

**FACTORS AFFECTING MATHEMATICS ACHIEVEMENT OF  
STUDENT AT SECONDARY LEVEL**

**A  
THESIS  
BY**

**BHOLA NATH LAMICHHAE**

**IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF EDUCATION**

**SUBMITTED TO  
DEPARTMENT OF MATHEMATICS EDUCATION  
CENTRAL DEPARTMENT OF EDUCATION  
UNIVERSITY CAMPUS, KIRTIPUR  
TRIBHUVAN UNIVERSITY  
KATHEMANDU, NEPAL**

**2015**

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## LETTER OF APPROVAL

A

**Thesis**

**By**

**BHOLA NATH LAMICHHANE**

**Entitled**

**Factor Affecting Mathematics Achievement of Students' at Secondary Level**  
has been approved in partial Fulfillment of the Requirements for the Degree of Master of

Education.

**Committee for Viva-Voce**

**Signature**

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Date: 2071-11-25

## LETTER OF CERTIFICATE

This is to certify that **Mr. Bhola Nath Lamichhane**, with campus Roll No. 462/063 T.U., Exam Roll No. 281692 and T.U. Registration No. 9-2-48-3089-2002 has completed this thesis under my supervision for the period prescribed by the rules and regulations of Tribhuvan University Nepal. The thesis entitled “**Factor Affecting Mathematics Achievement of Student’ at Secondary Level**” embodies the result of his investigation conducted during the period of 2070-2071 B.S. This thesis is submitted and forwarded for evaluation and recommended to award the degree of Master of Education.

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(Mr. Krishna Prasad Adhikari)

Supervisor

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(Mr. Laxmi Narayan Yadav)

Head

Date: March, 2015

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Bhola Nath Lamichhane

## ABSTRACT

This study focuses on the “Factors Affecting Mathematics Achievement of Students’ at Secondary Level.” This is a survey type study that attempts to describe the achievement of Mathematics and to analyze the factors that affects the achievement of students. Six public schools were selected randomly from all public schools of Parbat district. One set of achievement test was administrated to find out the achievement level of students of selected grade of selected school. And one set of opinionnaire scale was prepared and distributed to the students to find out the effect of teaching learning process, home environment, social variable, time variable, school environment and error in problem solving in students’ achievement. Unstructured interviews were taken with the mathematics teacher from respective sample school concerning towards these factors. Related literature, mathematical tools which are related to this study have been used to interpret and made reflection over the analyzed information. Student’s t- Value and  $\chi^2$ -value were used to interpret the result.

This study shows that the achievement of mathematics is very low in. The main factors that affects in achievement in mathematics are parents economic condition, parents’ education, prior knowledge, different error made by students in solving mathematical problems, peer groups, school environment, teaching learning process, drill and practice.

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## **LIST OF ABBREVIATIONS**

BPEP	:	Basic and Primary Education Project
CERID	:	Research Centre for Educational Innovation and Development
DEO	:	District Education Office
EDSC	:	Educational Development Service Center
MAT	:	Mathematics Achievement Test
NASA	:	National Assessment of Student Achievement
SLC	:	School Living Certificate
SPEED	:	Secondary Education Development Project

## CHAPTER - I

### INTRODUCTION

#### ***Background of the Study***

Mathematics which is dynamic in nature as discipline and essential part of human life is etymologically derived from an ancient Greek word “Mathema taken from *matheanein*” means “to learn”. Mathematics is the science of numbers, quantity and space (Sidha, 1984). It is also the logical study of shape, arrangement, quantity and other many related concepts. It was developed through the human endeavors in different eras. Now it has come to the height of development and will even be in the process of development in the future.

Mathematics has been accepted as an important component of formal education from ancient period to the present day. History shows that ancient people developed mathematics practically being obliged to solve day to day problem. Latter on advanced form of the mathematics structure, rules, formulas, theories developed and used on studying social problems through empirical observation and experience about place of mathematics even in the ancient period Traverse and Others (1977) states as: “even since the school of an ancient Greeks over 200 years ago Mathematics has been a key subject in the curriculum. The four liberal arts the Arithmetic, Geometry, Astronomy and Music were basically mathematical studies.”

Today mathematics is being used in every activities of mankind; mathematics is so much significant to human life that no one can be away from its use. Mathematics has also taken a significant place in the Nepalese school. After the establishment of School Leaving Certificate Examination Board in Nepal, the Secondary School curriculum was systematized at first in the history of education. The first curriculum for secondary level has included compulsory mathematics carrying full marks 100 along with specialization mathematics of

100 marks. The vocational training started with the name of Adhareshikha in 1947 A.D had given emphasis on mathematics.

In 2008 B.S., the household account (50 marks) was added with Domestic Arithmetic. For girls, it was optional whereas it was compulsory for boys which deserved 50 marks. Boys could also choose two papers containing 200 marks.

In 2011 B.S., the Nepal National Education Planning Commission made recommendation for defining the authority of MOE, for the establishment and enforcement of standards reported that such examination system was a passed system and compulsory mathematics was even in the curriculum of multipurpose secondary school. Advanced mathematics was also included in the college preparatory area of the vocational works.

In 2018 B.S., All Round Education Committee included compulsory as well as optional mathematics in the art and science school but only compulsory mathematics in the vocational and Sanskrit schools. After then National Education System Plan, 2028 B.S. brought a view to assert and implement the national education policy and objectives, with centralized governance of education system. Moreover, it emphasized in making mathematics life oriented and practical by revising and improving mathematics curriculum and adopting an effective teaching method. After the implementation of NESP, mathematics has been taught as a compulsory subject at all level of the school education system in Nepal.

The report of Higher Level Education Commission in 2055 B.S. has proposed some suggestions for secondary education into three groups; six to eight grade as lower secondary, nine to ten as secondary and eleven to twelve grades as higher secondary.

The curriculum mathematics relates to every level in which lower level curriculum is the base for upper level. Grade nine plays vital role for SLC and it is even the base of S.L.C.

examination. In our society S.L.C. is known as the Iron Gate or gate way for further studies. In Nepal achievement of mathematics in secondary level is poor then other major subject such as English, Science, Social Study and Nepali. The comparative study of secondary level major subjects' achievement of last two years is shown in the following table.

**Table 1: National Wise achievement of SLC**

Subject	Achievement Percent	
	2069	2070
Social Study	37.05	39.49
English	40.89	40.35
Nepali	44.76	44.79
Mathematics	37.89	36.40

**Source:** *Secondary Examination Board, Sanothimi*

In the similar way, the comparative study of district level major subjects' achievement of Grade nine at Parbat district is as follows.

**Table 2: Achievement of Grade Nine student of Parbat**

Subject	Achievement Percent		
	2068	2069	2070
Social study	37.5	41.31	47.11
English	46.09	43.61	40.51
Nepali	44.35	44.16	50.00
Mathematics	32.07	37.35	33.07

**Source:** District Education Office, Parbat

The above table shows that the achievement in mathematics is less than in other major subject. In the comparative study of the achievement of mathematics it is shown as one of the biggest challenge to teachers and policy makers. This table rises two main facts that, all subjects' achievement is less than 50% means students' achievement in national level is very poor. And the second one is why it is very poor in Mathematics subject? Generally, the parents, students and others concerned people believe that such poor achievement is the consequence of carelessness of teachers and their inefficiency and lack of proper teaching technique. This blame makes every mathematics teacher feel as being guilty. But the real fact about it hasn't been found yet. At the same time, if the blame is true, the mathematics teachers need to improve their teaching strategies according to change in time. Such poor achievements have continuously been seen even after the implementation of new curriculum and evaluation system. So, this poor achievement should be studied in relation with curriculum and evaluation system. Therefore, it is very essential to make detail study of problems in curriculum, textbooks, evaluation system, teaching learning activities and the whole nation wise academic environment. All the facilities are same but mathematics score is poor. So, it is

a complex issue in educational research. But most of the studies that have done so far are the comparative studies of the achievement in different aspect of school mathematics such as gender, school types and school location. So, the researchers undertook achievement in mathematics and the “Factors Affecting in Achievement of Mathematics at Grade IX” as a problem under this study

### ***Statement of the Problem***

This research has been undertaken in order to examine factors which are associated to the students' achievement in mathematics. Today, other disciplines such as science, engineering, medicine and technology may be handicapped without mathematics and the world cannot run smoothly without the application of mathematics. It has become a gatekeeper in the life of students for their carrier choice in further study. Therefore, mathematics is the central part of the school curriculum not only in Nepal but also in entire world. Most of the students in Nepalese schools are poor in mathematics. Almost all educational surveys of school education in Nepal show the poor achievement in mathematics.

CERID (1985) reported that grade five student mathematics score was less than 45%. BPEP (1997 and 1998) found that grade four and grade five students' achievement scores in mathematics were 28% and 26% respectively. Educational Development Service Center (EDSC) in 1999 found that among the grade five students in the mathematics private and public school were 42.12% and 36.25% respectively. Siksa (2013) reported that the average achievement of grade eight students in mathematics in national levels was 43% and girls and boys scores were 41% and 45% respectively. But the average achievement of Nepali and Social Studies of grade eight are 49% and 49% respectively. It shows that most of the students in schools are poor in mathematics. So, that low achievement in mathematics is common problem at school levels, mostly in developed and under developed countries. More than half

of the total students failed in mathematics in previous result and studies. This issue is a challenge for the future of students who study in school. Thus , the study was mainly concerned with the achievement of students at grade nine in mathematics and focused in the factor that affect achievement in Mathematics. For this, the study addressed to answer the following research questions.

- What is the achievement level of student in Mathematics?
- What are the factors that affect achievement of Mathematics?

### **Significance of the Study**

The focus of the study was to analyze the present achievement level of students and to investigate the factors that influence students' achievement in mathematics. Few researchers have been focused on investigating the variables which affect the achievement of mathematics. The variables of particular interest in this study were students' personal, house related, school related, social, time variables and curricular variables resulting in the students' learning outcomes in mathematics.

This research will also provide the evidences in the students' achievement in mathematics. The research of this nature will provide helpful information to educatory and policy makers while developing policy for school head teachers and teachers. It further will provide knowledge on strategies to promote positive outcomes and productive working environments. It will even be helpful to the curriculum developers in the selecting appropriate content and skills, which educators need to redefine the understanding of the relationship between curriculum and learning.

The study has some of significance as follows:

- To select appropriate content and skills for curriculum developers,
- To develop plans and projects in the discipline of education and training for educational policy makers.
- To help in proper monitoring the teachers to teach and assess their students to educational managers and supervisor of secondary level,
- To help in designing service training courses for teachers to consider the existing achievement level of students for trains of teacher education institutions, and
- To help the door for creating new pedagogy for teaching mathematics.

### ***Objective of the Study***

The main purpose of this study is to find out the factor affecting the students' achievements in mathematics of grade IX students. In addition this study intends to accomplish the following specific objective.

- To analyze the present achievement level of grade IX students' in mathematics,
- To analyze the major factors that affect in achievement of mathematics of grade IX students.

### ***Delimitation of the Study***

This study was based on the instructional prospective. This study deals with personal factor affecting the achievement of mathematics.

The study has the following limitations:

- This study was based on only three public and three private schools of Parbat district located in rural and urban area.

- This study included only grade nine students.
- The study included fifty five students of sampled schools' in academic year 2067/2068

B.S.

- This study was limited to the compulsory mathematics of grade nine.

### ***Definition of the Related Terms***

#### **Achievement**

The achievement in this study is defined in terms of the scores obtained by the students in Mathematics Achievement Test constructed by the researcher.

#### **Factors**

The term 'factor' is defined as students' personal, social, house related, school related and error in problem solving factors in this research.

#### **Students' personal factors**

It is defined as the interest in mathematics, peer interaction in math study, prior knowledge (previous final exam scores), expenditure of time in studying mathematics and curiousness in mathematics.

#### **Social factors**

It is defined as the social system, culture and values given by society.

#### **House Related Factors**

It is defined as parents' education, economic condition and parents' occupation of the students.

#### **School Related Factors**

It is defined as physical facilities of school, teacher's qualification, number of student in a class and teachers' behaviors.

**Error in Problem Solving**

It is defined as reading, comprehension, translation, process skill and encoding error.

**Urban and Rural Area**

Urban and Rural area of Parbat district is defined in accordance to the definition given by the Ministry of Local Development of Nepal.

## CHAPTER – II

### REVIEW OF RELATED LITERATURES

The literature review helps the researcher to know the work carried out in the area of his research paper. There are different research studies concerning affecting factors of learning mathematics which are directly or indirectly related to the achievement of mathematics which are the reviews of this study. The reviews of the related literature are as follows:

CERID/SEDP (1999) A study entitled "Assessment of Learning Achievement of Lower Secondary Children (grade six and eight)" was launched. In this study, altogether twenty-two sub-factor under the students' personal characteristics, school-related variable, and family/home background were selected in order to find out the factor contributing the grade six and eight students' achievement in mathematics. Out of such factors, only seven were found to be significant. Mother's occupation, student's gender, age, language spoken at home, worked at home, absent days in the school, grade repetition and father's occupation were found as major factors. The mean, SD, regression equation and t-test were used to analyze the data collected through the students' achievements test interview and survey forms for head teacher, teacher, student and school related variables.

Joshi (1997) pursued a research on "Determinations of Mathematics Achievement of Grade X Students" for Ph.D. who included that class attendance, motivation, age, prior mathematics background, parental support, parental education, location of school and teachers' experience are the significant factors for the achievement.

Neupane (2001) studied the "Mathematics Achievement of Primary School Children of Various Ethnic Group' ( Magar, Gurung, Newor, Tharu and Kumal) in Nepal." He took the sample of 500, grade five students and their parents from twenty seven schools of five

different districts. In the study the students' achievement score were dependent variables and the children's biographical factors and parents' involvement in their mathematics study were the independent variables. The mathematics achievement test was administered at the end of the academic session.

Ghimire (1999) studied on "Study on Factors Affecting Teaching/ Learning Mathematics at Secondary Level" with the objective to study the factor, affecting in learning of schools in terms of school environment, family background, and motivational material. The tools for the study were administered to the sample of ninety students and t-test was applied to conclude the results and found that, the environment of school in both rural and urban area affects equally but the boys are more affected than girls. Home environment affected girls more than boys. The students of urban areas were more affected by the use of instructional materials and girls paid more attention to use of instruction.

Astin (1995) found that boys are more likely than girls to have informal, mathematically related experiences such as playing with scientific toys, boys also have more problems solving experience outside the mathematics classroom.

Joshi (2011) concluded a research on "Factors Affecting Mathematics Achievement in infective School in the Remote Area of Doti District" From the survey and distractively analyzed. Ten students (5 boys and 5 girls) were selected randomly. The major findings were as the physical facility of school was just satisfactory but not enough to facilitate effective and creative teaching learning activities. Though the teacher was an academically qualified still following traditional teaching methods. There was no provision of extra classes for low performer in mathematics. Teacher and parent have communication gap

Paudel (2011), studied on “Factor Affecting the Girls Achievement in Geometry” with the objective to find present achievement level of girls in Geometry and to identify the factors that affects the achievement of girls in geometry in Syangja district. She selects 50 girl students out of 269 students from six selected school. The tools for the study were observation, interview and questionnaire. She found that girl’s achievement is low, home environment, school environment, continuous the practice, review and application of geometrical concepts, social variables such as social system, cultural customs and traditional effects of gender affect achievement.

Pant (2009) conducted a research on "Students' Personal Characteristics Affecting on Achievement in Mathematics' At Lower Secondary Level (Grade Eight): A case study of Lalitpur District in Mathematics.” He found that the achievement of mathematics was 52 with standard deviation 19.32 and concluded that the achievement level of the students of Lalitpur district is higher the mean achievement of the national achievement 2009. The differences between the achievement of boys and girls, public school and private school students, rural and urban school were statistically significant, it was concluded that the performance of boys was better than the performance girls. The performance of private school students was better than the performance of public school students similarly, the performance of urban school was far better than the performance of rural school students.

EDSC/BPEP (1997) conducted a study on “National Achievement Level of Grade Three Students.” This study concentrated on four main factors i.e. student related factors, parent related factors, teacher related factors and school related factors altogether sixty sub factors. Within Four major factors were studied among the sixty factors; only five sub factors had certain role in achievement in mathematics of grade three students. These significant factors

were attendance, continuing of study without failure, school supervision, meeting and expenditure assigned per student.

EDSC report (1997, 1999, 2001) Many studies on student's achievement level in mathematics revealed the fact that achievement level of primary school students in this nation is low and unsatisfactory. The study time, school attendance, amount of home work, length of school year, peer group's interaction, exposure to mass media like T.V. strongly influence the learning outcomes of students. The correlation of students' background characteristics and achievement, the prior knowledge, family back ground may motivate the student learns. The effects of home environment, school environment, parental education and occupation are some key factors of learning mathematics.

Good (1959) in the Dictionary of Education referred to academic as achievement as "knowledge attained or skill developed in the school subjects, usually designed by test scores or marks assigned by the teacher".

Bastola, (2007) A study "A studied on the factor affecting the achievement of Dalit students in kaski District." The purpose of the study was to describe the learning environment for Dalit students in the school and find the relationship between the teacher and Dalit students in the class. To identify the major factors those affect the mathematics achievement of Dalit student. He took three students, three parents and three teachers as sample. He used observation and interview schedule as tools. He found that poverty, household work load, expensive education, motivation is the major factor that affecting the achievement of the students.

A research was conducted by Educational Development Service Center (EDSC, 1999) in "National Assessment of Grade Five students", with a view to collect baseline information

about the performance of grade five students in Nepali language, Mathematics and Social Studies. The overall mean performance of students at national level in Mathematics, Nepali and Social Studies were found to be 27.25%, 51.46% and 41.79% respectively. This research raised a major concern about the low performance in mathematics. The research on "Performance level of Grade Five Students" conducted by Research Center of Educational Innovations and Development (CERID) in 1998 revealed the need of more emphasis on teaching mathematics.

The research done by CERID in 1990 on "Assessment of Learning Achievement of Lower-Secondary Children (grade six and eight)" reported that the mean achievement scores of grade eight students in mathematics were 28.87 and grade six students were 44.44%.

National Assessment of student Achievement (NASA) conducted a research on achievement of grade nine students of Nepali, Social Studies and Mathematics in 2011. And found that achievement of Nepali, Social and Mathematics' were 49%, 49% and 43%.

Bohara (2012), studied on "Factor Affecting Failure in Mathematics at SLC Examination" with the objective to identify major factors affecting to failure students in SLC and to measure the correlation between affecting factor for the mathematics achievement with the sample of 100 failure student's in SLC examination 2065. The tools for the study were observation, interview and questionnaire. He found that home environment, physical facility, teachers behavior and motivation in class room, home environment, interest of learner, social factor and practice of leaner affect achievement in mathematics.

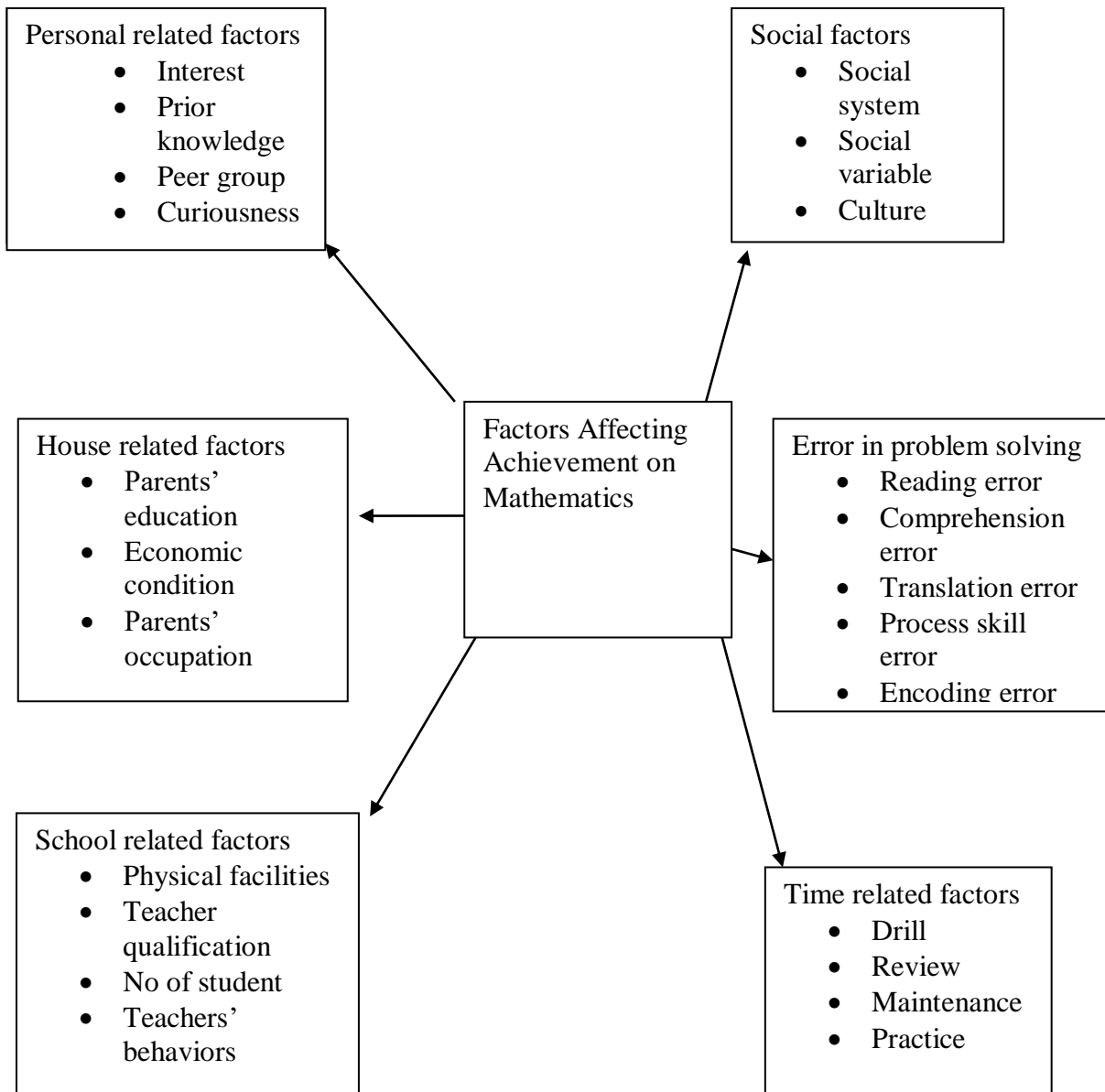
The above studies have been done so far are the comparative studies of the factor affecting achievement in different aspect of school mathematics such as gender, school types, school's location and different ethnic group. There is the research gap in this area; so, to

fulfill this gap, the researcher motivated to select this area. The present study deals with achievement of student at secondary level.

### ***Conceptual Framework of the Study***

As discussed above related literature achievement on mathematics may depend under different variables. Generally achievement in mathematics is influenced by school environment, home environment, social system, personal behavior, time variable and error in problem solving. Under school related environment physical facilities, teachers' qualification, number of students in a class and teacher behaviors were discussed. The variable home environment consist parent's education, economic condition and parent's occupation. Personal behavior is important factor for achievement in mathematics which includes interests, prior knowledge, peer group and curiousness of student towards mathematics. Social factor is also inevitable factor in mathematics achievement. This includes social system, social variable and cultural customs. Along with error in problem solving reading error, comprehension error, translation error, process skill error, encoding error are even factors. Time variable also plays vital role in achievement in mathematics, in which drill, review, maintenance and practice are included. The above described variables together with constitute the achievement in mathematics. The researcher had developed the following frame work with the help of those variables.

**Figure 1**



**Conceptual Framework of the Study**

*Source Paudel (2011)*

The main theoretical basis of this study was developed from the models of Joshi (1997), Neupane (2001) and Paudel (2011). The proposed model of mathematics

achievement of grade nine students for the students' achievement in mathematics, a conceptual framework of students' achievement was established in this research work.

## CHAPTER – III

### RESEARCH METHODS AND PROCEDURES

This chapter deals with the theoretical discussion. It was needed for the interaction of the findings of the study. The design of the study was mixed in nature and aimed to find out the factor affecting mathematics achievement of student at secondary level.

Thus, this study was a quantitative and qualitative in nature including some description of the phenomenon. The research was survey design supported by descriptive approach. This chapter presents the details of the procedure used in this study in the following sections.

#### ***Design of the Study***

This study was based on a mixed research design quantitative and qualitative in nature. Mathematical achievement test, opinionnaire and interview were applied to collect the data. The main research design was survey. To explain the term survey design it was a form planned collection of data for the purpose of analyzing the relationship between of certain variables which were mainly related to the mathematical achievement of the government and private schools' students' of Parbat district. Quantitative data was descriptively analyzed on the basis of teachers' interviews form. Thus, this present study was more quantitative in nature.

The study was designed to examine the existing status of grade IX students' achievement in mathematics and determinates of students' achievement in mathematics. Primary data was collected from the respondents through the MAT, opinionnaire forms and interview.

## **Population of the Study**

Population of the universe of the research comprises the entire mass of the students that was observed. The sample observation provides only an estimation of population characteristic (Sharma, 2001). "A population is defined as a group of individuals with at least one common characteristic which distinguishes that group from other individual" (Best & Kahn, 2006). It means the group of people living in a certain territory.

The population of the study was consisted of all regular students in academic year 2067/2068 BS of secondary level government schools at grade IX in Parbat district.

## ***Sample of the Study***

The sample of the study was determined by using stratified random sampling method for selecting government and private secondary school of Parbat district. The sample of the study was consisted all grade IX students who completed the grade VIII level of mathematics course from government aided three public secondary school and three private secondary school with 27 boys and 28 girl students of Parbat district during the academic year 067/068 BS. The samples were taken from these schools. In the sampling process stratification of Secondary school of Parbat in to strata as public and private out of 85 Secondary school in Parbat ( report, 2067, EDO) the researcher randomly selected three public and three private Secondary School. The following table gives the clear picture of this study.

**Table 3: List of Sample school**

S.N	School	School Type	Male students	Female students	Total number of students
1	Poorneshwar Higher Secondary School	Public	5	4	9
2	Namuna Aabashaya Mavi	Private	5	5	10
3	Bhabani Viddha Pith Higher Secondary School	Public	4	5	9
4	Janak Secondary School	Public	4	5	9
5	Eyebeal Boarding Secondary School	Private	4	5	9
6	Gurukul Aabashaya Mavi	Private	5	4	9

### **Tools of the Study**

Data collection tools are very important for collecting information require for any type of research. The selection of data collection tools is mainly guided by the nature of the study. The data collection tools of the research study were mathematics achievement test, opinionnaire and interview schedule (semi- structured interview scheduled).

The researcher used the following tools for the data collection.

- Mathematics Achievement Test (MAT)
- Opinionnaire Scale
- Interview

- **Developing the Mathematics Achievement Test (MAT)**

Since the purpose of the study was to study the achievement level of grade nine students in the mathematics, a standardized mathematics achievement test was required to measure the achievement level of the student in the subject. An Achievement test was main research tool for this study. Achievement test measures as the crucial factor to explore the students' achievement. The researcher had framed test item for the achievement-test with the help of curriculum, specification grid, text book and concluding with the supervisor. The achievement test was consisted knowledge, skill, and comprehension and application level items. The items were kept in the form of multiple choices. Before preparing the standardized test, the pilot test is necessary. So the pilot test was conducted at Adarsha secondary school of Myagdi district. A set of questionnaire for MAT is kept in Appendix- A.

- **Opinionnaire Scale**

Information that attempts to measure the attitude or belief of an individual is known as an opinionnaire or attitude scale. So, one set opinionnaire was developed as an instrument for the collection of required information which was used for students. Prior to construct this tool for the study, the following factors that affect the achievement on mathematics were identified from the review of literature with the help of experts and advisors. Teaching learning process, home environment, school environment, parents' education, time variables, personal factor, and social variables were the factors that included in this study. It is assumed that these variables as already established could influence the achievement in mathematics in Secondary Education in Parbat district.

One set of opinionnaire scale were developed having thirty four statement related to the above variable (see Appendix-B) for the students who are studying at grade nine in Parbat district. These scales were developed in Likert Scale Point Techniques. Both positive and

negative statements were included in the scale in the scale. Scoring of the statements was done as shown in the following table.

**Table 4: Likert Scale Scoring**

S.N.	Meaning of rating	Positive Statement	Negative Statement
1	Strongly Agree	5	1
2	Agree	4	2
3	Undecided	3	3
4	Disagree	2	4
5	Strongly Disagree	1	5

- **Interview Schedule**

Interview is a process of communication of interaction in which subject or interviewee gives the needed information verbally in a face to face situation (Koul, 1997). Interviewee is encouraged to respond towards the question after building a better rapport. In this research interview was conducted with clients in this study. In this technique, the researcher not only asked the questions but also observed all behavior and answering method of respondents. In this study, on the basis of objectives the researcher developed the interview guideline in a semi-structured form (Appendix-C) to collect the information from mathematics teacher.

***Reliability and Validity of Tools***

Validity refers to whether the questionnaire or survey measures what it intends to measure (Creswell, 2003). The overriding principle of validity is that it focuses on how a questionnaire or assessment process is used. There are very detailed and technical ways of

providing validity of the questionnaire. Reliability is a characteristic of the instrument itself. Reliability is synonymous with the consistency of a test, survey, observation, or other measuring devices. The researcher used the tools to collect data: Mathematics achievement test, Students' questionnaire form and teacher Interview. For the purpose of reliability of achievement test pilot test was used at Aadarsha Scondary School at Myagdi district. The average time taken by the students to complete the items was two hours. The numbers of the students tested in the school were 50. On the basis of item analysis (see Appendix-D) the researcher determined the level of difficulty (p- value) and discrimination index (D- value) of each item of the test, where calculated from the tabulated 24 percent of the highest scores and 24 percent of the lower scores of 66 items. 6 numbers of items were canceling and 10 were modified. After that the refined items prepared. The content and face validity of the test item were established through the experts judgment. The reliability coefficient of the test was found 0.683 out by using split half method. Which indicates the reliability of questionnaire was substantial.

Next tool was the students' questionnaire form which was related to collect the data from students. There were no any items related to their view, value and suggestion. The approved by the experts is also one of the ways to check the validity of the questionnaires, especially for those, which are related to the respondents' own information. In this study, the researcher showed the students' opinionnaire scale form to the experts and made some refinement accordingly and assured its validity. The pilot survey was administered at Aadarsha Secondary School for the clarity of the opinionnaire. Some difficulties were found in the language while conducting the pilot survey. The refinement had been made for some words to make the respondents more clear about the statement.

### ***Data Collection Procedure***

The researcher used the survey design. The researcher preferred here questionnaire survey research. Sample has been drawn from six schools (three from public and three from private) using stratified random sampling method from the Parbat district involving 55 students. The researcher took a written permission from the school administration of each selected school. After getting permission the standardized Mathematics Achievement Test (MAT) was administered to the sample schools' students and the opinionnaire forms was distributed for the students. They were distributed for the students and informed that the test result will not affect their final grade. To conform the reliability and validity of the responses the researcher was convinced that there was not exposed secrecy and sensitive in the work place. After getting response of the students, the opinionnaire was taken back with thanks. Then, the interview was conducted with the help of semi-structured interview schedule, with mathematics teachers of each sample school. The response given by the teachers was arranged in different code as in the conceptual framework.

### ***Data Analysis Procedures***

The researcher calculated the mean and standard deviation of the mathematics achievement test score. The responses of opinionnaire form were converted into quantitative data with five scales- strongly agree, agree, undecided, disagree and strongly disagree with rating scale value 5,4,3,2,1. The researcher used a computer software SPSS version 20 to calculate the data. More specifically; the researcher used the following statistical techniques.

- Descriptive statistics such as mean and standard deviation were used to study the mean achievement scores of grade IX students in mathematic
- The independent t-test at the level of significance  $\alpha= 0.05$  was performed to examine the significance of the different groups and analysis and interpretation.

- The chi-Square test measure the relationship between the variables. It also measured the dependency between variables. So, it was applied in this study.

The finding of any research also depends on the data collection and analysis procedure. It requires systemic planning for the successful completion of any kind of research. The data analysis is a process of transforming data with the aim of deriving useful information and exciting stage.

Student's t-test was used to examine the comparison of MAT between different groups. The mean, SD and t-test were used to analyze the data collected through the students' achievement test. The chi-square test was used to analyze the data collected through the student opinionnaire form. The statistical device  $\chi^2$ -test was applied to all statement of opinionnaire scale at  $\alpha=0.05$  level of significance.

- Descript analysis was done for qualitative data obtained from the semi-structured interview. Describing the findings from previous research, students' opinionnaire and teachers' interviews was described as multivariable analysis.

CHAPTER – IV  
ANALYSIS AND INTERPREATION OF REASULT

The analysis and interpretation of the data are presented in this chapter. For this purpose, data regarding achievement test in Mathematics of grade IX students are collected from the Parbat district. The statistical analysis of the data and obtained results has been reported in this chapter.

Existing students' learning Achievement in Mathematics existing learning achievements in Mathematics of grade IX students of Parbat district have been shown in the following tables.

**Table 5: Mathematics score obtained by grade nine students in Parbat district**

No of students	Minimum	Maximum	Mean	S.D
55	16	58	44.98	8.69

The first research question of the study was to examine the existing status of the grade nine students in mathematics in Parbat district. The data collected through the administration of the mathematics achievement test (MAT) of 55 students of grade IX in the Parbat district were analyzed on the basis of marks scored by the students on the test out of these full marks, the lowest and the highest marks scored by the student in the MAT were 16 and 58 respectively. The mean and standard deviation of the test scores in the MAT were 44.98 and 8.69 respectively. However, if the present achievement level is seen as above, it cannot be accepted as satisfactory because achievement level in this study was below 50%. The present finding should be taken as a sign of Progress rather than pant (2009), Ghimire (2006), CERID (1999) etc. conducted the study on mathematics achievement.

**Table 6: Comparison of students' Achievement in Mathematics by gender**

Group	N	Mean	S.D	t-value
Girl	28	44.28	9.123	1.73
Boys	27	45.71	8.22	

The table 6 shows that the mean achievement and S.D of girls' students were 44.28% and 9.123 respectively. Then mean and S.D of boys students were 45.71 and 8.22 respectively. The calculated t-value is 1.73 and tabulated value  $t_{0.025, 53}=1.96$ . The calculated value 1.73 is less than the tabulated value 1.96. This shows that there was no significant difference in boys and girls score in mathematics achievement test. Educational Development Service Center (EDSC 1999) conducted a research on "National Assessment of grade five students". It was found that the mean scores of boys and girls were 29.56 and 24.64 respectively. Ghimire (2006) found that the mean achievement score between the grade eight students by gender was significant. The mean of boy students were 25.45 and female students were 23.45. The performance of boy students was found to be significantly better than that of girl students at 0.01 levels.

### ***Factors Affecting Achievement on Mathematics***

The information obtained from the opinionnaire and semi- structured interview schedule is analyzed and interpreted in this part. There are several factors affecting the achievement of Mathematics. With the help of related literature and theory, it was assumed that the different six (personal, time, family, school, social and error in problem solving) variables affected the students' achievement in mathematics. Such variables are described separately as follows.

### ***Influence of Personal factor in Achievement on Mathematics***

Theoretically, it was assumed that achievement in mathematics is influenced by the personal factors. Curiousness, prior knowledge, habit and interest toward Mathematics are explained under the personal factors. If the student doesn't have curiousness to learn the teacher cannot teach. Learning is related to prior knowledge so students' prior knowledge helps him to further study and interest of students is also an important determining factor of mathematics' achievement. Student attitude and beliefs also effect the achievement in mathematics. Many articles suggest that students have negative attitude and expectations for their performance in mathematics.

The following five statements define the personal factor that can influence achievement in mathematics at grade IX.

**Table 7: Influence of Personal factor in Achievement on Mathematics**

S.N	Statements	S.A	A	U	D	S.D	df	$\chi^2$ value	Decision
1	I am curious and active while learning mathematics.	6 10.9%	8 14.6%	21 38.2%	13 23.6%	7 12.7%	4	14.000	S
2	Prior knowledge helps us to learn mathematics.	17 30.9%	21 38.2%	6 10.9%	10 18.2%	1 1.8%	4	23.818	S
3	I teach friends which I knew and learn from them which I don't know.	13 23.6%	15 27.3%	12 21.8%	7 12.7%	8 14.6%	4	4.182	Ns
4	My friends help me when I make a mistake.	10 18.2%	19 34.5%	7 12.7%	14 25.5%	5 9.1%	4	11.455	S
5	I am interested to learn mathematics since my childhood.	10 18.2%	12 21.8%	4 7.3%	22 40%	7 12.7%	4	17.091	S

The table 7 shows that four statements are significant and one statement is insignificant at 0.05 level of significance of  $\chi^2$ -test. The first statement 'I am curious and active while learning mathematics' was undecided by 39.2% and 36% student were opposite to this statement. It means, most of the students are not curious while teaching mathematics. The third statement gives the non significant result. This gives the students do not discuss about the mathematical problem between them. The  $\chi^2$ -value of the statement 'Prior knowledge helps us to learn mathematics' is highly significant and more than 63% students' views towards 'The student prior knowledge helps us to learn mathematics.' The fifth statement 'I am interested to learn mathematics since my childhood' was disagreed by more than 50% of the student. It

shows that most of the students were not interested to learn mathematics. Students have positive attitude towards the fourth statement, it shows that students help each other to solve the mathematical problem.

Interviews were taken with the mathematics teacher to get the qualitative information concerning the student personal behavior in achievement in mathematics. The researcher asked the questions related to personal factor and teachers' view. The first question was- What do you think about students' interest in mathematics? The teachers view was that student's felt shy to interact in mathematics class. Likewise the next question was- Do peers groups affect achievement in mathematics? Regarding the question their answer was that the students generally liked to form group and enjoy studying lesson in the class room. If anyone from their group became absent the whole group would become absent. Again there was question-Does prior knowledge affect achievement in mathematics and how? The answer was, *"Yes, most of the student who get poor mark in previous class get low mark, they don't interest in subject matter and who get good mark in previous class give interest and participation in teaching learning process"*.

Most of the teacher views were the interest of learner, studying habits, peer interaction and participation in teaching learning process is the factor that affects the achievement in mathematics.

Hence, from the result analyzed in quantities techniques and responses of mathematics teacher interview it is concluded that the personal factors interest of learner, prior knowledge, studying habit and participation in teaching learning process are main influencing factor in achievement in mathematics.

### ***Influence of Family Related Factors in Achievement of Mathematics***

Family is known as the foundation of life and education. Theoretically, it is assumed that the achievement in mathematics is influenced by the background if their family and their

home environment. Parents' education, family economic condition, study hour at home and environment of studying at home are generally considered as the family related factors. The achievement of the students depends not only on the teachers' but also on the parents' awareness, interest and knowledge about handling and guiding their children at home. The economic status of the parents directly affects the child learning. Most of the researcher have shown that higher the socioeconomic status of family have the greater achievement of children in school level. The roles, responsibilities, opportunities, manage practice time by family to their children in home also played the vital role in achievement in mathematics. The following table is related to the family related factors of students' achievement in mathematics at grade nine.

**Table 8: Influence of family related factors in achievement on mathematics**

S.N	Statements	S.A	A	U	D	S.D	Df	$\chi^2$ value	Decision
1	My parents are educated so, they taught math at home.	10 12.2%	19 34.5%	13 23.6%	8 14.5%	5 9.1%	4	10.364	S
2	My parents manage all required materials for the study of mathematics.	1 1.8%	16 29.1%	12 21.8%	15 27.3%	11 20%	4	12.909	S
3	My parents discuss about my learning progress report with teacher.	6 10.9%	18 32.7%	11 20%	15 27.3%	5 9.1%	4	11.445	S
4	I have a lot of time to study at home.	10 18.2%	12 21.8%	4 7.3%	22 40%	7 12.7%	4	17.091	S
5	Learning environment of mathematics is not better for me at home.	12 21.8%	11 20%	8 14.5%	18 32.7%	6 10.9%	4	7.636	Ns
6	My family manages tuition and extra time for mathematics.	3 5.6%	7 12.7%	11 20%	18 32.7%	16 14.5%	4	14.000	S
7	My parents aspect me to do house hold work when I am at house.	7 12.7%	13 23.7%	11 20%	19 34.6%	5 9.1%	4	10.909	S

The table 8 shows that  $\chi^2$  – value of six statements are significant and one statement is not significant at 0.05 level of significance of  $\chi^2$ –test. The fifth statement ‘learning environment of mathematics is not better for me at home’ give the non significant result; it means students view are not clear. The first statement was accepted by more than 46%, undecided by 23.6% and disagreed by 24.6%. Second statement was disagreed by more than

47% of the student; it means most of the students' parents do not manage their required material for mathematics. More than 52% of the students' views towards fourth statement were opposite; it means, most of the students have no time to study at home. The sixth statement 'My family manages tuition and extra time for mathematics' is highly significant result and most of the students views were disagreed by 47%, agreed only by 19%. From these all statement it can be concluded that family environment is also responsible to the achievement of mathematics at grade nine.

Beside the quantitative data, the researcher had conducted interview to the mathematics teacher to collect qualitative information about the influence of family environment in achievement at grade nine. In course of interview period, the interviews question and the teachers' views were as follows.

Does the home environment affect the mathematics achievement?

*"Learner economic background forces them to be engaged on parents supports. So they are absent in class and cannot complete their homework properly."*

-Teacher

*"Yes, the Parents who are educated they manage time, material and they manage extra class for their children to study mathematics."* -Teacher

By the teacher view it is concluded that time period given by students to learn mathematics at home, parents occupation, extra class managed by parents in home are also the influencing factor in achievement in mathematics at grade nine students.

Hence from the above analysis it can be concluded that parents education, behaviors, occupation, study time at home are the influencing factor in achievement in mathematics.

### ***Influence of school related factors in students' achievement on mathematics***

The study explored one factor that historically has received little attention by educational leaders. Researchers showed that planners should give serious consideration in discussing learning environments outside of the traditional class room, along with more attention should be given to the exterior design of school building. The classroom lighting, color choices, windows, ceiling and ventilation played a vital role in the achievement of mathematics. the teaching materials managed by school, class size, number of students in class room, teacher behavior towards students, responsibilities and opportunities given by school and teacher are main determining factors of achievement in mathematics. The following statements define the positive influence of school environment in achievement on mathematics at grade nine.

**Table 9: Influence of family related factor in achievement on mathematics**

S.N	Statements	S.A	A	U	D	S.D	df	$\chi^2$ value	Decision
1	Mathematics teacher don't teaches regularly in the class.	0 0%	6 10.6%	0 0%	21 38.2%	28 50.9%	2	13.782	S
2	The mathematics class is interesting when the teacher teach using teaching instruments.	17 30.9%	24 43.6%	9 16.4%	3 5.6%	2 3.6%	4	32.182	S
3	Our mathematics teacher is qualified to teach mathematics.	16 29.1%	18 32.7%	11 20%	7 12.7%	3 5.6%	4	14.000	S
4	Our class size is sufficient to do class activities.	8 14.5%	8 14.5%	5 9.1%	13 23.6%	21 38.2%	4	14.364	S
5	The teacher teaches well in the tuition class but not in regular class.	8 14.5%	17 30.9%	13 23.6%	6 10.6%	11 20%	4	6.727	Ns
6	The teacher runs the course giving the focused only on good or excellent student.	6 10.6%	3 5.6%	21 38.2%	20 36.4%	5 9.1%	4	27.818	S
7	Teacher gives class work as well as home work and checks it regularly.	4 7.2%	10 18.2%	1 1.8%	20 36.4%	20 36.4%	4	28.364	S

The table 9 shows that  $\chi^2$  – value of six statements out of seven are significant at 0.05 level of significance. The  $\chi^2$  – value of the statement ‘ the mathematics class is interesting when the teacher teach using teaching instruments’ is highly significant and most of the student agreed with this statement, it means if the teacher use teaching material related to the subject matter student can learn easily. The first statement shows that most of the mathematics’

teachers teach regularly in class. But in the fifth statement shows that the students' views was not clear about the teacher teaches well in the tuition class or the regular class. The third statement shows that most of the teachers are qualified. Around 61% of the student disagree the statement 'Our class size is sufficient to do class activities.' It shows that the class size is not sufficient for teaching learning activities. Most students was disagreed the statement 'the teacher gives class work as well as home work and checks it regularly.' It shows that the mathematics teacher didn't give class work and homework and checks it regularly. Due to this reason the achievement of mathematics at grade nine students became low.

In addition to surveying the factor affecting the achievement in mathematics, the researcher had taken interview with teacher for qualitative information. The teachers' views regarding this school related variables were due to the large number of the students in a class room, individual care was not possible to be given to the students. It was difficult to handle the large mass, so generally they illustrate some problem and tell the students to do the problem given in the text. Due to the large number of students in a class and over load of period they cannot check students' homework properly and give them suggestion. In school concrete instructional materials are not available and the blackboards are crumbled and not large in size and not sufficient benches and desks, roofs are made of tin which creates problem in rainy, windy and sunny season make difficult to learn. Most of the teachers' views were qualification and experiences of teacher affect achievement in mathematics. The teacher whose qualification as well as experience in subject matter is good their students' achievement is good then other.

By the teacher view school facilities, class size, teacher qualification, teaching material and schools' location are the main factors that affect the achievement of mathematics at grade nine.

Hence from the above discussion it can be concluded that number of student in a class, schools' physical facilities, teachers' qualifications and suitable instructional material which is related to school related factor is also the case of low achievement in mathematics.

### ***Influence of Social variable in Achievement in Mathematics***

Theoretically it was reviewed that culture and social factors are responsible for the achievement in mathematics. The different social variables such as literacy rate, cultural system, gender business and social system are the main factors that affect the achievement in mathematics. The following six statements define the social factors which affects on achievement in mathematics.

**Table 10: Influence of social variable in achievement on mathematics**

S.N	Statements	S.A	A	U	D	S.D	df	$\chi^2$ value	Decision
1	There are literate people in our society.	11 20%	15 27.3%	4 7.3%	14 25.6%	11 20%	4	6.727	Ns
2	Our society has no idea whether the subject matter of mathematics' is good or bad.	7 12.7%	6 10.9%	11 20%	15 27.3%	16 29.1%	4	7.455	NS
3	Society gives an inferior place to girl students.	20 36.4%	16 29.1%	9 16.4%	3 5.6%	7 12.7%	4	17.273	S
4	Our society unequally treats boys and girls.	7 12.7%	17 30.9%	17 30.9%	10 18.2%	4 7.3%	4	12.545	S
5	The society does not inspire to learn mathematics.	21 38.2%	8 14.5%	6 10.9%	13 23.6%	7 12.7%	4	14.00	S
6	Society feels the mathematics is an essential part of daily life.	6 10.9%	3 5.6%	21 38.2%	20 36.4%	5 9.1%	4	27.818	S

In the table-10 four statements are significant and two are insignificant at 0.05 level of significance of  $\chi^2$  test. The statement first and second give non significant result which means the society has equally literate and illiterate people. The third statement 'Society gives an

inferior place to girl' was agreed by more than 65% of observed student. It means that society does not give equal place to girl and boys students. More than 60% students agree the statement 'The society does not inspire to learn mathematics.' Sixth statement 'Society feels the mathematics is an essential part of daily life' was agreed by 45% students. Which indicate, the social variable which includes social system, literacy rate and traditional behaviors directly influence in achievement of mathematics.

In addition to surveying the factor that affects the achievement in mathematics the researcher had taken interview with the mathematics teacher for qualitative information. The teachers' views and interviews question towards the social factors were as follows.

How do you think, is the social variables affect the achievement of mathematics?

*"The society has many problem, the declining rate of the result of Math decreasing environment are one grate problems in the bad effect of the achievement of children. Parent's bad behaviors' are also major parts in their bad result; playing cards in front of the students in the society have made students unable to practice of math in their home,"*

-Teacher

What is the view of society towards mathematics?

*"Some of the people in the society feel the mathematics is the reason of failed so they have still concept that mathematics is the subject that can do only selected student."*

- Teacher

Is the society unequally treats boys and girls?

*"Of course, it is depends upon economic, religious and cultural condition of society; but now a day's most of the society treats equally boys and girls."*

-Teacher

Hence students' views and teachers' views towards the social factors were there is still a concept that mathematics is the subject that can do only selected student. Some of the people feel the mathematics is a reason of failed so they have bad image towards the subject. Bohara and Paudel also found that social factor affect achievement of mathematics. So, it is conclude that achievement of mathematics is influenced by social variable.

***Influence of Error in Problem Solving In Achievement on Mathematics***

It was reviewed that error in problem solving is also influencing factor of achievement in mathematics. Reading error, comprehension error, transformation skill error, encoding error is considered as the error in problem solving. If the student couldn't read a key word or symbol it is reading errors. The comprehension error is an error in which the student can't find the meaning of the problem. The translation error is an error in which the student have no idea to identify the operation needed to solve the problem and skill error is an error in which the student able to identify the correct operation but did not know the procedure to solved the problem. Encoding error is an error in which the student cannot solve the problem in an acceptable written form. The following statements given in the tabe-11 is related to error in problem solving in mathematics at grade nine.

**Table 11: Influence of error in problem solving in achievement on mathematics**

S.N	Statements	S.A	A	U	D	S.D	Df	$\chi^2$ value	Decision
1	I feel hard to comprehend the overall meaning of mathematical problem.	17 30.9%	21 38.2%	6 10.9%	10 18.9%	1 1.8%	4	23.878	S
2	I need the help of teacher to solve any problem of mathematics.	13 23.6%	21 38.2%	9 16.4%	9 16.4%	3 5.6%	4	16.00	S

3	I cannot find myself the wrong of any mathematical problem.	6 10.6%	8 14.5%	21 38.2%	13 23.6%	7 12.7%	4	14.000	S
4	I always make mistake in solving the mathematical problems.	20 36.4%	16 29.1%	6 10.9%	11 20%	2 3.6%	4	19.271	S

The table-11 shows that all statements are significant at 0.05 level of significance of  $\chi^2$ -test. Here, around 70% of the students agree with the statement ‘I feel hard to comprehend the overall meaning of mathematical problem.’ Most of the students agree towards the statement ‘I need the help of teacher to solve any problem of mathematics.’ The last statement ‘I always make mistake in solving the mathematical problems’ was agreed by more than 65%. From these it can be concluded that most of the students feel difficult in comprehending the overall meaning of mathematics, solving the mathematical problems and finding any mistake in mathematical problem. So, it is concluded that the error in problem solving is also a cause of low achievement in mathematics.

On the other hand the researcher had taken interview with teacher for qualitative information. The representative teachers’ views regarding this variable and those questions were as follows.

What kind of error is made by student while solving mathematical problem?

*“All kind of error affects the achievement of mathematics. Some student cannot read mathematical symbols and its meaning within the end of the session.”*

-Teacher

The teacher’s view was that students can’t read and comprehend the mathematical problem but they are unable to use properly in problem solving, language of mathematical problem is also the factor that affects achievements of mathematics and basic concept of other subject is equally important for learning mathematics.

Hence from the above discussion it can be concluded that the errors in problem solving is the case of low achievement in mathematics.

### ***Influence of Time Factor in Achievement of Mathematics***

After gaining the mathematical concept or knowledge, the most important thing is to make it long lasting. To make it permanent drill, review and maintenance are the main factors. Appropriate drills not only develop the knowledge and skill in students but also it develops the habit of practice. Revision of mathematical concept is one of the most important factors in learning process. The main purpose of review is to organize and retain learning. It provides new motion to the student. At last the most important factor to permanent of the learning is maintenance. It prevents the student to forget the mathematical concept, skills and relations. The following statements given in table 12 are related to time variable that could create positive environment of the students in the achievement in mathematics at geode nine.

**Table 12: Influence of time factors in achievement on mathematics**

S.N	Statements	S.A	A	U	D	S.D	df	$\chi^2$ value	Decision
1	The course of mathematics is not complete in the time.	13 23.6%	24 43.6%	0 0%	14 25.6%	4 7.3%	3	14.600	S
2	I always complete mathematics home work.	4 7.3%	13 23.6%	4 7.3%	21 38.2%	13 23.6%	4	18.727	S
3	I keep on practice of already taught mathematical problem.	7 12.7%	5 9.1%	11 20%	16 29.1%	16 29.1%	4	23.818	S
4	I manage time to study mathematics.	3 5.6%	8 14.5%	11 20%	18 27.3%	15 27.3%	4	12.545	S

5	The time is enough to take extra mathematics class.	3	9	6	9	21	4	16.183	S
		5.6%	16.4%		16.4%	38.2%			

The table 12 shows the  $\chi^2$ -value of five statements is significant at 0.05 level of significance. More than 67% of the students are agreeing the statement ‘the course of mathematics is not completed in time.’ More than 60% student disagree the statement ‘I always complete mathematics’ homework’ and more than 50% student disagree to the statement ‘The time is enough to take extra mathematics class.’ From these it can be concluded that most of the students do not give more time in studying, reviewing the mathematical problem. Due to this reason the achievement of mathematics became low. At least it is concluded that time factor is also an influencing factor that affects an achievement in mathematics.

Beside this qualitative analysis the researcher also took interview with the math teachers for qualitative information. The teachers’ views regarding this time variable were also similar with the above result. Some representative interviews questions and teachers views were as follows.

How is the interest of student to study mathematics?

*“Most of the students are not making practice of math in their house because of the different level of math. They study other subjects for a long time but mathematics is not favorite subject for them. Most of the time students are very care less for their teaching learning.”*

-Teacher

The teacher focus on the drill, practice and maintenance or reviewed of studied lesson done by students is the main factors for achieving good or bad result in mathematics. They also suggest that especially the students who manage time to solve the mathematical problem do

well and who don't give more time to study mathematics is the main cause of low achievement in mathematics.

From the above discussion, it can be concluded that the minimum time given by students in mathematics is also the cause low achievement in mathematics.

## CHAPTER – V

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter is basically concerned in deriving some findings and conclusions from the discussion of the previous chapter. Moreover, it has even some recommendations which will be useful for further studies and educational implications.

#### ***Summary and Finding***

The study was concerned with the factors influencing the achievement of mathematics at grade nine students'. There were so many factors associated with students' achievement in mathematics in which the researcher focused mainly six factors in the conceptual framework. They were students' personal factors, family related factors. School related factors, error in problem solving, social factors and time factors. This model describes students learning as a function of their personal related factors, family related factors, error on problem solving, school related factors and time factors. The students' personal factors comprise variables such as curiousness, prior knowledge, studying habit and peer interaction of students. The family related factors include variables such as parental education, occupation and economic condition of family. The school related factors comprise variables such as class size, mathematics teachers' qualification and teaching experience of mathematics teachers. The social related factors included variables were literacy rate of society, social system, cultural customs and train of society. The error of problem solving were reading error, comprehension error, process skill error and encoding error and the time related variables were drill, review and maintenance.

The purpose of this study was to analyze the present achievement level of the grade nine students in mathematics and to determine the factors affecting achievement in

mathematics. The population of the study consisted of all students at grade nine in the academic year 2067/068 of Parbat district. For the survey purpose the researcher employed convenient sampling techniques to select the sample schools in first stage. Among 85 secondary school of Parbat districts, six were selected. Three of them were public and three of them were private. All student of grade nine was the sample students of sample school. Among them only 55 students were selected for implementing the achievement test and opinionnaire scale.

The researcher used an achievement test, one set of opinionnaire scale and one set of semi structured interview schedule for collecting information. The result obtain from achievement test was analyze by using t-test. The opinionnaire scale was developed on the basis of Likert five point techniques. The collected data from opinionnaire scale were analyzed by using spss program for  $\chi^2$  -test in 0.05 level of significance. Interview was carried out to the mathematics teachers of the selected sample school. The data obtained from interview were analyzed by descriptive method. Then the researcher sustaining as triangulation to the quantities analysis result from the quantitative information of achievement teat and opinionnaire scale and qualitative analysis result from qualitative information from the interviews. From the analysis of the data at the end the researcher found the major findings of the study are as follows.

- The existing mean achievement score in mathematics of grade nine students of Parbat was 44.49% with S.D. 8.69
- The mean achievement scores of girls student was 44.28% with S.D. 9.13 and their boys was 45.71% with S.D 8.22. There is no significant difference between boys' and girls' students score in mathematics achievement test.

- Students' personal factors curiousness, prior knowledge, peer group and interest directly influence on achievement of mathematics.
- It is found that home environment such as parents' education, economic condition and studying environment at home influence in the students achievement in mathematics.
- The school environment such as physical facilities, number of students, teachers' qualifications and teaching learning process affects the achievement in mathematics.
- The social factor such as social system, cultural custom, traditional effects of gender, views towards subject matter directly influence the achievement of mathematics.
- From the analysis it is found that all of the students feel difficulty in reading, comprehend the meaning of mathematical problem and make mistake in solving the mathematical problems. Due to this case, they cannot do better and achievement of mathematics is low.
- It is said that "Practice make a man perfect" so practice, review and implementation of mathematical concepts affects in the achievements in mathematics.

### ***Conclusion***

Mathematics is one of the most important subjects offered at secondary level of education. The performance of students in mathematics is poor. Based on findings of this study, it can be concluded that the students are probably weak in foundation of mathematics. School students' weak performance in mathematics is evidence of their weakness in it. It could be because of poor achievement at primary and lower secondary level.

The students' achievement is affected by their low level of the involvement in the students' studies contributed to the low level of students' achievement in mathematics. Parents' education affects the students' mathematics achievement. To increase achievement in mathematics, their mother and father who are with them must be educated. To increase

achievement of students in mathematics high, qualified teachers are to be managed. The person in the society must be educated so they have good idea towards education. Social value must be equity for boys and girls. It is felt that girls are unable to catch the mathematical ideas what boys do. But it is not scientific because in this research and much different research have shown that girls are also equally capable to do mathematics with boys.

### ***Recommendation for Future Study***

- The study was limited only to Parbat district. A large sample would help to validate the conclusion made in this research. It will be more generalized if it is undertaken nationally.
- The other variables psychological variables and demographic variables may be explored.
- A comparative study of the achievement of primary, lower secondary, secondary as well as higher secondary level student may be taken up.

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## Appendix-A

Mathematics Achievement Test

Grade: IX

Full

mark:66

Subject: Mathematics

Time:2hrs

Instructions:

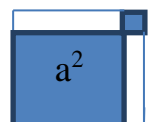
The tests prepared based on mathematics curriculum of grade eight. This test will be used only for research purpose. The marks so obtained do not influence the school result. Students are advised to read the each question carefully and tick( ) one of the best answer.

- If  $A = \{ a, b, c, d \}$ ,  $B = \{ b, c, e \}$  and  $C = \{ a, b, c, d \}$  then  $A \cap (B - C)$  is
  - $\{ b \}$
  - $\{ a, b \}$
  - $\{ a, c, e \}$
  - $\{ a, b, c, d \}$
- If  $\cup = \{ a, e, i, o, u \}$  and  $A = \{ o, u \}$  what is  $\bar{A}$  ?
  - $\{ a, e, i \}$
  - $\{ o, u \}$
  - $\{ a, e, o \}$
  - $\{ a, e, i, u \}$
- If  $U = \{ 1, 2, 3, \dots, 9 \}$  and  $A = \{ 1, 2, 3, 4, 5 \}$  which is true?
  - $A \subset U$
  - $U \subset A$
  - $A \in U$
  - $A \notin U$
- What are the digits used in binary number system?
  - 1 and 0
  - 0 and 5
  - 1 and 5
  - 5 and 2
- What is the value of  $123_5$  in decimal system?
  - 24
  - 25
  - 38
  - 39
- What is the value of  $\sqrt{3^2 - 2}$ 
  - 2
  - 3
  - 4
  - 5
- The area of a square is  $196\text{cm}^2$  what is the length of the side of this square.
  - 12cm
  - 13cm
  - 14cm
  - 16cm
- The voters in Nepal is 12,000,000 what is the scientific notation of this?
  - $12 \times 10^7$
  - $120 \times 10^7$
  - $1.2 \times 10^7$
  - $12 \times 10^6$
- Which one of the following is irrational number?
  - $\sqrt{4}$
  - $\sqrt{5}$
  - $\sqrt{9}$
  - $\sqrt{16}$
- What is the ratio of 75cm and 1meter?
  - 1:2
  - 2:3
  - 3:4
  - 4:5
- If  $k:3 = 10:15$ . What is the value of k?
  - 1
  - 2
  - 3
  - 4
- Which of the following relation is applicable to find the sum of principal?
  - $\frac{PTR}{100}$
  - $\frac{IX100}{PR}$
  - $\frac{IX100}{TR}$
  - $\frac{IX100}{PT}$
- There were 500 students and 75% of them were passed. What is the number of failed student?
  - 125
  - 250
  - 300
  - 375
- 5 men can do a piece of work in 4 days. How many days do 2 men taken to complete it?
  - 8
  - 10
  - 11
  - 20

15. What is the selling price of camera with marked price Rs 3000 and discount of 15% is offered?  
 a) 420                      b) 2500                      c) 2550                      d) 2985
16. If sp, cp, G represents selling price, cost price and gain respectively. Which of the following relation is fit for finding gain percentage?  
 a)  $\frac{cp-sp}{cp} \times 100$                       b)  $\frac{sp-cp}{cp} \times 100$                       c)  $\frac{cp-sp}{sp} \times 100$                       d)  $\frac{sp-cp}{sp} \times 100$
17. How long does Rs 500 take to earn interest Rs 50 at the rate of 10% per annum?  
 a) 3 month                      b) 4 month                      c) 6 month                      d) 1 year
18. What is the value of x, if the arithmetic mean of 2,3, x and 5 is 5?  
 a) 4                      b) 5                      c) 6                      d) 10
19. What is the mean of 4,5,3,6,7?  
 a) 3                      b) 4                      c) 5                      d) 6
20. Which of the following class interval represents the mode?

Marks	0-10	10-20	20-30	30-40
NO of students	5	10	6	3

- a) 0-10                      b) 10-20                      c) 20-30                      d) 30-40
21. What do we call the difference between the largest and smallest items in given data?  
 a) Median                      b) mean                      c) range                      d) mode
22. Which of the following formulae do we use to compare mean?  
 a)  $\sum fx$                       b)  $\frac{\sum fx}{N}$                       c)  $\frac{fx}{N}$                       d) fx
23. What is the degree of the expression  $3x^2y^2z$ ?  
 a) 3                      b) 4                      c) 5                      d) 6
24. If  $(a+b)(a-b) = a^2-b^2$ , use it into find the value of  $(100-2)(100+2)$ ?  
 a) 9096                      b) 9900                      c) 10004                      d) 10002
25. What is the product of  $(x+5)$  and  $(x-2)$ ?  
 a)  $X^2-10$                       b)  $x^2-3x-10$                       c)  $x^2-3x+10$                       d)  $x^2-3x-10$
26. If  $a^m \times a^n = a^{m+n}$ , what is the value of  $a^{m+n} \div a^n$ ?  
 a)  $a^m$                       b)  $a^{-m}$                       c)  $a^{-n}$                       d)  $a^n$
27. What is the L.C.M of  $x^2-1$  and  $x+1$ ?  
 a)  $X^2 -1$                       b)  $x -1$                       c)  $x+1$                       d)  $(x-1)^2$



28. Which of the following algebraic expression represents the square ABCD?  
 a)  $A^2-b^2=(a+b)(a-b)$                       b)  $(a-b)^2= a^2-2ab+b^2$                       c)  $(a+b)^2 = a^2 +2ab +b^2$                       d)  $a^2+b^2= (a+b)^2-2ab$

29. If  $a + \frac{1}{a} = 3$ , what is the value of  $a^2 + \frac{1}{a^2}$ ?

- a) 6      b) 7      c) 8      d) 9

30. What is the simplified form of  $\frac{x}{x-7} + \frac{7}{7-x}$ ?

- a)  $\frac{1}{7}$       b)  $\frac{1}{2}$       c) 1      d) 7

31. Find the value of x:  $5(x-3) = 2x+9$

- a) 6      b) 7      c) 8      d) 9

32. What is the value of y to fill the given table in

equation?  $y = \frac{3x+2}{2}$

- a) -4      b) -2      c) -8      d) 2

X	-6
Y	....

33. What is the slope of the line joining the points (2,3) and (3,2)?

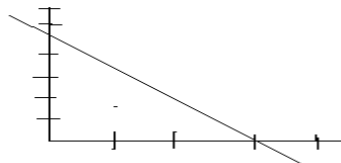
- a) 1      b) -1      c) 5      d) -5

34. Solve:  $x^2 - 25 = 0$

- a) 5      b) -5      c)  $\pm 5$       d) all of the above

35. In figure, which is the value of x intercept?

- a) 2      b) 3      c) -2  
d) 4



36. If  $A < B$  and  $C > 0$ , which of the following relation is correct?

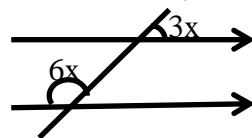
- a)  $AC < BC$       b)  $A - C > B - C$       c)  $\frac{A}{C} > \frac{B}{C}$       d)  $A + C > B + C$

37. If  $x < -1$ , what is the value of y in the equation  $y = 3x - 2$ ?

- a)  $y \leq -5$       b)  $y > -5$       c)  $y = -5$       d)  $y < -5$

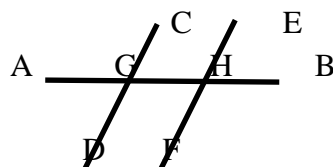
38. In the figure what is the value of x?

- a)  $10^\circ$       b)  $20^\circ$       c)  $30^\circ$       d)  $40^\circ$



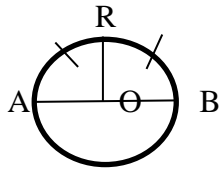
39. The pair of angle  $\angle CBG$  and  $\angle AHF$  is called as.

- a) Alternative      b) corresponding  
c) Co-interior      d) Adjacent



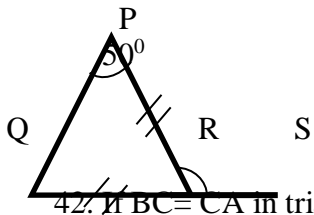
40. In the figure what is the value of  $\angle BOR$ ?

- a)  $105^\circ$       b)  $115^\circ$       c)  $150^\circ$       d)  $165^\circ$



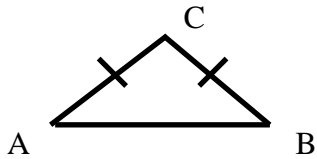
41. What is the value of angle PRS in the given isosceles triangle PQR?

- a)  $60^\circ$       b)  $90^\circ$       c)  $100^\circ$       d)  $50^\circ$



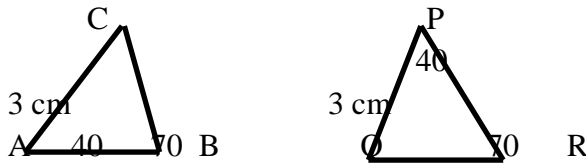
42. If  $BC = CA$  in triangle ABC, which is true?

- a)  $\angle A = \angle B = \angle C$     b)  $\angle B = \angle C$   
 c)  $\angle C = \angle A$       d)  $\angle A = \angle B$



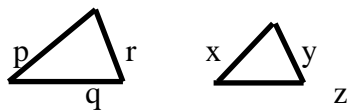
43. According to which statement the triangles ABC and PQR are congruent?

- a) ASA      b) AAs      c) SAS      d) SSS



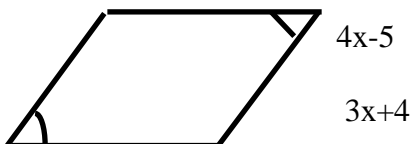
44. What is the relation between the triangle ? ( given that  $p:x=a:y=r:z$ )

- a) Similar      b) congruent  
 c) a and b      d) none



45. What is the value of x in the parallelogram?

- a)  $9^\circ$       b)  $18^\circ$       c)  $27^\circ$       d)  $36^\circ$



46. Which formula do we use to find the interior angle of a regular polygon?

- a)  $(n-2)180^0$       b)  $\frac{n-2}{n} \times 180^0$       c)  $\frac{n-2}{n} \times 360^0$       d)  $\frac{360}{n}$

47. In a house a 5m long ladder touches 4m above the ground. What is the distance between the wall and end of the ladder?

- a) 3m      b) 4m      c) 5m      d) 6m

48. Which relation do we use represent the statement “in any right angled triangle, the square on the hypotenuse equals the sum of the squares on the other two sides”?

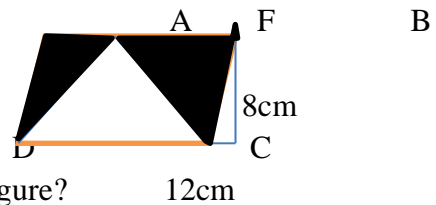
- a)  $P^2=h^2+b^2$       b)  $h^2= p^2+b^2$       c)  $b^2=p^2-h^2$       d)  $h^2=(p+b)^2$

49. What is the radius of a circular pond of area  $16m^2$ ?

- a) 4m      b) 2m      c) 16m      d) 8m

50. What is the area of shaded region?

- a)  $12cm^2$       b)  $16cm^2$   
c)  $48cm^2$       d)  $24cm^2$



51. What is the area of the trapezium in the figure?



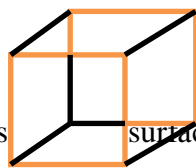
- a)  $15cm^2$    b)  $20cm^2$       c)  $25cm^2$       d)  $35cm^2$

52. What is the circumference if the circular plate of radius 7cm?

- a) 11cm      b) 22cm      c) 44cm      d) 88cm

53. What is the shape of the given geometrical figure?

- a) Cuboid      b) rectangle      c) cube      d) conical



54. What is the surface area of a cylinder having base radius 2cm and height 5cm?

- a)  $11cm^2$       b)  $22cm^2$       c)  $44cm^2$       d)  $88cm^2$

55. What is the altitude of a triangle of area  $25cm^2$  and base 10cm?

- a) 2cm      b) 3cm      c) 4cm      d) 5cm

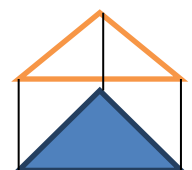
56. Find the actual distance between two places if the places are 5cm apart in a map. Given that the scale  $2cm = 5km$ .

57. The box alongside is the triangular prism. If base area is  $15cm^2$  and height 30cm, how many liters of water can it hold?

- a) 1      b) 3  
c) 4.5      d) 6

58. A quadrilateral having any two sides parallel is called.

- a) Trapezium      b) parallelogram      c) rhombus



- d) Square
59. The distance between bases of trapezium is called its'.
- a) Altitude                      b) medians                      c) legs                      d) bases
60. Which is a regular polygon?
- a) Triangle                      b) rhombus                      c) square                      d) rectangle
61. Which of the following is not parallelogram?
- a) Rectangle                      b) rhombus                      c) square                      d) trapezium
62. The length of rectangle is 10 cm and breadth is 6 cm. what is the area of rectangle?
- a)  $16\text{cm}^2$                       b)  $32\text{cm}^2$                       c)  $160\text{cm}^2$                       d)  $60\text{cm}^2$
63. In geometry a point id a geometrical figure which has.
- a) Length but no breadth                      b) no length and no breadth                      c) length and breadth                      d) breadth but not length
64. The inclination between two straight lines when they meet a point is called.
- a) Curve   b) line                      c) point                      d) angle
65. The angle which is greater than 90 but less than 180 is called.
- a) Obtuse angle                      b) acute angle                      c) right angle                      d) reflex angle
66. Which is the interior angle of the square?
- a)  $45^0$                       b)  $60^0$                       c)  $90^0$                       d)  $180^0$

The end

## Appendix-B

### Opinionnaire for Students

Dear students,

I am a student of M.ED. Major Mathematics. I have tried to prepare a thesis on “Factor Affecting Mathematics Achievement of Student at Secondary Level” for my Master’s Degree of Education. There are 34 statements concerned with achievement of mathematics. There is no right or wrong answer. The right answer is your own opinion of feelings. Please, read the statements carefully and give your own opinion about the intensity of statement by putting tick mark (√) on any one of the five rating of each statements.

Here,

S.A.= Strongly Agree

A= Agree,

U = Undecided

D= Disagree

S.D.= Strongly Disagree

Name of student:.....

Date:.....

School:.....

Sex:.....

Class:.....

Roll No:.....

Address:.....

S. N	Statements	S. A	A	U	D	S. D
1	I am curious and active while learning mathematics.					
2	Prior knowledge helps us to learn mathematics.					
3	I teach friends which I knew and learn from them which I don't know.					
4	My friends help me when I make a mistake.					
5	I am interested to learn mathematics since my childhood.					
6	My parents are educated so, they taught math at home.					
7	My parents manage all required materials for the study of mathematics.					
8	My parents discuss about my learning progress report with teacher.					
9	I have a lot of time to study at home.					
10	Learning environment of mathematics is not better for					

	me at home.					
11	My family manages tuition and extra time for mathematics.					
12	My parents expect me to do house hold work when I am at house.					
13	Mathematics teacher don't teaches regularly in the class.					
14	The mathematics class is interesting when the teacher teach using teaching instruments.					
15	Our mathematics teacher is qualified to teach mathematics.					
16	Our class size is sufficient to do class activities.					
17	The teacher teaches well in the tuition class but not in regular class.					
18	The teacher runs the course giving the focused only on good or excellent student.					
19	Teacher gives class work as well as home work and checks it regularly.					
20	There are literate people in our society.					
21	Our society has no idea weather the subject matter of mathematics' is good or bad.					
22	Society gives an inferior place to girl students.					
23	Our society unequally treats boys and girls.					
24	The society does not inspire to learn mathematics.					
25	Society feels the mathematics is an essential part of daily life.					
26	I feel hard to comprehend the overall meaning of mathematical problem.					
27	I need the help of teacher to solve any problem of mathematics.					
28	I cannot find myself the wrong of any mathematical					

	problem.					
29	I always make mistake in solving the mathematical problems.					
30	The course of mathematics is not complete in the time.					
31	I always complete mathematics home work.					
32	I keep on practice of already taught mathematical problem.					
33	I manage time to study mathematics.					
34	The time is enough to take extra mathematics class.					

## Appendix - C

### Guidelines for Interview with Secondary Math Teacher

Date of interview:-.....  
Name of teacher:-.....  
Qualification:-..... Religious:-.....  
Trained/untrained:-..... Sex:-.....  
Teaching experience:-..... Age:-.....  
Address:-.....VDC/Municipality Ward no:-.....

The interview with mathematics teacher will take under the following topics.

- Teaching strategies of geometry
- Home environment
  
- School environment
  
- Probable error during geometric problem solving
  
- Social variables and girls achievement
  
- Study time

### Interview questions for Teachers

1. Which are the most responsible factors for low achievement in mathematics?
2. Do you check students' homework and give them suggestions regularly?
3. What kind of teaching strategy use to teach mathematics?
4. How do you think, is the school environment is suitable for studying mathematics?
5. How do you manage your mathematics class and what are the main problems in the class?
6. Do peers groups affect achievement in mathematics?
7. Is motivation affect teaching mathematics and how?
8. Does the home environment affect the mathematics achievement?
9. How is the interest of student to study mathematics?
10. How do you think, is the social variables affect the achievement of mathematics?
11. What is the view of society towards mathematics?
12. Do student solve mathematics problem properly?
13. What kind of error is made by student while solving mathematical problem?
14. Do you complete mathematics course in time?
15. What may be the other problem factors could affect the achievement in mathematics?
16. Does the teacher qualification and experiences affect achievement in mathematics?
17. Is the society unequally treats boys and girls?

The End



**Appendix-D**  
**Item analysis of the test**

Students	Upper 24% of students												Lower 24% of students												p-value	D-value	Remarks
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
1	1	0	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	25	0.33	modify
2	0	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	42	0.33		
3	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	1	0	1	0	0	58	0.67		
4	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	1	0	59	0.83		
5	1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	42	0.83		
6	0	1	0	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	25	0.33	modify	
7	1	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	25	0.50		
8	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	0	1	0	0	75	0.50		
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	96	0.083	Cancel	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	92	0.16	modify	
11	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	0	0	0	0	1	0	0	0	50	0.67		
12	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	1	0	1	0	0	1	71	0.42		

13	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	0	0	0	0	1	1	0	0	0	54	0.58	
14	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	88	0.25	
15	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	75	0.16	
16	0	1	0	1	0	1	1	1	1	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	46	0.41	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	1	0	1	0	71	0.59	
18	0	1	0	1	0	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	38	0.25	
19	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	50	0.67	
20	0	0	1	0	0	1	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	30	0.83	
21	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	46	0.75	
22	1	0	1	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1	42	0.16	modify
23	1	0	1	1	1	1	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	38	0.59	
24	1	0	1	1	1	0	0	1	1	1	0	1	0	0	0	0	1	0	0	1	1	0	0	1	50	0.34	
25	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	29	0.41	
26	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	13	0	cancel
27	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0	0	0	1	0	0	1	1	1	1	67	0.33	
28	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	17	0	cancel
29	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1		0	0	0	1	1	0	0	017	-0.083	cancel	
30	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1	1	38	0.83	
31	1	1	1	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	38	0.83	

32	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	67	0.67	
33	1	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	34	0.50		
34	1	1	1	1	1	1	0	0	1	1	1	1	0	1	0	1	0	1	0	1	1	1	0	0	67	0.34		
35	0	1	0	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1	0	1	0	1	1	1	67	0.17		
		1																										
36	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	0	0	0	1	1	0	1	1	0	67	0.50		
37	1	0	1	0	1	1	1	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	75	0.0	Cancel	
38	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	0	1	0	0	0	1	0	0	63	0.58		
39	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	55	0.25		
40	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	1	0	0	1	1	75	0.17	modify	
41	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	88	0.25	
42	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	1	0	0	1	0	1	67	0.67	
43	0	1	1	1	0	1	1	0	1	1	1	1	1	0	0	0	1	1	0	0	1	0	1	0	0	55	0.41	
44	1	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	34	0.17	modify
45	1	1	1	0	1	1	1	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	46	0.58	
46	1	1	1	1	1	1	0	0	1	1	1	1	0	1	0	1	0	1	0	1	1	1	0	0	67	0.34		
47	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	1	0	1	0	0	1	1	71	0.42		
48	0	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	0	46	0.41		
49	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	1	0	0	0	71	0.58		

50	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0	0	1	0	0	42	0.83	
51	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0.83	
52	0	0	0	0	1	0	1	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	25	0.33	modify
53	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	92	0.16	modify	
54	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	50	0.67		
55	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	0	0	1	1	71	0.42		
56	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	0	1	1	71	0.42			
57	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	88	0.25	Modify		
58	1	0	1	1	1	0	0	1	1	1	0	1	0	0	0	0	1	0	0	1	1	0	0	1	50	0.34			
59	0	1	0	1	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	34	0.41			
60	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	17	0	Cancel		
61	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0	0	0	1	0	0	1	1	1	1	67	0.34			
62	1	0	0	1	0	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	38	0.25			
63	0	0	1	0	1	1	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	30	0.083	Cancel		
64	0	0	1	1	0	1	1	1	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	75	0.50			
65	1	1	0	1	1	0	1	0	0	1	1	1	0	0	0	1	1	0	0	1	0	1	0	0	55	0.41			
66	1	1	1	1	1	1	0	0	1	1	1	1	0	1	0	1	0	1	0	1	1	1	0	0	67	0.34			