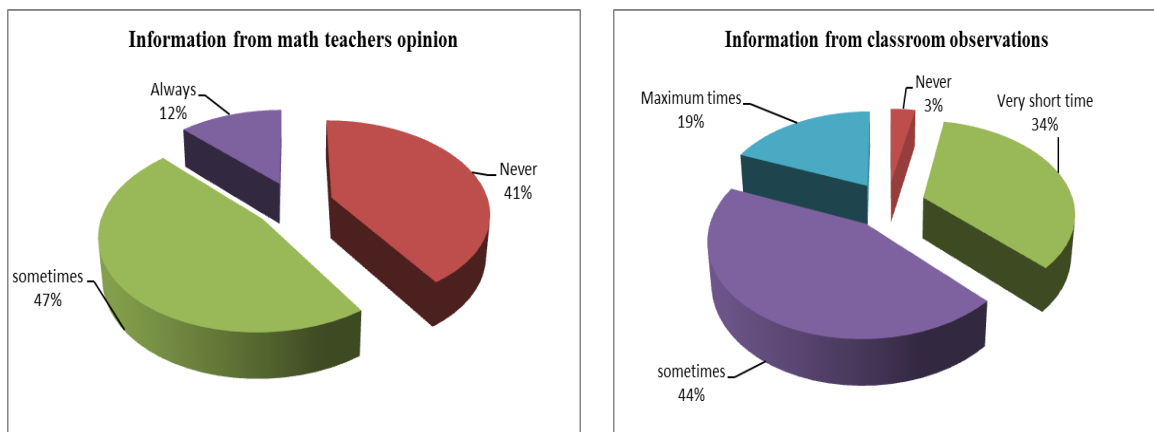
Activities	Never		Sometimes		Always	
	n	%	n	%	n	%
Teachers taught lecture method	13	40.6	15	46.9	4	12.5
Gave chance students to group work	1	3.1	10	31.3	21	65.6
Taught students by question answer process	-	-	8	25.0	24	75.0
Teacher gave thanks for correct answer	-	-	-	-	32	100
Evaluated students to check understanding level	-	-	3	9.4	29	90.6
Took care equally for all students	-	-	-	-	32	100
Helped personally to slow learners	-	-	3	9.4	29	90.6

#### **Exchange greetings and check previous lesson:**

To exchange greetings can create good relation with students and teachers which is helpful for quality teaching. According to class observation 78.1% teachers exchanged greetings always but 56.3% students said that it was sometimes. Previous knowledge is very helpful for quality learning. Students were asked this question, majority of the math teachers (62.5%) did not check previous lesson before teaching.

### **Teacher's use of lecture method:**

Lecture method is not modern teaching method but sometimes it is needed not always or maximum times. As a subject in mathematics teaching, lecture method is less appropriate than other subjects. Table 4.4 shows the math teacher's opinion and table 4.3(b) shows the information from the class observation about the use of lecture method only. According to math teachers opinion 13 teachers (out of 32) never used lecture method but it found from class observations only 1 (out of 32) teacher never used this method.



**Fig 4: Teacher use lecture method**

### **Group work:**

Group work is modern teaching method. It can be easily used in mathematics teaching . According to majority math teachers they always use this method. On the other hand from classroom observation researcher has found that 78.1% teacher never give group work to the students. Only a few teachers use this method sometimes. Students also asked this question and 72.9% student said that teachers never give them chance to work in group.



**Question answer process:**

It is very useful to attract students' attention in the classroom. If students can give his/her opinion, they enjoy, participate actively and follow the teacher. Sometimes teacher add information with the students in this process. According to math teachers' opinion great majority of the teachers (75%) used this process always whereas researcher found from class observations 15 (out of 32) teachers used this process sometimes and only 1 (out of 32) teacher used this process always. From table 4.3(b), 4.4 it is more clear.

**Thanks for correct answer and to show equal attitude for all:**

It is very important to appreciate the students for correct answer and teacher should show equal attitude for all. Any discrimination hurt the students. According to math teachers 100% teacher give thanks to the students for correct answer. From class observation it was about same result. Beside this math teachers said that all teachers always show equal attitude for all.

**Summarize the lesson and evaluation after teaching:**

Researcher has found that most of the teachers summarized the lesson at the end of the class which was very good sign for teaching learning system. Again from table 4.3(a) shows that more than fifty percent students (62.5%) said that math teachers evaluated students sometimes but class observations shows that 19 teachers (out of 32) teachers evaluated students always at the end of the class.

**Responsibility to slow learners:**

Responsibility to slow learners is the important characteristics of quality teaching-learning. 90.6% math teachers maintain this responsibility always according to their opinion but students said that most of the teachers maintain this responsibility sometimes whereas from class observations it is found that more than fifty percent math teachers never maintain this responsibility.

**Use of teaching aids:**

Use of teaching aids can play an important role in teaching – learning of mathematics. Teaching of mathematics is always challenging. Most of the things here abstract. Specially it is very difficult to teach at primary level. In this case, effective use of proper and attractive teaching aids can make it very easy. Besides the class observation math teachers were also asked about the use of teaching aids in the classroom.

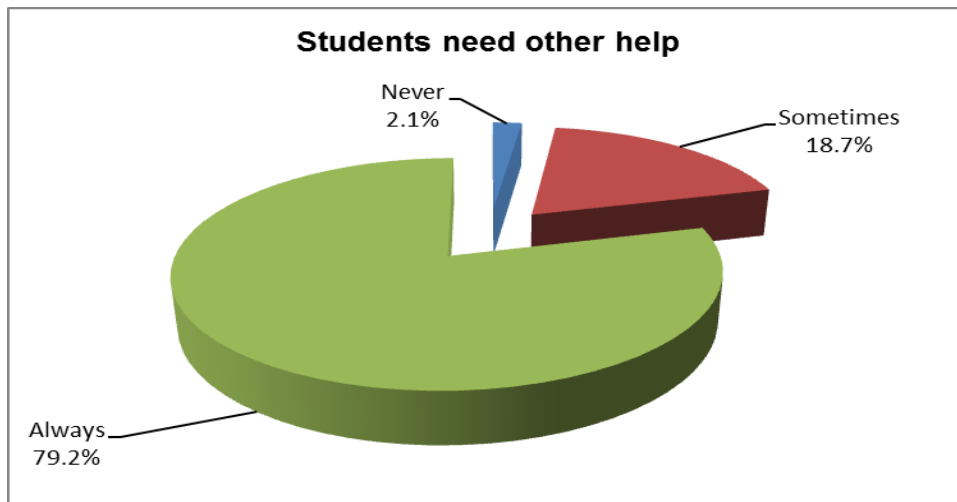
**Table 4.5: Teachers used teaching aids according to their opinion**

Teaching aids	Never		Very little time		Sometimes		Always	
	n	%	n	%	n	%	n	%
Chalk board	-	-	-	-	5	15.6	27	84.4
Chart	-	-	-	-	16	50.0	16	50.0
Model	-	-	4	12.5	27	84.4	1	3.1
Geometry box	-	-	1	3.1	23	71.9	8	25.0
Real things	-	-	5	15.6	23	71.9	4	12.5
Multimedia	28	87.5	4	12.5	-	-	-	-

Table 4.5 shows that according to the opinion of math teachers, a great majority of the teachers (84.4%) always used chalkboard, 50% teacher used chart as teaching aid sometimes and 50% teacher used it always, a great majority of the math teachers (84.4%) used model as teaching aids sometimes, 71.9% math teachers used geometry box as teaching aids sometimes. Use of modern technology such as multimedia, internet, digital content as teaching aids is very limited. From class observation researcher found majority (53.1%) of the math teachers never used teaching aids. Students were asked about the use of teaching aids, majority of the students stated that teacher used nothing as teaching aids. But a few students said that teacher used pen, picture, chart, scale, paper, stick, geometry box etc. as teaching aids sometimes.

### **Other help in home:**

When students understand the lesson in the class they don't need other's help though some students take other's help to understand more. Some students who are slow learners may need other's help. Maximum students would not need. Figure 4.4 shows that a great majority of the students (79.2%) need other's help in home which indicates the weakness of the teaching-learning system.



**Figure 5: Students need other help**

### **Home work:**

Table 4.3(a), 4.3(b) shows that most of the teachers give homework by using chalk board but only a teachers never give homework. Here information from students and class observation differ slightly. According to students opinion some teachers always check homework and most of the teachers sometimes check homework.

### **Use of lesson plan:**

Lesson plan guide the teacher with respect to class duration, class size, students understanding level etc. So it can improve the quality of teaching. Most of the teachers (93.8%) did not use the lesson plan formally though lesson plan can also maintain informally.

**Student ask question to the teacher:**

From 13 classes (out of 32) it is found that students ask nothing about lesson in the class, a few students asked sometimes. On the other hand students were asked this question, majority (62.5%) of the students said that they asked to teacher sometimes.

**Teacher encouraged students to ask question:**

Table 4.3(a) shows that from class observations it is found that majority of the teachers (65.6%) never encouraged students. the result whereas 70.8% students said that math teachers encouraged them sometimes.

**4.5 Student's Learning Achievement**

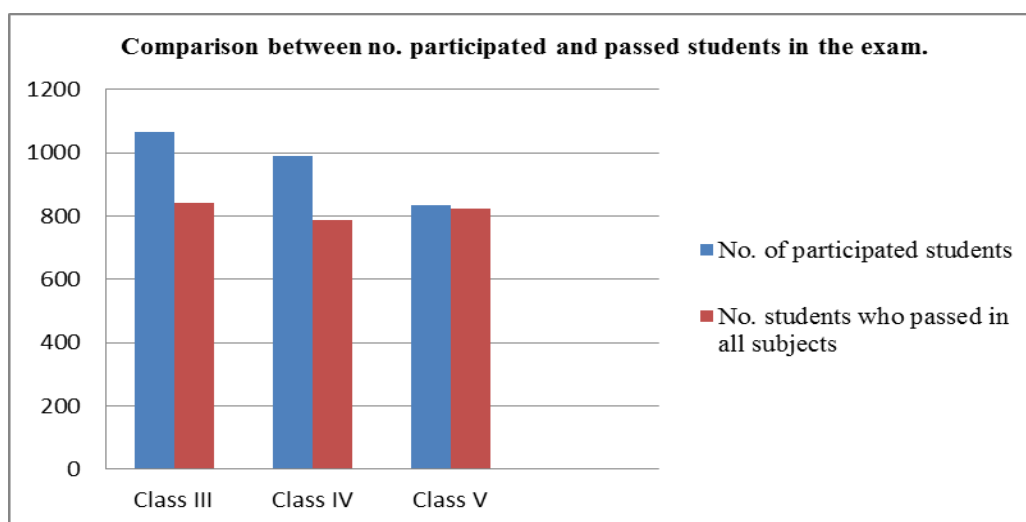
Student learning achievement is one of the important measurements of quality teaching – learning. Table 4.6 shows the learning achievement in mathematics at annual/PEC examination of 2013.

**Table 4.6: Student learning achievement in mathematics at annual/PEC exam. of 2013**

Name of the class	No. of school	No students appeared of 2013 examination		No of students passed in six subjects		No of students failed in different subjects		No of students failed in mathematics (out of 227 failed students)	
		Annual	PEC	Annual	PEC	Annual	PEC	Annual	PEC
Class III	16	1067	-----	840 (78.7%)	-----	227 (21.3%)	-----	202 (88.9%)	-----
Class iv	16	989	-----	788 (79.7%)	-----	201 (20.3%)	-----	160 (79.6%)	-----
Class v	16	-----	834	-----	825 (98.9%)	-----	9 (1.1%)	-----	7 (77.7%)

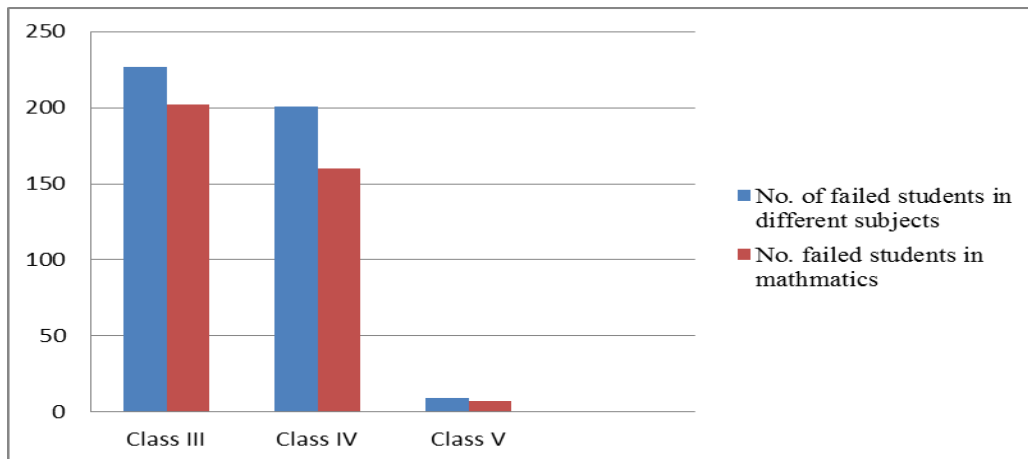
Source: School record

Though maximum students have passed but large numbers of students have failed in different subjects. Out of participated students 78.7% , 79.7% , 98.9% were passed in all subjects of class iii, class iv and class v respectively. Rests of the students were failed in different subjects. The comparison between participated students and passed students in all subjects are shown in the figure 4.6 below.



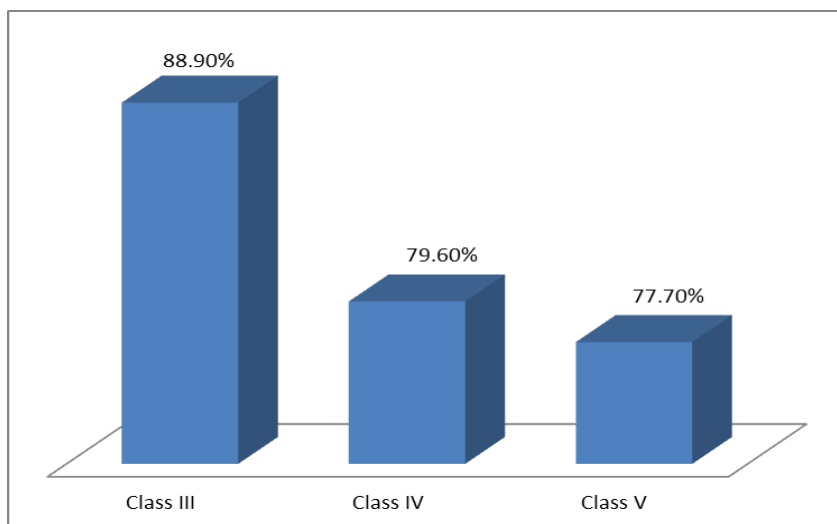
**Figure 6: Comparison between no. participated and passed students in the exam.**

It is noted that most of the students who failed in different subjects have failed in mathematics. Totally 227 students failed in different subjects whereas 202 students failed in mathematics at class three. In the same way out of 201 failed students in different subjects 160 students failed in mathematics at class four and from 9 failed students in different subjects 7 students failed in mathematics at class five. Figure 4.7 shows it's below.



**Figure 7: No of failed students in different subjects and failed students in mathematics**

From class three out of the number of failed students in different subjects 88.9% students failed in mathematics. It was 79.6% for class four and 77.7% for class five. It indicates the learning achievement situation in mathematics at primary level. At class five the number of failed students is the lowest from class three to five. Because teachers give more attention only for class five as a result other classes are ignored automatically which will create new problems in future. This result shows the figure 4.8 below.



**Figure 8: Percentage of the failed students in mathematics out of failed in different subjects**

## **4.6 Challenges to Ensure Quality Teaching-Learning**

There are different challenges to ensure quality teaching – learning in mathematics at primary level in Bangladesh such as student teacher ratio, lack of quality supervision, teachers' work load, lack of subject based teacher , lack of subject based training, scarcity of teaching aids and job satisfaction of teachers. The following sub section describes the findings.

**4.6.1 High student teacher ratio:** According to HTs number of student against per teacher were different in different schools where minimum 34, maximum 71 and average number of student per teacher is 52.6.

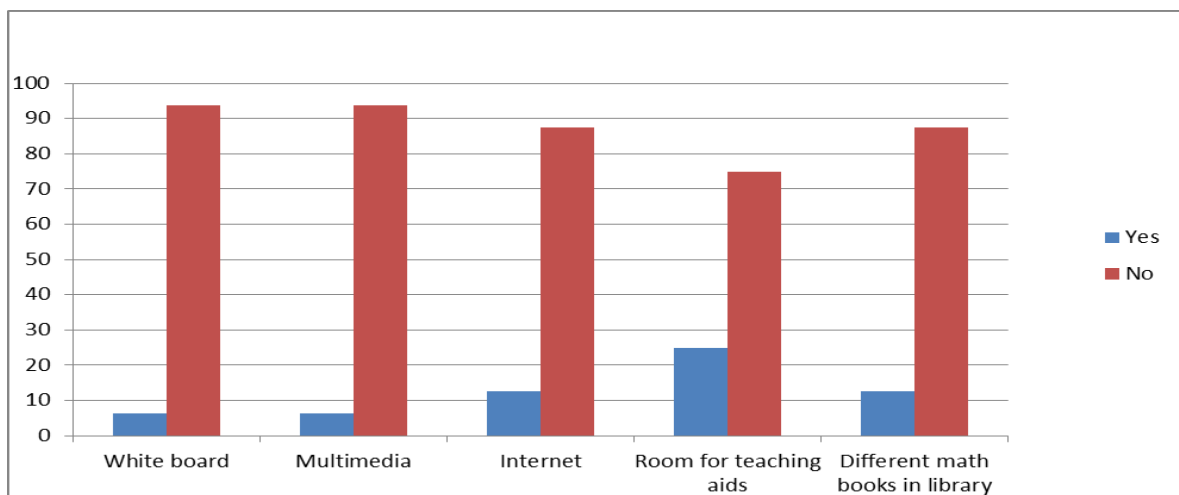
**4.6.2 Lack of quality supervision:** More than fifty percent (56.3%) head teachers said that ATEO visit every school once in a month, though somewhere it is more than once in a month but 25% cases it is less than once in a month which is not sufficient to ensure quality teaching learning.

**4.6.3 Lack of modern teaching aid facilities:** The HTs were asked to inform about modern teaching facilities in their schools. Their responses are tabulated in table 4.7 From table it is seen that a few school have white board, multi-media, internet and supplementary math books Only 4 schools ( out of 16) have extra rooms for teaching aids.

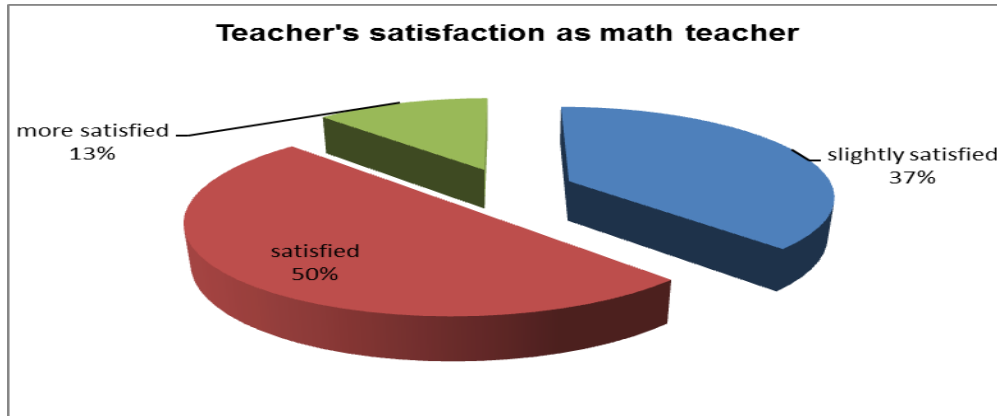


**Table 4.7 : Lack of modern teaching aid facilities**

Facilities in schools	Yes		No	
	n	%	n	%
White board	1	6.25	15	93.75
Multimedia	1	6.25	15	93.75
Internet	2	12.5	14	87.5
Room for teaching aids	4	25.0	12	75.0
Different math books in library	2	12.5	14	87.5

**Figure 9: – Modern teaching aid facilities (according to percentage)**

**4.6.4: Job satisfaction:** Job satisfaction is very needed for quality service. Math teachers were asked about their job satisfaction level. Only 4% teachers were more satisfied as a primary math teacher where huge no of teacher is slightly satisfied or not satisfied.



**Figure 10: Teachers satisfaction as math teacher**

#### 4.7 Suggestions to Improve Quality Teaching-Learning

- ❖ According to the great majority of head teachers (70.59%), math teachers' should use lesson plan and proper teaching aids effectively which can improve the quality teaching - learning in mathematics. Some head teachers suggested that math teachers should identify the weakness of the slow learners' and then guide them separately.
- ❖ Math teachers suggested that use of puzzles, group work, jokes, rhymes songs, stories, example of the renowned persons, mathematical games etc. can attract the student's attention in the class. For quality teaching subject based trained teacher should teach subject wise.
- ❖ According to math teachers some measure should be taken to develop weak students such as to teach by good learners, to arrange special class separately, to practice same thing more and more.

- ❖ Math teachers said that examples of all categories should be set in all chapters in math books. Some teachers suggested that creative question should introduce in the math books at primary level.
- ❖ Some math teachers said that it is needed to reduce high student teacher ratio, big class-size and develop the environment of class room for quality teaching-learning.
- ❖ For attractive math teaching – learning at primary level, lesson related attractive teaching aids should be supply from URCs or PTIs.

# **CHAPTER 5**

## **FINDINGS AND RECOMMENDATION**

## **CHAPTER 5: FINDINGS AND RECOMMENDATION**

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## 5.1 Introduction:

This chapter presents a summary of major findings along with some recommendations and conclusion. A suggestion for further research for overall improvement of quality teaching -learning in mathematics at primary level in Bangladesh is also given.

## 5.2 Major findings:

- According to class observation a great majority (78.1%) of the math teachers exchanged greetings with students at the beginning of class and most (93.8%) of the them appreciated students after giving correct answer.
- Majority of the math teachers (56.3%) have had bachelor degree and 28.1% of math teachers possessed master degree but only a few (15.6% ) math teachers had HSC.
- Most of the math teachers (81.3%) possess C-in-ED but do not possess any professional degree such as Dip ED, B.ED or M.ED other than C-in ED.
- Majority of the math teachers (53.1%) teachers have only 5 or 6 days training in mathematics, but only a few (3.1%) have more than 6 days training in mathematics.
- A great majority of the math teachers (84%) believed that corporal punishment would not ensure quality teaching-learning.
- Majority of the math teachers (62.5%) did not check previous lesson before teaching.

- According to class observation only 3% teacher never used lecture method continuously.
- 40.6% of students never asked teacher in the classroom and majority (65.6%) of the math teachers did not encourage students to ask question about their lesson.
- A great majority (71.9%) of the math teachers gave homework always but some (60.4%) teachers checked sometimes.
- 41.18% of head teachers advised math teachers that to identify the weaknesses of the students it is necessary to guide them separately. A great majority of (70.59%) head teachers suggested math teachers that effective use of lesson plan and proper teaching aid could improve the quality teaching-learning in mathematics.
- A great majority (75%) of the math teachers did not summarize the lesson at the end of the class and majority (62.5%) of the math teachers did not check previous lesson but 62.5% teachers evaluated the students at the end of the class.
- A great majority (79.2%) of the students need other's (school teacher, other tutor or any family member) help in home to solve their homework or prepare them for examinations.
- A great majority of the math teachers (75%) had to take 6 to 8 class daily, whereas 78.1% teachers believed it should be up to 4 classes daily. Besides this they had to teach different subjects daily because there was no subject based

teaching provision at primary level in Bangladesh.

- Majority math teachers (65.6%) said that present duration of math class was sufficient but some teachers thought that it should be extended to 50 minutes or more.
- Researcher has found from classroom observation that 78.1% of teachers never gave group work to the students. Only a few teachers used this method sometimes.
- Only 3.1% math teachers always used question answer process practically whereas 75% math teachers claimed that they always used this process.
- Use of modern technology such as multimedia, internet, digital content as teaching aids was very limited. Though math teachers claimed that they used different teaching aids always but from class observation researcher found that majority (53.1%) of the math teachers never used teaching aids. According to the opinion of students, majority of the teachers used nothing as teaching aids whereas a few students said that teacher used pen, picture, chart, scale, paper, stick, geometry box etc. as teaching aids sometimes.
- Number of student per teacher were found to be minimum 34 in number, maximum 71 and average number of student per teacher was 52.6 .
- Most (90.6%) of the math teachers demanded that personally they helped slow learners but from class observations it was found that majority (59.4%) of the teachers never took care of slow learners.



- Out of failed students in different subjects, most of the students failed only in mathematics. Among them 88.99% students belong to class three, 79.6% class four and 77.77% class five.

### **5.3 Recommendation:**

1. Student teacher ratio should be reduced by appointing new teacher. Because one measure of quality education is the student teacher ratio. In Bangladesh our target is 40 students per teacher against per teacher. In contrast, the average student teacher ratio in the developed countries is 13.7, in southern asia (37.8), in western asia (17.8) and the global average is 24.6, (Friedrich Huebler, 2008). No methods can apply appropriately when classroom is crowded. Teachers of a large class can dedicate less time to each student than in a small class.
2. If possible try to maintain subject based teaching otherwise at least subject based training should be available for all math teacher. One person cannot expert in different subjects. It is very difficult to teach different subjects even after subject based training.
3. Quality based supervision should be improved by head teacher and AUEO. A proper supervision can help to implement and maintain quality in teaching-learning. For this quality training is needed for supervisors.
4. Math teacher's opinion and beliefs about quality teaching learning were very good but their practices in the classroom teaching were different which should

be minimizing by motivation.

5. The authority should be reviewed upwards the salaries, carrier path should be create and increase the hardship allowances of teachers in order to motivate the teachers to work hard in the implementation of quality of mathematics teaching learning.
6. Chapter wise attractive and quality teaching aids can be supplied centrally. Because attractive and appropriate teaching aids can think and prepare by experienced expert resource persons which is difficult for primary level teachers.
7. To encourage math teachers can be categorized and introduced prizes and certificates according to their performance.
8. The facilities of modern technologies should be available and digital content can be prepared and supplied centrally.

#### **5.4 Conclusions:**

Based on the findings of the study, it can be concluded that quality of mathematics teaching learning are being affected by several issues. The most affected issues are student-teacher high ratio, inadequate subject based training of teachers, huge work load, lack of subject based teaching, lack of the proper selection of teaching aids and the use of these teaching aids effectively.

The study also concludes that inadequate supervision, dissatisfaction of job as primary teacher, weakness of the basic (C in ED) training. Because of the weakness of the

training- teacher himself cannot define characteristics of quality teaching. Lack of proper teaching practice of the classroom like using of lesson plan, encouraging students to ask question, summarizing lesson and evaluating the classroom teaching ,group working, caring for slow learners, checking students' homework can be mentioning. The picture of actual mathematics teaching learning has been made in the light of the reports provided by head teachers, math teachers, students and class observations. This study has also found imbalanced among the math teachers statement about their classroom activities, students opinion and practical observation.

#### **5.5 Suggestions for further research:**

Someone can investigate the impact of SMC role, PTA role, curriculum, textbook, evaluation system, teacher's training, supervision, teacher belief, job satisfactions, cordiality of teachers, physical facilities of classrooms on quality of mathematics teaching learning. Beside these another study can survey the opinion or beliefs of different stakeholder such as Educationist, Subject specialist, Training specialist, Parents about quality of mathematics teaching and learning.

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# **ANNEXURES**

## ANNEX – A

**Quality of Mathematics Teaching and Learning  
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গণিত শিক্ষকের জন্য প্রশ্নোত্তরিকা

- ১। শিক্ষকের নাম:------(ছদ্ম নাম ব্যবহার করতে পারেন)
- ২। বয়স:-----বছর -----মাস।
- ৩। লিঙ্গ: ১. মহিলা :-----২. পুরুষ:-----
- ৪। সর্বোচ্চ শিক্ষাগত যোগ্যতা:-----
- ৫। পেশাগত যোগ্যতা: ১. সি-ইন-এড-----২.ডিপিএড-----৩.বিএড-----৪.এমএড-----৫.অন্যান্য-----
- ৬। প্রাথমিক শিক্ষক হিসাবে চাকুরির মোট অভিজ্ঞতা:-----বছর-----মাস
- ৭। স্নাতক ডিগ্রী ধারী হলে পঠিত বিষয় সমূহ : -----
- ৮। স্নাতকোত্তর ডিগ্রী ধারী হলে পঠিত বিষয় : -----
- ৯। গণিতের উপর বিষয় ভিত্তিক কোন প্রশিক্ষনে অংশগ্রহণ করেছেন কি? ১. হ্যাঁ----- ২. না-----
- ১০। ৯নং প্রশ্নের উত্তর হ্যাঁ হলে প্রশিক্ষনের ধরন: ১. নাম----- ২. সময় (দিন):-----
- ১১। আপনি গণিত ছাড়া আর কোন বিষয়ে পাঠদান করেন: -----
- ১২। প্রতিদিন গড়ে কয়টি ক্লাশ নেন?-----
- ১৩। কোন কোন শ্রেণিতে গণিত পাঠদান করেন? -----
- ১৪। আপনি যে শ্রেণিতে গণিত পাঠদান করেন সেখানে শিক্ষার্থীর সংখ্যা:

শ্রেণি	শিক্ষার্থী সংখ্যা

- ১৫। গণিত বিষয়ে গুণগত শিক্ষন-শিখনের কিছু উল্লেখযোগ্য বৈশিষ্ট্য উল্লেখ করুন। -----  
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১৬। গণিত ক্লাশে গুণগত শিক্ষন- শিখন নিশ্চিত করতে আপনি কি কি অসুবিধার সম্মুখীন হন ? (V চিহ্ন দিন)

ক) সঠিক পদ্ধতি নির্বাচন করতে অসুবিধা হয়। খ) অধিক সংখ্যক ক্লাশ নিতে হয়।

গ) বিভিন্ন বিষয়ে পাঠদান করতে হয় ঘ) উপকরনের সঠিক ব্যবহার করতে না জানা।

চ) উপকরন সহজে যোগাড় করা যায় না। জ) শ্রেণিতে শিক্ষার্থীর সংখ্যা অনেক বেশি।।

ঞ) প্রশিক্ষন না থাকা। ত) শ্রেণি কক্ষে হোয়াইট বোর্ড , মাল্টিমিডিয়া , কম্পিউটার ও ইন্টারনেট সুবিধা না থাকা।

১৭। দৈনিক গড়ে কতটি ক্লাশ নিলে এক জন গণিতের শিক্ষক গুণগত দিক রক্ষা করতে পারবেন বলে আপনি মনে করেন ?

১৮। গণিত বিষয়ে একজন পাঠদানকারী শিক্ষক হিসাবে আপনি কতটা সন্তুষ্ট ?

মোটেরই সন্তুষ্ট নই	মোটামুটি সন্তুষ্ট	সন্তুষ্ট	যথেষ্ট সন্তুষ্ট
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১৯। উত্তর মোটেরই সন্তুষ্ট না হলে কারন লিখুন :: -----

২০। গণিত পিরিয়ডের জন্য বর্তমানে নির্ধারিত সময় আপনি যথার্থ বলে মনে করেন কি? হ্যাঁ / না

২১। উত্তর না হলে সময় কত মিনিট হতে পারে বলে আপনি মনে করেন : ----- মিনিট

২২। গণিত ক্লাশে শিক্ষার্থীদের মনোযোগ ধরে রাখতে আপনি যে সকল কৌশল অবলম্বন করে থাকেন তার কয়েকটি উল্লেখ করুন : -----

২৩। প্রাথমিক বিদ্যালয়ে গণিত শিক্ষাদানকে আরও আকর্ষণীয় করতে আপনার কোন সুপারিশ থাকলে উল্লেখ করুন : --

২৪। পাঠদানকালে নিম্নলিখিত কাজগুলো আপনি কী মাত্রায় করে থাকেন।

কাজ	কখনো না	মাঝে মাঝে	গর্বসময়
ক) শ্রেণিতে বক্তৃতা পদ্ধতিতে পাঠদান করি			
খ) শিক্ষার্থীদের দলগত আলোচনার সুযোগ দেই			
গ) প্রশ্নোত্তরের মাধ্যমে পাঠদান করি			
ঘ) সঠিক উত্তর দিলে প্রশংসা করি			
ঙ) পাঠ আয়ত্ব করতে পেরেছে কিনা তা জানার জন্য মূল্যায়ন করি			
চ) সবার প্রতি সমান নজর দিই			
ছ) দুর্বল শিক্ষার্থীদের ব্যক্তিগতভাবে সাহায্য করি			

২৫। পাঠদানকালে নিম্নলিখিত শিক্ষা উপকরণ গুলো আপনি কী মাত্রায় ব্যবহার করে থাকেন।

উপকরণ	খুব কম সময়	মাঝে মাঝে	সবসময়
চকবোর্ড			
চার্ট			
মডেল			
জ্যামিতিক যন্ত্রপাতি			
বাস্তব বস্তু			
মাল্টিমিডিয়া			

২৬। দুর্বল ছাত্রদেরকে গণিত ভালভাবে শিখানোর জন্য কি পদক্ষেপ গ্রহণ করেন ?

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২৭। বর্তমানে প্রচলিত গণিতের পাঠ্য বই শিক্ষার্থীদের গণিত শেখানোর জন্য কতটা উপযোগী ?

১. তেমন উপযোগী নয়	২. কিছুটা উপযোগী	৩. যথেষ্ট উপযোগী
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২৮। গণিতে পাঠ্যবই উন্নত করার ক্ষেত্রে আপনার বিশেষ কোন সুপারিশ থাকলে লিখুন। -----

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২৯। গণিত পাঠদানের ক্ষেত্রে আপনি শিক্ষক নির্দেশিকা ব্যবহার করে থাকেন কি?-----

৩০। উত্তর না হলে কারণ লিখুন : -----

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৩১। গণিত ক্লাশে পাঠদান করার সময় আপনি শিক্ষার্থীদেরকে কোন শারিরিক শাস্তি দেন কি?-----

৩২। শারিরিক শাস্তি প্রদান শিক্ষার্থীদের গণিত ভাল শিখনের জন্য সহায়ক কি না লিখুন। -----

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ANNEX – B

Quality of Mathematics Teaching and Learning  
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শ্রেণীকক্ষ পর্যবেক্ষন পত্র

স্কুলের নাম:-----উপজেলা:-----জেলা:-----  
শ্রেণি:-----বিষয়:-----শ্রেণির শিক্ষার্থীর সংখ্যা:-----শ্রেণির উপস্থিত শিক্ষার্থীর সংখ্যা:-----  
সময়:----- থেকে----- পর্যন্ত

১. শিক্ষক কুশল বিনিময় করেছেন ? হ্যাঁ / না
২. শিক্ষক পূর্ব পাঠ যাচাই করেছেন ? হ্যাঁ / না
৩. শিক্ষার্থীদের প্রশ্ন করতে উৎসাহিত করেছেন ? হ্যাঁ / না
৪. শিক্ষার্থীরা সঠিক উত্তর করলে শিক্ষক প্রশংসা করেছেন ? হ্যাঁ / না
৫. চকবোর্ডে বাড়ির কাজ লিখে দিয়েছেন ? হ্যাঁ / না
৬. পাঠশেষে শিক্ষক পাঠের সারসংক্ষেপ করেছেন ? হ্যাঁ / না
৭. শিক্ষার্থীরা পাঠ কতটুকু বুঝতে পেরেছে তা যাচাইয়ের জন্য মূল্যায়ন করেছেন ? হ্যাঁ / না
৮. শিক্ষক নির্ধারিত সময়ের মধ্যে পাঠ সমাপ্ত করেছেন ? হ্যাঁ / না
৯. শিক্ষক নিজের তৈরী পাঠটীকা ব্যবহার করেছেন ? হ্যাঁ / না
১০. পাঠদান প্রক্রিয়া আকর্ষণীয় ছিল ? হ্যাঁ / না

নির্দেশনা : ১= কখনো না ২= খুব অল্প সময় ৩= মাঝে মাঝে ৪= অধিকাংশ সময় ৫= সব সময়

পর্যবেক্ষনের বিষয়	১	২	৩	৪	৫
১১. শিক্ষার্থীরা মনোযোগের সাথে শিক্ষকের কথা শুনেছে	১	২	৩	৪	৫
১২. শিক্ষার্থীরা নিজেদের মধ্যে কথা বলেছে	১	২	৩	৪	৫
১৩. শিক্ষার্থীরা প্রশ্ন করেছে	১	২	৩	৪	৫
১৪. শিক্ষক সব শিক্ষার্থীর প্রশ্নের যথাযথ উত্তর দিয়েছেন	১	২	৩	৪	৫
১৫. শিক্ষকের নির্দেশনা শিক্ষার্থীরা ঠিকমতো বুঝতে পেরেছে	১	২	৩	৪	৫
১৬. শিক্ষক একতরফা বক্তৃতা করেছেন	১	২	৩	৪	৫
১৭. প্রশ্নোত্তরের মাধ্যমে আলোচনা করেছেন	১	২	৩	৪	৫
১৮. শিক্ষক চকবোর্ডের কাজ করেছেন	১	২	৩	৪	৫
১৯. শিক্ষক উপকরণ ব্যবহার করেছেন	১	২	৩	৪	৫
২০. শিক্ষক দলগত কাজ দিয়েছেন	১	২	৩	৪	৫
২১. শিক্ষার্থীরা দলীয় কাজে অংশগ্রহণ করেছে	১	২	৩	৪	৫
২২. শিক্ষক শিক্ষার্থীদের কাজ ঘুরে ঘুরে দেখেছেন	১	২	৩	৪	৫
২৩. শিক্ষক দুর্বল শিক্ষার্থীদের প্রতি নজর দিয়েছেন	১	২	৩	৪	৫

## ANNEX – C

**Quality of Mathematics Teaching and Learning  
in the Primary Schools of Bangladesh**

শিক্ষার্থীদের জন্য সাক্ষাৎকার পত্র

শিক্ষা প্রতিষ্ঠানের নাম:-----উপজেলা:----- জেলা:-----

শিক্ষা প্রতিষ্ঠানের ধরন :- গ্রাম / শহর.

শিক্ষার্থীর নাম: -----ছাত্র:-----ছাত্রী:-----

শ্রেণি :-----শাখা:----- রোল:-----

১। শিক্ষক পাঠদানের পূর্বে তোমাদের সাথে কুশল বিনিময় করেন কি?

১.কখনো করেন না	২.মাঝে মাঝে করেন	৩.সব সময় করেন
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২। শিক্ষক বাড়ির কাজ দেন কি?

১.কখনই দেন না	২.মাঝে মাঝে দেন	৩.সব সময় দেন
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৩। বাড়ির কাজের ভুলত্রুটি চেক করে দেন কি?

১.কখনো চেক করেন না	২.মাঝে মাঝে চেক করেন	৩.সব সময় চেক করেন
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৪। শিক্ষক পাঠদান কালে কোন উপকরণ ব্যবহার করেন কি?

১.কখনই করেন না	২.মাঝে মাঝে করেন	৩.সব সময় করেন
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৫। শিক্ষক সাধারণত কি ধরনের উপকরণ ব্যহার করেন? -----

৬। কেউ অংক না বুঝলে শিক্ষক তার কাছে গিয়ে বুঝিয়ে দেন কি?

১.কখনই না	২.মাঝে মাঝে	৩.সব সময়
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৭। কোন কিছু না বুঝতে পারলে শিক্ষককে প্রশ্ন কর কি?

১.কখনই করি না	২.মাঝে মাঝে করি	৩.সব সময় করি
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৮। কোন প্রশ্ন করলে শিক্ষক মনোযোগ দিয়ে শোনে কি?

১.কখনই শোনে না	২.মাঝে মাঝে শোনে	৩.সব সময় শোনে
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৯। শিক্ষক তোমাদেরকে প্রশ্ন করতে উৎসাহিত করেন কি?

১.কখনই করেন না	২.মাঝে মাঝে করেন	৩.সব সময় করেন
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১০। শিক্ষক দলগত কোন কাজ ক্লাশে করতে দেন কি?

১.কখনই দেন না	২.মাঝেমাঝে দেন	৩.সব সময় দেন
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১১। পাঠদান শেষে শিক্ষক মূল্যায়ন করেন কি ?

১.কখনই করেন না	২.মাঝে মাঝে করেন	৩.সব সময় করেন
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১২। বাসায় গিয়ে অংক করার জন্য কারও সাহায্যের প্রয়োজন হয় কি?

১.কখনই প্রয়োজন হয় না	২.মাঝে মাঝে প্রয়োজন হয়	৩.সব সময় প্রয়োজন হয়
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১৩। বাসায় গিয়ে অংক করার জন্য অন্য কারও সাহায্যের প্রয়োজন হয় কেন ?

ক্লাশে অংক না বুঝার জন্য	ক্লাশে বুঝার পর বাসায় গিয়ে মনে না থাকার জন্য	আরও বেশি করে বুঝার জন্য
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১৪। সকল শিক্ষার্থী শিক্ষকের কথা মনোযোগ দিয়ে শোনে কি?

১.কখনই শোনে না	২.মাঝে মাঝে শোনে	৩.সব সময় শোনে
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১৫। শিক্ষক অংক করার ক্ষেত্রে কোন প্রক্রিয়া অবলম্বন করেন ?

১.কোন শিক্ষার্থীকে বোর্ডে করতে বলেন	২.শুধু মৌখিক ভাবে ব্যাখ্যা করেন	৩.নিজে বোর্ডে করে দেন
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১৬। শিক্ষক নির্ধারিত সময়ের মধ্যে পাঠ শেষ করেন কি?

১.কখনই করেন না	২.মাঝে মাঝে করেন	৩.সব সময় করেন
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## ANNEX – D

**Quality of Mathematics Teaching and Learning  
in the Primary Schools of Bangladesh**

প্রধান শিক্ষকের জন্য সাক্ষাৎকার পত্র

- ১। শিক্ষা প্রতিষ্ঠানের নাম: .....
- ২। শিক্ষা প্রতিষ্ঠানের ধরন: ১. গ্রাম ..... ২. শহর:-----৩. উপজেলা .....৪. জিলা . .....
- ৩। অনুমোদিত শিক্ষকের সংখ্যা:-----.
- ৪। কর্মরত শিক্ষকের সংখ্যা : ----- পুরুষ:-----মহিলা: -----প্রশিক্ষন প্রাপ্ত:-----প্রশিক্ষনবিহীন: -----
- ৫। মোট শিক্ষার্থীর সংখ্যা : ----- ছাত্র :----- ছাত্রী :-----
- ৬। শিক্ষক - শিক্ষার্থীর অনুপাত :
- ৭। সাধারণত কোন বিষয়ে সবচেয়ে বেশি শিক্ষার্থী ফেল করে ? ১. গণিত-----২. ইংরেজি-----৩. অন্যান্য -----
- ৮। ২০১৩ সালে ৩য় শ্রেণিতে :
- ১। অধ্যয়নরত শিক্ষার্থীর সংখ্যা----- ২। বার্ষিক পরীক্ষায় অংশগ্রহনকারী শিক্ষার্থীর সংখ্যা:-----
- ৩। সকল বিষয়ে কৃতকার্য সংখ্যা:----- ৪. গণিতে অকৃতকার্য সংখ্যা:-----
- ৯। ২০১৩ সালে ৪র্থ শ্রেণিতে :
- ১। অধ্যয়নরত শিক্ষার্থীর সংখ্যা----- ২। বার্ষিক পরীক্ষায় অংশগ্রহনকারী শিক্ষার্থীর সংখ্যা:-----
- ৩। সকল বিষয়ে কৃতকার্য সংখ্যা:----- ৪. গণিতে অকৃতকার্য সংখ্যা:-----
- ১০। ২০১৩ সালে ৫ম শ্রেণিতে :
- ১। অধ্যয়নরত শিক্ষার্থীর সংখ্যা-----২। সমাপনী পরীক্ষায় অংশগ্রহনকারী শিক্ষার্থীর সংখ্যা--
- ৩। সকল বিষয়ে কৃতকার্য সংখ্যা:----- ৪. গণিতে অকৃতকার্য সংখ্যা:-----
- ১১। পর্যবেক্ষনের জন্য সহকারী থানা শিক্ষা অফিসার মাসে কত বার বিদ্যালয় পরিদর্শন করেন?-----
- ১২। আপনার বিদ্যালয়ের নিম্নলিখিত সুবিধা সমূহের কোন কোনটি বিদ্যমান : V চিহ্ন দিন)
- ক) হোয়াইট বোর্ড    খ) মাল্টিমিডিয়া    গ) ইন্টারনেট সংযোগ    ঘ) উপকরণ কক্ষ
- ঙ) বিদ্যালয়ের পাঠাগারে গণিত বিষয়ের উপর বিভিন্ন ধরনের পর্যাণ্ড বই।
- ১৩। গণিত বিষয়ে শিক্ষন-শিখনের গুনগতমান নিশ্চিত করার জন্য প্রতিষ্ঠান প্রধান হিসেবে আপনি কি ধরনের পদক্ষেপ নিয়ে থাকেন?

## ANNEX – E

## Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh

### Tables from the questionnaire of Math Teachers

Table-1  
**Math teacher's gender**

	Frequency	Percent	Valid Percent	Cumulative Percent
male	6	18.8	18.8	18.8
female	26	81.3	81.3	100.0
Total	32	100.0	100.0	

Table-2  
**Math Teachers Highest Education**

	Frequency	Percent	Valid Percent	Cumulative Percent
higher secondary	5	15.6	15.6	15.6
bachelor degree	18	56.3	56.3	71.9
master degree	9	28.1	28.1	100.0
Total	32	100.0	100.0	

Table-3

**Math Teachers Professional Training**

	Frequency	Percent	Valid Percent	Cumulative Percent
C in ED	26	81.3	81.3	81.3
DPED	3	9.4	9.4	90.6
BED or higher	3	9.4	9.4	100.0
Total	32	100.0	100.0	

Table-4

**Math Teachers Training in Mathematics**

	Frequency	Percent	Valid Percent	Cumulative Percent
no training	14	43.8	43.8	43.8
5 or 6 days	17	53.1	53.1	96.9
more than 6 days	1	3.1	3.1	100.0
Total	32	100.0	100.0	

Table-5

**Math Teachers Age**

	Frequency	Percent	Valid Percent	Cumulative Percent
up to 30 years	9	28.1	28.1	28.1
31 to 40 years	15	46.9	46.9	75.0
41 to 50 years	8	25.0	25.0	100.0
Total	32	100.0	100.0	

Table-6

**Teaching experience as primary teacher**

	Frequency	Percent	Valid Percent	Cumulative Percent
up to 10 years	22	68.8	68.8	68.8
11 to 20 years	3	9.4	9.4	78.1
21 to 30 years	7	21.9	21.9	100.0
Total	32	100.0	100.0	

Table-7

**Math Teachers Total no. of class daily**

	Frequency	Percent	Valid Percent	Cumulative Percent
up to 5 total class	6	18.8	18.8	18.8
from 6 to 8 total class	24	75.0	75.0	93.8
more than 8 total class	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-8

**Math Teachers Total no. of other class**

	Frequency	Percent	Valid Percent	Cumulative Percent
upto 4 other class except math	13	40.6	40.6	40.6
from 5 to 8 other class except math	19	59.4	59.4	100.0
Total	32	100.0	100.0	



Table-9

**Satisfaction as math teacher**

	Frequency	Percent	Valid Percent	Cumulative Percent
slightly satisfied	12	37.5	37.5	37.5
satisfied	16	50.0	50.0	87.5
more satisfied	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-10

**Expected no of class daily for quality teaching**

	Frequency	Percent	Valid Percent	Cumulative Percent
up to 4 class	25	78.1	78.1	78.1
max 5 or 6 class	2	6.3	6.3	84.4
no comment	5	15.6	15.6	100.0
Total	32	100.0	100.0	

Table-11

**Expected duration of time of math class**

	Frequency	Percent	Valid Percent	Cumulative Percent
present time	21	65.6	65.6	65.6
50 minutes or more	11	34.4	34.4	100.0
Total	32	100.0	100.0	

Table-12

**Present math book is suitable for quality teaching**

	Frequency	Percent	Valid Percent	Cumulative Percent
suitable	9	28.1	28.1	28.1
more suitable	23	71.9	71.9	100.0
Total	32	100.0	100.0	

Table-13

**Teachers use teachers instruction**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	31	96.9	96.9	96.9
no	1	3.1	3.1	100.0
Total	32	100.0	100.0	

Table-14

**Teachers use corporal punishment**

	Frequency	Percent	Valid Percent	Cumulative Percent
no	32	100.0	100.0	100.0

Table-15

**Corporal punishment is helpful for quality math teaching**

	Frequency	Percent	Valid Percent	Cumulative Percent
no	27	84.4	84.4	84.4
no comment	5	15.6	15.6	100.0
Total	32	100.0	100.0	

Table-16

**Teacher teach lecture method only**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	13	40.6	40.6	40.6
sometimes	15	46.9	46.9	87.5
always	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-17

**Teacher give chance for group work**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	3.1	3.1	3.1
sometimes	10	31.3	31.3	34.4
always	21	65.6	65.6	100.0
Total	32	100.0	100.0	

Table-18

**Teacher teach by question answer process**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	8	25.0	25.0	25.0
always	24	75.0	75.0	100.0
Total	32	100.0	100.0	

Table-19

**Teacher give thanks for correct answer**

	Frequency	Percent	Valid Percent	Cumulative Percent
always	32	100.0	100.0	100.0

Table-20

**Evaluate student to check understanding**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	3	9.4	9.4	9.4
always	29	90.6	90.6	100.0
Total	32	100.0	100.0	

Table-21

**Show equal attitude for all**

	Frequency	Percent	Valid Percent	Cumulative Percent
always	32	100.0	100.0	100.0

Table-22

**Teacher help personally to slow learner**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	3	9.4	9.4	9.4
always	29	90.6	90.6	100.0
Total	32	100.0	100.0	

Table-23

**Teacher use chalk board**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	5	15.6	15.6	15.6
always	27	84.4	84.4	100.0
Total	32	100.0	100.0	

Table-24

**Teacher use chart**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	16	50.0	50.0	50.0
always	16	50.0	50.0	100.0
Total	32	100.0	100.0	

Table-25

**Teacher use model**

	Frequency	Percent	Valid Percent	Cumulative Percent
very short time	4	12.5	12.5	12.5
sometimes	27	84.4	84.4	96.9
always	1	3.1	3.1	100.0
Total	32	100.0	100.0	

Table-26

**Teacher use geometry box**

	Frequency	Percent	Valid Percent	Cumulative Percent
very short time	1	3.1	3.1	3.1
sometimes	23	71.9	71.9	75.0
always	8	25.0	25.0	100.0
Total	32	100.0	100.0	

Table-27

**Teacher use real thing**

	Frequency	Percent	Valid Percent	Cumulative Percent
very short time	5	15.6	15.6	15.6
sometimes	23	71.9	71.9	87.5
always	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-28  
**Teacher use multimedia**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	28	87.5	87.5	87.5
very short time	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-29  
**Teachers from location of the school**

	Frequency	Percent	Valid Percent	Cumulative Percent
village	20	62.5	62.5	62.5
upzilla town	8	25.0	25.0	87.5
district town	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-30  
**Total no. of only math class**

	Frequency	Percent	Valid Percent	Cumulative Percent
1 or 2 math class	26	81.3	81.3	81.3
3 or 4 math class	6	18.8	18.8	100.0
Total	32	100.0	100.0	

## ANNEX – F

## Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh

### Tables from classroom observation schedule

Table-31

#### Location of the school

	Frequency	Percent	Valid Percent	Cumulative Percent
village	20	62.5	62.5	62.5
upzilla town	8	25.0	25.0	87.5
district town	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-32

#### Name of the observed class

	Frequency	Percent	Valid Percent	Cumulative Percent
class three	16	50.0	50.0	50.0
class four	13	40.6	40.6	90.6
class five	3	9.4	9.4	100.0
Total	32	100.0	100.0	

Table-33

#### Teacher interchange greetings

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	25	78.1	78.1	78.1
no	7	21.9	21.9	100.0
Total	32	100.0	100.0	

Table-34  
**Teacher check previous lesson**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	12	37.5	37.5	37.5
no	20	62.5	62.5	100.0
Total	32	100.0	100.0	

Table-35  
**Teacher encourage students to ask question**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	11	34.4	34.4	34.4
no	21	65.6	65.6	100.0
Total	32	100.0	100.0	

Table-36  
**Teacher appreciate after correct answer**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	30	93.8	93.8	93.8
no	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-37  
**Teacher give homework by using chalk board**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	23	71.9	71.9	71.9
no	9	28.1	28.1	100.0
Total	32	100.0	100.0	



Table-38

**Teacher summarized lesson at the end**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	8	25.0	25.0	25.0
no	24	75.0	75.0	100.0
Total	32	100.0	100.0	

Table-39

**Teacher evaluated student to check understanding**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	19	59.4	59.4	59.4
no	13	40.6	40.6	100.0
Total	32	100.0	100.0	

Table-40

**Teacher finish the lesson within proper time**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	28	87.5	87.5	87.5
no	4	12.5	12.5	100.0
Total	32	100.0	100.0	

Table-41

**Teacher used lesson plan**

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	2	6.3	6.3	6.3
no	30	93.8	93.8	100.0
Total	32	100.0	100.0	

Table-42  
Teaching process was attractive

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	11	34.4	34.4	34.4
no	21	65.6	65.6	100.0
Total	32	100.0	100.0	

Table-43  
Student listen teachers lecture

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	9	28.1	28.1	28.1
maximum times	23	71.9	71.9	100.0
Total	32	100.0	100.0	

Table-44  
Student talking each other

	Frequency	Percent	Valid Percent	Cumulative Percent
never	8	25.0	25.0	25.0
very short time	15	46.9	46.9	71.9
sometimes	6	18.8	18.8	90.6
maximum times	3	9.4	9.4	100.0
Total	32	100.0	100.0	

Table-45  
Student ask teacher

	Frequency	Percent	Valid Percent	Cumulative Percent
never	13	40.6	40.6	40.6
very short time	12	37.5	37.5	78.1
sometimes	5	15.6	15.6	93.8
maximum times	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-46

**Teacher give answer to all question**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	3	9.4	9.4	9.4
very short time	4	12.5	12.5	21.9
sometimes	3	9.4	9.4	31.3
maximum times	7	21.9	21.9	53.1
full time	2	6.3	6.3	59.4
need not to answer	13	40.6	40.6	100.0
Total	32	100.0	100.0	

Table-47

**Student understand the instruction of teacher**

	Frequency	Percent	Valid Percent	Cumulative Percent
very short time	5	15.6	15.6	15.6
some times	16	50.0	50.0	65.6
maximum times	10	31.3	31.3	96.9
full time	1	3.1	3.1	100.0
Total	32	100.0	100.0	

Table-48

**Teacher gave lecture continuously**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	3.1	3.1	3.1
very short time	11	34.4	34.4	37.5
sometimes	14	43.8	43.8	81.3
maximum times	6	18.8	18.8	100.0
Total	32	100.0	100.0	

Table-49  
**Teacher discuss with question answer**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	3.1	3.1	3.1
very short time	12	37.5	37.5	40.6
sometimes	15	46.9	46.9	87.5
maximum times	3	9.4	9.4	96.9
full time	1	3.1	3.1	100.0
Total	32	100.0	100.0	

Table-50  
**Teacher works with chalk board**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	3.1	3.1	3.1
very short time	9	28.1	28.1	31.3
some times	14	43.8	43.8	75.0
maximum times	6	18.8	18.8	93.8
full time	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-51  
**Teacher used teaching aids**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	17	53.1	53.1	53.1
very short time	8	25.0	25.0	78.1
some times	6	18.8	18.8	96.9
maximum times	1	3.1	3.1	100.0
Total	32	100.0	100.0	

Table-52  
**Teacher has given group works**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	25	78.1	78.1	78.1
very short time	5	15.6	15.6	93.8
sometimes	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-53  
**Student works in a group**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	23	71.9	71.9	71.9
very short time	5	15.6	15.6	87.5
some times	2	6.3	6.3	93.8
maximum times	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-54  
**Teacher move to observe student works**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	5	15.6	15.6	15.6
very short time	14	43.8	43.8	59.4
sometimes	8	25.0	25.0	84.4
maximum times	3	9.4	9.4	93.8
full time	2	6.3	6.3	100.0
Total	32	100.0	100.0	

Table-55  
**Teacher take care to slow learners**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	19	59.4	59.4	59.4
very short time	5	15.6	15.6	75.0
sometimes	4	12.5	12.5	87.5
maximum times	3	9.4	9.4	96.9
full time	1	3.1	3.1	100.0
Total	32	100.0	100.0	

## ANNEX – G

## Quality of Mathematics Teaching and Learning in the Primary Schools of Bangladesh

### Tables from the Structured Interview schedule of students

Table-56

#### Students gender

	Frequency	Percent	Valid Percent	Cumulative Percent
boys	25	52.1	52.1	52.1
girls	23	47.9	47.9	100.0
Total	48	100.0	100.0	

Table-57

#### Class of student

	Frequency	Percent	Valid Percent	Cumulative Percent
class three	16	33.3	33.3	33.3
class four	16	33.3	33.3	66.7
class five	16	33.3	33.3	100.0
Total	48	100.0	100.0	

Table-58

#### Range of class roll

	Frequency	Percent	Valid Percent	Cumulative Percent
roll no 1-15	28	58.3	58.3	58.3
roll no 16-30	8	16.7	16.7	75.0
above 30	12	25.0	25.0	100.0
Total	48	100.0	100.0	

Table-59  
School type

	Frequency	Percent	Valid Percent	Cumulative Percent
village	30	62.5	62.5	62.5
upzilla sador	12	25.0	25.0	87.5
district sador	6	12.5	12.5	100.0
Total	48	100.0	100.0	

Table-60  
Number of acting teacher

	Frequency	Percent	Valid Percent	Cumulative Percent
upto 5	15	31.3	31.3	31.3
from 6 to 10	24	50.0	50.0	81.3
above 10	9	18.8	18.8	100.0
Total	48	100.0	100.0	

Table-61  
Teacher exchange greetings

	Frequency	Percent	Valid Percent	Cumulative Percent
never	2	4.2	4.2	4.2
sometimes	27	56.3	56.3	60.4
always	19	39.6	39.6	100.0
Total	48	100.0	100.0	

Table-62  
Teacher give homework or not

	Frequency	Percent	Valid Percent	Cumulative Percent
never	2	4.2	4.2	4.2
sometimes	17	35.4	35.4	39.6
always	29	60.4	60.4	100.0
Total	48	100.0	100.0	



Table-63

**Teacher check homework or not**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	29	60.4	60.4	60.4
always	19	39.6	39.6	100.0
Total	48	100.0	100.0	

Table-64

**Teacher use teaching aid or not**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	11	22.9	22.9	22.9
sometimes	35	72.9	72.9	95.8
always	2	4.2	4.2	100.0
Total	48	100.0	100.0	

Table-65

**What type of teaching aid uses**

	Frequency	Percent	Valid Percent	Cumulative Percent
pen	4	8.3	8.3	8.3
chart	5	10.4	10.4	18.8
geometry box	1	2.1	2.1	20.8
stick	2	4.2	4.2	25.0
nothing	27	56.3	56.3	81.3
pen and chart	1	2.1	2.1	83.3
pen , picture	1	2.1	2.1	85.4
picture ,chart,model	4	8.3	8.3	93.8
scale and paper	3	6.3	6.3	100.0
Total	48	100.0	100.0	

Table-66

**Teacher give extra care or not who does not understand**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	2	4.2	4.2	4.2
sometimes	34	70.8	70.8	75.0
always	12	25.0	25.0	100.0
Total	48	100.0	100.0	

Table-67

**Student asked anything teacher or not**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	5	10.4	10.4	10.4
sometimes	30	62.5	62.5	72.9
always	13	27.1	27.1	100.0
Total	48	100.0	100.0	

Table-68

**Teacher listen student question or not**

	Frequency	Percent	Valid Percent	Cumulative Percent
sometimes	20	41.7	41.7	41.7
always	28	58.3	58.3	100.0
Total	48	100.0	100.0	

Table-69

**Teacher evaluate or not at the end of the class**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	3	6.3	6.3	6.3
sometimes	30	62.5	62.5	68.8
always	15	31.3	31.3	100.0
Total	48	100.0	100.0	

Table-70

**Why students need other help?**

	Frequency	Percent	Valid Percent	Cumulative Percent
can not understand in class	5	10.4	10.4	10.4
i forgive when i go to house	11	22.9	22.9	33.3
understand more	21	43.8	43.8	77.1
both 1 and 2	4	8.3	8.3	85.4
both 2 and 3	7	14.6	14.6	100.0
Total	48	100.0	100.0	

Table-71

**All student follow or not the lesson**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	2	4.2	4.2	4.2
sometimes	32	66.7	66.7	70.8
always	14	29.2	29.2	100.0
Total	48	100.0	100.0	

Table-72

**What method followed by the teacher?**

	Frequency	Percent	Valid Percent	Cumulative Percent
teacher solves in the board	9	18.8	18.8	18.8
both 1 and 3	6	12.5	12.5	31.3
both 2 and 3	28	58.3	58.3	89.6
all of 1 ,2 and 3	5	10.4	10.4	100.0
Total	48	100.0	100.0	

Table-73

**Teacher finish lesson within time**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	2.1	2.1	2.1
sometimes	23	47.9	47.9	50.0
always	24	50.0	50.0	100.0
Total	48	100.0	100.0	

Table-74

**Teacher give confidence to ask question or not**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	5	10.4	10.4	10.4
sometimes	34	70.8	70.8	81.3
always	9	18.8	18.8	100.0
Total	48	100.0	100.0	

Table-75

**Teacher give group work in class or not**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	35	72.9	72.9	72.9
sometimes	13	27.1	27.1	100.0
Total	48	100.0	100.0	

Table-76

**Student need or not other help in house**

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	2.1	2.1	2.1
sometimes	9	18.8	18.8	20.8
always	38	79.2	79.2	100.0
Total	48	100.0	100.0	

## ANNEX – H

**Quality of Mathematics Teaching and Learning  
in the Primary Schools of Bangladesh**

**Tables from the Interview Schedule of Head Teachers**

Table-77

**Location of the school**

	Frequency	Percent	Valid Percent	Cumulative Percent
village	10	62.5	62.5	62.5
upzilla town	4	25.0	25.0	87.5
district town	2	12.5	12.5	100.0
Total	16	100.0	100.0	

Table-78

**Sanction teacher and present teacher**

	N	Minimum	Maximum	Sum	% of acting teacher
number of sanction teacher	16	4	14	127	-----
number of acting teacher	16	4	13	119	93.7%
Valid N (list wise)	16				

Table-79

**Present teacher, male teacher, female teacher,  
trained teacher and non -trained teacher**

	N	Minimum	Maximum	Sum	%
Number of acting teacher	16	4	13	119	-----
Number of male teachers	16	0	6	35	29.4%
Number of female teacher	16	2	13	84	70.6%
Trained teacher	16	3	12	113	95%
Non trained teacher	16	0	1	6	5%
Valid N (list wise)	16				

Table-80

**Total student and teacher-student ratio**

	N	Minimum	Maximum	Sum	Average no. of student against per teacher
Number of student	16	170	827	6265	-----
Number of acting teacher	16	4	13	119	-----
Number of student per teacher	16	34	71	-----	52.6
Valid N (list wise)	16				

Table-81

**Statistics of class three student at 2013**

	N	Minimum	Maximum	Sum	%
Total student of class three at 2013	16	25	177	1156	-----
Participated student of annual exam 2013	16	23	156	1067	92.3%
All subject pass student of annual exam 2013	16	21	142	840	78.7%
Fail in math at annual exam at 2013	16	0	41	202	18.9%
Valid N (list wise)	16				

Table-82

**Statistics of class four student at 2013**

	N	Minimum	Maximum	Sum	%
total student of class four at 2013	16	28	160	1057	-----
participated student of annual exam 2013	16	28	150	989	93.6%
all subject pass student of annual exam 2013	16	26	132	788	79.7%
fail in math at annual exam at 2013	16	0	38	160	16.2%
Valid N (list wise)	16				

Table-83

**Statistics of class five student at 2013**

	N	Minimum	Maximum	Sum	%
total student of class five at 2013	16	14	147	860	-----
participated student of annual exam2013	16	14	145	834	97%
all subject pass student of annual exam 2013	16	14	143	825	98.9%
fail in math at annual exam at 2013	16	0	3	7	o.84%
Valid N (list wise)	16				

Table-84

**Perception about maximum fail in which subject**

	Frequency	Percent	Valid Percent	Cumulative Percent
fail in mathematics	5	31.3	31.3	31.3
fail in English	5	31.3	31.3	62.5
fail equally both in math and English	6	37.5	37.5	100.0
Total	16	100.0	100.0	

Table-85

**How many times visit ATEO in per month?**

	Frequency	Percent	Valid Percent	Cumulative Percent
1 times in a month	9	56.3	56.3	56.3
more than 1 times in a month	3	18.8	18.8	75.0
less than 1 times in a month	4	25.0	25.0	100.0
Total	16	100.0	100.0	



Table-86  
Some facility has or not

	Frequency	Percent	Valid Percent	Cumulative Percent
teaching aids room	3	18.8	18.8	18.8
different math books in library	2	12.5	12.5	31.3
nothing has out of white board, multi-media, internet, teaching aid room, different math books	10	62.5	62.5	93.8
both multi-media and internet	1	6.3	6.3	100.0
Total	16	100.0	100.0	

Table-87  
Correlations

		number of student against per teacher	fail in math at annual exam of class three at 2013	fail in math at annual exam of class four at 2013
number of student against per teacher	Pearson Correlation	1	.429 <sup>*</sup>	.423
	Sig. (1-tailed)		.049	.051
	N	16	16	16
fail in math at annual exam of class three at 2013	Pearson Correlation	.429 <sup>*</sup>	1	.921 <sup>**</sup>
	Sig. (1-tailed)	.049		.000
	N	16	16	16
fail in math at annual exam of class four at 2013	Pearson Correlation	.423	.921 <sup>**</sup>	1
	Sig. (1-tailed)	.051	.000	
	N	16	16	16

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\* . Correlation is significant at the 0.01 level (1-tailed).

Table-88  
Correlations

		fail in math at annual exam of class three at 2013	fail in math at annual exam of class four at 2013
fail in math at annual exam of class three at 2013	Pearson Correlation	1	.921**
	Sig. (1-tailed)		.000
	N	16	16
fail in math at annual exam of class four at 2013	Pearson Correlation	.921**	1
	Sig. (1-tailed)	.000	
	N	16	16

\*\* . Correlation is significant at the 0.01 level (1-tailed).