

## Chapter I

### INTRODUCTION

#### Background of Study

Mathematics, an essential discipline of human life relating to every step, is initiated through the ancient human civilization. According to New Standard Dictionary of English language Funk and Wagnalls (2000), “Mathematics is the science that treats of quantity or magnitude and of their measurement especially by the use of symbols and that investigates deductively the special, serial and numerical relation existing between objectives of perception, in wider sense, the group of allied science concerned with the concrete application of such data.”

There are several factors responsible for the achievement in mathematics of school going children. Those factors may be home environment, instructional materials, individual difference, peer group, parents attitudes and socio-economic status etc.

Socio-economic status (SES) is a term used by social scientists and sociologists to describe the position of an individual in a hierarchical social structure, which includes both the social and economic status. Extensive research in the sociology of education offers conclusive evidence of a positive relationship between family socio-economic status (SES) and the academic achievement of students. Socio-economic status includes both the social and economic status of an individual in the group. It is known that socioeconomic factors have an influence on mathematical achievement. The discussion on what may be the socioeconomic influence on mathematical achievement emerged from general social science research and educational research. The relationship between socioeconomic factors and school

achievement is inserted in the history of expansion of mass education systems and differential access to education around the world during the 20th century. 'Socio-economic status' may include so many factors such as parental education, occupation, income etc. SES as the relative position of individuals or families within a hierarchical social structure, based on their access to, or control over, wealth, prestige, and power. Thus, to study the children's achievement in a particular subject, it is very much important to investigate their family background or in other words 'socio-economic status' of their family (Das & Sinah, 2017).

Socio economic status is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position relative to others, based on income, education, and occupation. It also implies certain inequalities. Definitions of socio economic status (SES) typical include mention of social status (position, rank) and economic indexes (wealth, education). Today many definitions of SES include the idea of capital (resources, assets). Capital includes financial and material resources (income assets), human or nonmaterial resources (parental education), and social resources (those obtained through social networks and connections). In the present study, the effect of socio-economic status on performance in mathematics of secondary level students has been investigated.

In the context of Nepal the concept of school student does not seem to be positive for mathematics learning. So the result of final examination of school level being very poor especially in mathematics all over in Nepal. Many students give more emphasis for passing exam rather than learning by understanding. They try to get 32 marks in mathematics. The main causes of their less interest are due to their poor mathematical concept. It is said that the mathematics being poor in higher class of

school by the cause of carelessness in the basic class .The teacher focus more time of his teaching for problem solving. They emphasis deductive rather than inductive method .The weak student are not getting enough chance for their improvement. Therefore, mathematics learning seems to be harder in these days.

As a result, all students make negative concept for mathematics learning. In general, most of the schools promote students though they fail in mathematics and other one or two subjects. That is the main causes of high failure in SEE exam. Students get a great fear for passing SEE. They show irregular behaviors in exam to pass the subject.

In spite of that some student still great interest on mathematics. It is the subject for them to secure high score to get better division. If any effective method followed for teaching, we can attract their attention for mathematics .We can see several examples, where student fail in mathematics through they are much interested in it. One case for this failure in exam is also the lack of effective teaching. Most of the students fail in this subject after some implementation of new curriculum .The most of the failure students fail due to mathematics. In fact, the new curriculum and old unstrained teachers are responsible to the higher failure rate 2072 B.S. was the year of applying new curriculum, only 28% of student passed in mathematics from government schools. It was really the lowest pass percent in mathematics in SEE exam so far. We can conclude the fact that students' achievement in mathematics is very low in Nepal. Most of the students either fail or secure low score in SEE exam in this subject. The condition of SEE result is declining mostly in government schools than in private schools.

The process of learning depends not only of family factors but also of students personal characteristics that ware naturally correlated with family characteristics but

have an effect on their own. Therefore, in order to analyze achievement, some student's personal characteristics must be taken into account. Oloye (1989) further states that the socio-economic status of the parents affects students' academic performance. The health, diet, sleeps, natural and social contacts all have their influence upon the students' mental development. If they are properly nourished with balanced diets they will be healthy, their brain would develop properly and so they could have an excellent brainpower, which they need for good academic performance. Maternal relationship of the parent's socio-economic status of the family, authority pattern in the home, how warm or hostile the parents are all have their effect on the social learning and psychological experience of the child at home and at school. Parents who are restrictive to have children those are submissive and dependent. Furthermore, children from broken homes and unstable marriage relations perform poorly in school. Income refers to wages, salaries, profits, rents, and any flow of earnings received. Income can also come in the form of unemployment or workers compensation, social security, pensions, interests or dividends, royalties, trusts, alimony, or other governmental, public, or family financial assistance. Income can be looked at in two terms, relative and absolute. Absolute income, as theorized by economist John Maynard Keynes, is the relationship in which as income increases, so will consumption, but not at the same rate. Relative income dictates a person or family's savings and consumption based on the family's income in relation to others. Income is a commonly used measure of SES because it is relatively easy to figure for most individuals.

Occupational prestige as one component of SES encompasses both income and educational attainment. Occupational status reflects the educational attainment required to obtain the job and income levels that vary with different jobs and within

ranks of occupations. Additionally, it shows achievement in skills required for the job.

Occupational status measures social position by describing job characteristics, decision making ability and control, and psychological demands on the job.

Occupation is the most difficult factor to measure because so many exist, and there are so many competing scales. Many scales rank occupations based on the level of skill involved, from unskilled to skilled manual labor to professional, or use a combined measure using the education level needed and income involved.

Education plays a major role in skill sets for acquiring jobs, as well as specific qualities that stratify people with higher SES from lower SES. Annette Lareau speaks on the idea of concerted cultivation, where middle class parents take an active role in their children's education and development by using controlled organized activities and fostering a sense of entitlement through encouraged discussion. Lareau argues that families with lower income do not participate in this movement, causing their children to have a sense of constraint. A division in education attainment is thus born out of these two differences in child rearing. Lower income families can have children who do not succeed to the levels of the middle income children, who can have a greater sense of entitlement, be more argumentative, or be better prepared for adult life.

Wealth, a set of economic reserves or assets, presents a source of security providing a measure of a household's ability to meet emergencies, absorb economic shocks, or provide the means to live comfortably. Wealth reflects intergenerational transitions as well as accumulation of income and savings. Income, age, marital status, family size, religion, occupation, and education are all predictors for wealth attainment. There exists a racial wealth gap due in part to income disparities and differences in achievement. According to Thomas Shapiro, differences in savings (due

to different rates of incomes), inheritance factors, and discrimination in the housing market lead to the racial wealth gap. Additionally, rates of inheritance dramatically differ between African Americans and whites. The amount a person inherits, either during a lifetime or after death, can create different starting points between two different individuals or families. These different starting points also factor into housing, education, and employment discrimination.

UNESCO, (1991) in an article entitled “Parent learning support system”. State that “The foremost responsibility of the parents is to being further children that are asserted to the family, to the community and to the wider societies, the country, children, guardian and the residents of the community. The children belong equally grow capable of productive and beneficial participation in the varied process which take place in their immediate as well as extended environment i.e. in the social, economic, cultural and other process of disenable human values”.

CERIED (1985), in the report “Instructional improvement in primary school” has mentioned, “The quality of education that a study receives depends not only up on the relevance and appropriateness of the curriculum, text books and school activities but also affected by altitude and behavior of his parents towards his education”.

### **Statement of the Problem**

Records show that the less achievement of students in mathematics at school level. There are several factors such as home environment, physical instrument, policies, social and cultural background etc. that are responsible for the achievement in mathematics at secondary level among those factors socio-economic status of family is an important factor that may affect the achievement of the students. Socioeconomic status of family affects their student’s performance in the

subject. In looking more closely at why a remarkable number of students may be struggling for improvement in mathematics in comparison to other subjects, it is timely to consider, the SES factor. In society all that educational outcomes of children vary with the socio-economic background of their parents know it. Home is the first school of children. Home environment at influences a child's school education with his/her aspirations towards a good citizen for the future. Thus, to study the children's achievement in a particular subject, it is very much important to investigate their family background or in other words 'socio-economic status' of their family (Das & Sinah, 2017).

This research has analyzed mathematics achievement based on socio-economic related variables such as parents education, parents occupation, family size and family income. This study has mainly concerned with effect of socio-economic status on mathematics achievement at secondary level. In the present study, the effect of socio-economic status on performance in mathematics of secondary level students has been investigated. The question how a socio-economic status influences mathematic achievement is the vital question of the research. This study sought to answer the following research questions.

- How socio-economic status influences the achievement in mathematics at secondary level?
- What is the correlation between socio-economic status and student's achievement in mathematics?

### **Objectives of the Study**

The general objective of the study is to find out the effects of socio-economic status on performance in mathematics. The specific objectives of the study are given below:

- To find the influence of different socio-economic status in the mathematics achievement of students.
- To find the correlation between socio-economic status and students achievement in mathematics.

### **Significance of the Study**

Nepal is multiethnic, multi-lingual and multicultural country. So, many traditional fundamental processes of mathematical concepts is used in many different cultural groups. Beside these, it is necessary to know that Mathematics is an essential part of school curriculum. Therefore, every student should study it and gain better achievement. It has been taught for all pupils as a compulsory subject at school level. Therefore, every student needs the fundamental knowledge of Mathematics to solve his/her daily life problems. Several factors influence on Mathematics achievements. Socio-economic status is important factor that may effects on Mathematics achievement. The significances of this study are listed below:

- This study would provide the information about the socio-economic status of secondary level student.
- This study would providing information to the teacher about the achievement level of secondary level student who come from different socio –economic status.



- This study helps the people who teach the secondary level student having different socio-economic status.
- This study was help to the mathematics curriculum designer to designed better curriculum according to student different socio-economic stats.
- This study would helpful for further researcher.

### **Research Hypothesis**

There is positive impact of socio-economic status in mathematics achievement. The mathematic achievement of students was found to be strongly associate with parent's education and other factors were low associate. The family education is found to be highly significant in the mathematics achievement in boys where as family size in girls.

### **Delimitation of the Study**

Not all study is free from limitation. Therefore, every study has its own limitation due to limit resources, time and physical aspects. So this study has the following delimitation.

- This study was conducted among the student of secondary level of public schools of Banke, district.
- This study included in compulsory mathematics in grade ix of public school of Banke.
- Only 120 students of 6 public schools of Banke district was selected for the study.

**Definition of Related Term**

**Achievement:** Achievement in this study is defined in terms of mathematics scores

**Educated people:** In this category, those people are included who have passed at least SEE.

**Family income:** This variable also has been included in this study. A value of 1 has been coded to those children whose family income is low, 2 for middle income, and 3 for those whose family income was high.

**Family size:** This variable also has been included in this study. A value of 1 has been coded for those students whose family is small, 2 for middle, and 3 for large.

**Illiterate people:** In this category, those people are included who are unable to read and write.

**Large size:**It has been considered as the number of member in family greater than 8.

**Literate people:** In this category, those people are include who are able to read and write, also acquiring school education below SEE.

**Middle size:** It has been considered as the number of member s less than or equal to five in family.

Obtain by the students in the achievement test constructed by the researcher.

**Parent's education:** Considering the perceived importance of parents is educational status, this variable has been included in this study. A value of 1 has been assigned on illiterate, 2 for literate, and 3 for educated.

**Parent's occupation:** This variable also has been included in this study. A value 1 has been assigned for the parents who engaged in agriculture, 2 for business parents, and 3 for those whose parents were in job.

**Small size:** It has been considered as the number of member between 5-8 a family.

**Socio –economic status:** Socio –economic status of secondary level students have been taken as a composition of different variable.

- Parental educational
- Family size
- Parents occupation
- Family income

## **Chapter II**

### **REVIEW OF RELATED LITERATURE**

This chapter attempts to review the research studies and literature in the domain of mathematics achievement with special references. Extensive literature review provides knowledge gap in the prior studies and guideline for the further study of task. The purpose of review of literature is to study open the text and background of the study. So many books, reports and related studies have been reviewed in order to explain the present problem of the study. It helps to conduct the research programs and give the better ideas for the research to formulate research hypothesis. To conduct this research some studies reviewed by the researcher about trained teacher on mathematics achievement. In this study, review has divided in to two parts: empirical literatures and theoretical literature. They are as follows:

#### **Review of the Empirical Literature**

The literature review helps the researcher to know the works carried out in the area of his research project. It helps to make concept clear for the study and also directed to analyze and interpret the data. The main purpose of view of related literature is to find out what work have been done and what has not been done in the area of study being under taken . The related studies provide the researcher rational for the finding. It helps to conduct the new research in a systematic manner by providing the general outline of the research study and avoid the necessary duplication. There are several studies undertaken towards the comparative study of mathematics. Some of them are finding the impact in mathematics achievement by various independent variables, one of them is social-economics status.

Adhikari (2001) conducted a research on “A comparative study of achievement in mathematics of primary level students related to parents income” including eighty nine students of grade v and their parents of NirmalpokhariVDC of kaski district by using purposive sampling. The finding of this study showed that the mathematical achievement of high-income group is higher than middle income and low-income group student .But the mathematical achievement of middle group was not found significantly higher than low-income students were. He found that mathematical achievement of grade 5 students was affected by their parent’s income. Similarly, Tharu (2004) conducted a study entitled “Impact of socio –economic status on mathematical achievement” including 140 students (79 boys and 61 girls) of grade ten student of the selected four secondary school in Bardiya district. He was studied using achievement test paper to find the achievement of different socio-economic status student. He also collected all information about socio–economic status by using questionnaire tools for students as well as their parents. From this study, he found that mathematical. Achievements of students were found to be strongly associated with the socio –economic status of the children. Those students were achieved good marks in mathematics that come from the good socio–economic status and the students achieved low marks that have poor socio –economic status. Similarly, the boy’s mathematical achievement was found to be strongly associated with parents’ education, parent’s occupation, parent’s income than of girls and he also found that family income had negative effect on mathematical achievement of boy where as it had mild positive effect on mathematical achievement of girls.

A study carried by Sah (2000) conducted a study entitled “A comparative study of achievement in mathematics of lower secondary level students of different

ethnic groups.” Main objective of the study was to find the achievement difference of different ethnic group in Saptari district. The study was of descriptive survey type and achievement test paper was used as the tool. 150 students including Brahmin, Shah and Chaudhary of grade eight from different public schools in Saptari were selected as the sample. The content validity of the test was checked and approved by the mathematics educators of central department of education and mathematics teachers. Several descriptive statistical devices and inferential devices were used to analysis and interpreted the collected data. He concluded that the achievements of Brahmin students were higher than Shah and Chaudhary students and Shah Student’s achievement were higher than Chaudhary students were.

An article carried by Third International Mathematics and science study (TIMSS) measure socio-economic status in two ways: parent’s education level, and family wealth, as defined by a scale derived from survey questions about possessions in the home (e.g. number of books, computer, video camera, etc). Students from wealthier families were expected to have more of these items in their home. The TIMSS program is important for two reasons: firstly, it demonstrates a significant positive relationship between learning in mathematics and science and both socio-economic factors; second, it provides insights into relatively simple and unobtrusive measures of socio-economic status. In the most recent iteration of TIMSS (2002-03), for a year 8 students achievement in both mathematics and science was found to be higher for those whose parents had completed a university degree. Students who used a computer both at home and at school achieved a significantly higher science score than those who only used a computer at school (Thompson and Fleming, 2003).

A study carried by Bajracharya (2007) has conducted a study on the topic “determinants of the achievement status of grade eight students in mathematics”.

Main objective of the study was to assess achievement level of grade eight students in mathematics. Achievement test, interview forms and survey forms were used as the tools to collect data. 860 students were selected from 43 schools of Kathmandu district. The collected data were analyzed using different statistical tools such as Mean, Standard Deviation, Correlation and Multiple Regression. She has concluded that the student's achievement was directly related to the different variables of socio-economic status.

Similarly, Joshi (2009) conducted a study on topic. "Impact of socio - economic status on mathematics achievement" (A study of Muslim community). Include 142 students (96boys and 46 girls)of grade IX students of selected six secondary school in Nepalgunj, Banke and he found that those student achieve low marks that have poor socio –economic status and achieve good marks that have strong socio – economic status.

A study carried by Pandey (2013) conducted a study on the topic "Relationship of socio-economic status on mathematics achievement of primary schools students". Main objective of the study was to find the relation between socio-economic status and mathematics achievement of primary level students in Arghankhachi district. Achievement test paper was used as the tool to collect data. 113 students were selected from six schools of Arghankhachi district including 61 boys and 52 girls'. The collected data were analyzed using different statistical tools such as Mean, Standard Deviation, Correlation and Multiple Regression. He concludes that the student's achievement was directly related to their socio-economic status.

A study carried by Neupane (2006) did a study entitled "Effect of socio – economic status on mathematics achievement". For this, he included 84 students in

which 42 were boys and 42 were girls from Dura and Gurung community from five public school of lumjung district. In his study he found that mathematical achievement of student is positively correlated with parents' education .But the parents' occupation ,family size and structure of family are negatively correlated with mathematical achievement of boys is higher than girls and mean score of Dura students is higher than that of Gurung students .

An article carried by Khan, Iqban &Tasneem (2015), did research entitled with 'The influence of parents Educational level on Secondary School Students Achievement in District Rajanpur' which was conduct to focus the influence and impact of parents educational level on students' academic achievement at secondary level of education. The study utilizes the student result of the 9<sup>th</sup> class in secondary school certificate examination taken by the board of intermediated & secondary education Dera Ghazi Khan .Oral interview, observation and a questionnaire were used for the study. This article tries to find out the impact of parental education status at student academic achievement of secondary level. Research population was the student different public and private high schools of district Rajanpur, South panjap. 200 students of Grade 10 were taken as a sample randomly. Null hypothesis was formulate and tested using independent Z-test analysis. Descriptive study based on empirical data was tested to correlate the described variables. After analysis of the data the research finds significant positive relation between parent's education level and academic achievement of students.

Anstudy carried by Mishra (2017) carried out research entitle "Factors affecting achievement in mathematics at secondary level". He focused on the affecting factors in mathematic achievement at secondary level. He concludes the major factors which are affecting in learning mathematics at secondary level are



educational policies, educational system, educational environment, physical availability at school, poor trained teacher in mathematics, traditional curriculum, paper and pencil test, family background, poor management and interest of learner, text books, teacher competency, peer group and time schedule etc.

Similarly, Sharma (2018) carried out a research entitle “Impact of family environment in mathematics learning”. The focus of the study is identify the major factors involved in the family environment that impact mathematics learning among Sardar student. The interpretation has based on the qualitative data taken from interview with students, parents and teachers. He concludes that the family environment is the most important factor that affects mathematic learning of Sardar Children.

Whatever the research carried out in different field, the student’s achievement in any discipline would effect by various internal and external factors. One of the monetary factor “socio-economic statuses” would be the major factor especially in developing country like Nepal. The socio-economic status depends upon parent’s occupation, education family size and structure of family. Thus the researcher conducted the study of student’s achievement in mathematics on the basis of their socio-economic status.

## **Theoretical Literature**

### **Constructivism**

The term ‘Constructivism’ refers to the idea that learners construct knowledge for themselves--each learner individually (and socially) constructs meaning--as he or she learns. Learning is social activity as well as contextual process. Learning is intimately associated with our connection with other human beings, our teachers, our

peers, our family as well as casual acquaintances, including the people before us or next to us at the exhibit. We are more likely to be successful in our efforts to educate if we recognize this principle rather than try to avoid it. Much of traditional education, as Dewey pointed out, is directed towards isolating the learner from all social interaction, and towards seeing education as a one-on-one relationship between the learner and the objective material to be learned. In contrast, progressive education (to continue to use Dewey's formulation) recognizes the social aspect of learning and uses conversation, interaction with others, and the application of knowledge as an integral aspect of learning. Context is equally significant aspect of learning. We do not learn isolated facts and theories in some abstract ethereal land of the mind separate from the rest of our lives but we learn in relationship to what else we know, what we believe, our prejudices and our fears. On reflection, it becomes clear that this point is actually a corollary of the idea that learning is active and social. We cannot divorce our learning from our lives. (Hein,1991).

Christie (2005), explains that fundamentally, constructivism says that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. Constructivism is learning theory. Learning is an active process. Knowledge is constructed from experience. Learning is a personal interpretation of the world. It involves collaboration between instructors, students and family or community members.

From a contemporary constructivist perspective of mathematics education, personal experiences and previously learned knowledge as well as skill are encouraged as components for understanding. Observation, hypothesis and conclusion are made tested and drawn within a social environment that allows sense to be made. Unreasonable or meaningless mathematical solution would be medical by cultural

knowledge, and skill acquired in class could be used in real context. Increased understanding should result from mathematical task being linked to personal student experiences, and from the incorporation of the linguistic and culturally of student's lives.

Constructivism views that knowledge is not about the world rather constitutive of the world. Knowledge is not fixed object, an individual through his /her own experience constructs it. Constructivist acknowledges that individual is active agent, they engaged in their own knowledge construction by integrating new information into a meaningful way. Constructivist argue that it is impractical for teachers to make all the current decision and dump the information to students without cling students in the decision process and accessing students ability to construct knowledge.

This approach to mathematic learning is argued to lead understanding of mathematics when applied to the physical, social and cultural experiences and development contexts of the learner whereas traditional mathematics use of highly structured worksheet, step wise rulers practice examples, and formulaic solution to word problems has been criticized for its poor survivals of understanding and application beyond the classroom. Condition of classroom that foster a constructivist approach involves the use of realistic problems and conditions and the use of multiple perspectives, active engagement, group participation, frequent interaction and feedback, contexts that connect learning to real world, and integration of assessment into instruction.

Social constructivism focuses much on learning through cooperative group learning. It emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding. It has specific assumption about reality, knowledge and learning. To understand and apply

models of instruction that are rooted in the perspective of social constructivist, it is important to know the premises that underlie them. Social constructivists believe that reality is constructed through human activity. Member of society together invent the properties of the world. For the social constructivist, reality cannot be discovered that; it does not exist prior to the social invention.

### Conceptual Framework

This study is related to the impact of socio-economic status on mathematics achievement at secondary level (grade IX) students of Banke district. It is assumed more collaboration of learning which is affected the mathematics achievement. Socio-economic status is the most important factor, which includes parents's education, parents's occupation, family size and family income. Researcher has done own research based on following conceptual framework.

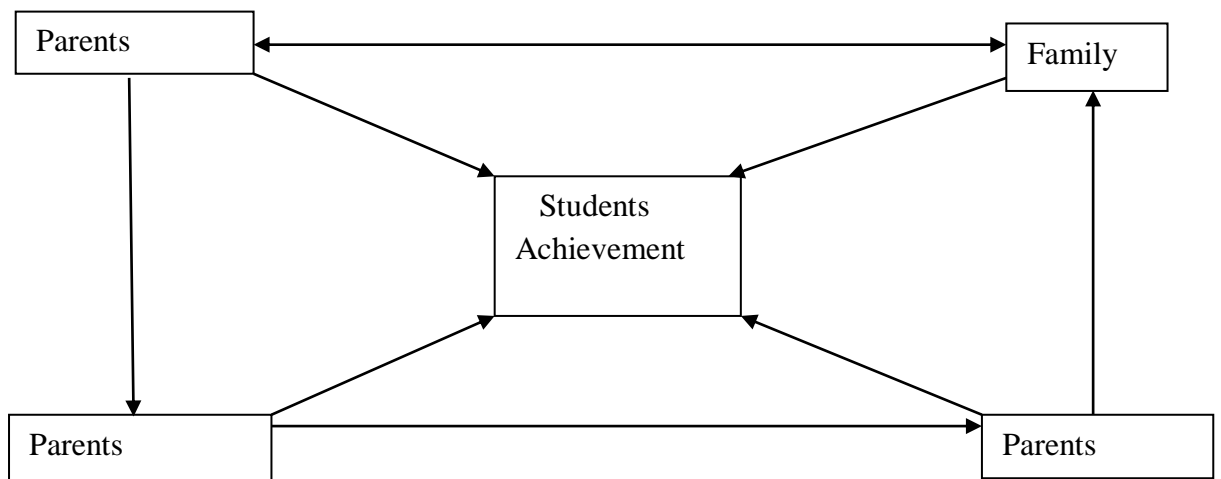


Fig.1 Conceptual Framework of the Study

SES variable is operationalized through the components parental education, parental occupation, family income and family size. The above framework illustrates that the roles of parent's education, parent's occupation, parents income and parents family size. This factors plays the main role in mathematics achievements at

secondary level students .This conceptual framework is related to students mathematics achievement .Researcher add these factors of socio –economics in learning achievements in mathematics students that helps or not. This is the focus area of my study. Hence, the researcher to find out the students mathematics achievement (dependent variable) from independent variable parents education, parent’s occupation, parent’s income and family size

## **Chapter III**

### **METHODS AND PROCEDURES**

This chapter describes the plan and procedure of the study, the separate heading that are carried to achieve objectives. In this chapter the population of the study, procedure for the selection of the sample, construction validation, reliability of the instrument, analytical design of the study, data collection procedure and data analysis and interpretation procedure are described and discussed.

This study focused on “effect of socio –economic status on mathematics achievement of secondary level student .All the independent variables are socio – economic status ,parent’s education ,parent’s occupation family size, parent’s income were in the study .clearly mathematics achievement was dependent variable and parents education ,parents occupation parents income and parents family size are independent variable of socio-economic status.

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

This is a survey study about the effect of socio –economic status of parents on their children’s mathematics achievement. This research has adopted survey design. .

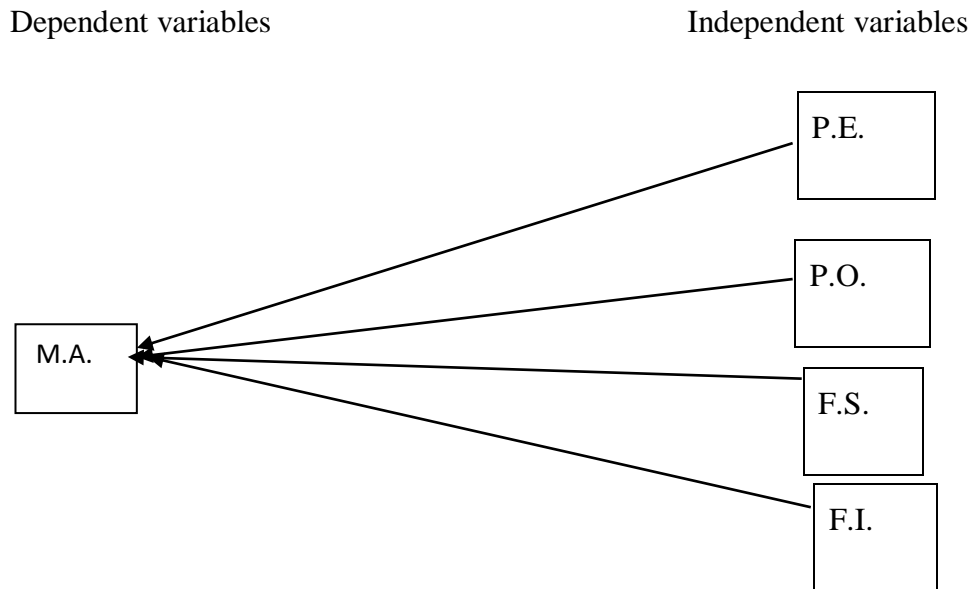


Fig. no. 2: Relationship between Dependent and Independent Variables.

The relationship of socio-economic characteristics to mathematics achievement could be shown as:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

Where, Y= Mathematics achievement

$X_1$ =Parent's educational status

$X_2$  = Parent's occupational status

$X_3$ =Family size

$X_4$ =Family income

$b_0$ =Intercept

$b_i$ 's=Least squares regression co-efficient

### Population of the Study

The population of the study was included the grade ix student of Bankey district. The researcher was collected data from Bankedistrict. In Banke district, there was 37 public secondary level school .The researcher was selected six school from 37

public school by the random sampling method .The researcher selected six public school was Shree Krishan Ma Vi Kaushilanagar, ShreeLaxmi Ma Vi Bardahawa, Shree Gyanpunjsagarmatha Ma Vi Kirankhola, Shree Tribhuvan Ma Vi kohalpur, Ram Ma Vi Hawaldarpur and Shree Jangyan joti Ma Vi Nawasta. Then the researcher selected the student in the ratio of student of these school of class ix. There was 1096 student are studies in the selected six public school at Banke district. The researcher was selected 120 student from the 1096 by the ratio of student of these school of grade ix

### Sample and Sampling Procedures

Sampling is a systematic process of selecting a number of individuals for a study to represent the larger group from which they are selected. Researcher select six public schools of Banke district using simple random sampling. After that all the students of grade ix of each school were 20 students selected using simple random sampling method.

**Table 1:Description of the Sample**

S.N	Name of school	No. of students		Total
		Boys	Girls	
1	Krishna Ma. Vi. Kaushilanagar	12	8	20
2	Jyanpunj Ma. Vikirannala	10	10	20
3	Jan jyanjoti Ma .Vi Kaushilanagar	11	9	20
4	Laxmi Ma Vi Bardawa	7	13	20
5	Tribhuvan Ma Vi Kohalpur	12	8	20
6	Ram Ma Vi Hawaldarpur	14	6	20
	Total	66	54	120



## **Data Collection Tools**

There were two instruments, one parents and another for the students. The instruments for parents were questionnaire to parents (See Appendix -i) and instrument for students was achievement test (See Appendix-iv).

### **Questionnaire**

The researcher himself with the help of experts and supervisor developed the questionnaire form. It was constructed after the detailed study of related literature such as articles, documents, thesis etc. The questionnaire form includes the parent's educational and occupational status, family size and the family income of the student's from different sources such as job, agriculture, business etc.

### **Achievement Test Paper**

The achievement test was administrated to 120 students in grade IX at the beginning of section to find out the achievement level of students. The time given for achievement test was one and half hour, one mark given for one right answer. For this study, the researcher constructed an achievement test paper with the help of prescribed curriculum and textbook of grade IX mathematics consisting, 50 multiple-choice items. Equal weight age was given for the entire chapter because of objectives. The items were selected from different areas of mathematics as Set, Arithmetic, algebra, Menstruation, Geometry, Trigonometry, Statistics and probability .There were 3(6%) items from sets, 12(24%) items from arithmetic, 8(16%) items from menstruation, 9(18%) items from algebra, 8(16%) items from geometry, 3(6%) items from trigonometry 4(8%) items from statistics and 3(6%) items from probability. Similarly it contained 15(30%)items from knowledge ,14(28%)items from comprehension, 8(16%) items from skills and 13(26%) items from application level

of cognitive domain .The test items covering different areas of mathematics and different level of cognitive domain are shows in the following tables.

**Table 2: Items Covering Areas of Mathematics and Level of Cognitive Domain**

S.N	Cognitive domain area	K	C	S	A	Total
1.	Sets	1	1			2(6%)
2.	Arithmetic	2	2		2	6(18%)
3.	Menstruation	2	1	1	1	5(16%)
4.	Algebra	2	1	3	2	8(24%)
5.	Geometry	2	2	1	1	6(18%)
6.	Trigonometry		1			1(3%)
7.	Statistics	1			2	3(9%)
8.	Probability	1	1			2(6%)
	Total	K	C	S	A	Total
		11(33%)	9(27%)	5(16%)	8(24%)	100%

### **Reliability and Validity of Tools**

Validity is a measure of how well a test measures what it is supposed to measure. The content validity of the questionnaire was established its approval from the mathematics education exports, school teacher and thesis supervisor. A reliable instrument is one that produces consistent result when used more than once in the process of data collection. Reliability test was done through test-retest method. For the reliability of the test the researcher carried out pilot test prepared in20 students grade ix students of shree Krishna ma vi school in Bankey were taken for pilot test. Before administering the test paper, the researcher instructed the student how to respond the test paper

Then to the reliability in of the test paper the score of 20 students of items analysis chart were identify by the letter in the first column of the table [See Appendix-iv].The score on the odd and even items of 50 items, in the second and third column of the table [See Appendix-iv].The reliability of the test was determined by using split-half calculation the reliability coefficient was found 0.284 [See Appendix –IV] also the reliability of the test was determined by using the items analysis of the score of 20 students [See Appendix-iv].

### **Item Analysis**

The difficult level and discrimination index of text was computed to check the quality of the text items. The item analysis was accomplished by administering 20 students of grade ix of Shree Krishna ma vi. school. The text items were score 1(one) for correct response and 0(zero) for incorrect response on each multiple choice items. Level of difficulty and power of discrimination of each items was calculated from 27percent i.e. 6 students of higher score, 27 percent i.e. 6 students of lower score and remaining i.e. 12 students medium score p-value and D-value of each items was calculated from the tabulated 27 percent of lower score of 20 students on the test in the given relation. Items number 2,4,7,9,16,19,24,28,29,31,33,37,41,42,46,49,50, were rejected and whose p-value or D-value do not lie between 0.04to 0.90 percent to above 90 percent cancelled. In this way items always analysis were accepted for the final from [See Appendix-iv].Hence the refined achievement test paper contain only 33 items [See Appendix –v].

### **Procedures of Data Collection**

The researcher was visited the sample school and the met the head teacher, mathematics teachers and students.Thenexplained in detail the purpose of the visit.

The sample of the study was 20 students from total student of class ix of this school. Total sample was divided in four groups according to parent's education, parent's occupation, family size, family income. Before administering the test, the researcher explains the answering procedure of test. The time allocated for complicating the test was 1 hour. After the time duration of examination the answer sheets were collected and score by the researcher. Then the researcher was visited the parents of simple students and distribution the questionnaire for the parents to respond the answer. The literate parents who could response questionnaire them self, they responded the questionnaire. The literate parents who could not them self the researcher obtain the information as directed interview method included questions related to parent's education, family occupation, family size and parent's income. Then the parents answer compare with achievement score of their students. From the above process researcher collected the raw data. It was ready for analysis.

### **Date Analysis Procedures**

The researcher analyzed the obtained data by calculating the mean, standard deviation, and correlation coefficient multiple Regressions were used for the analysis of the data. The mean was used to find the level of mathematics achievement of students and standard deviation to find the variability of mean. Correlation coefficient was used to determine the relation between the mathematics achievements and related independent variables. At last multiple regressions were used to find the effect of independent variables on dependent variable. The standard deviation was used to own ideas and intend but they are found and collected with long and rigorous study.

**Ethnical Consideration**

For the study, researcher has taken the data and information from the various sources, these sources are not only based upon his own ideas and intend but they are found and collected with long and rigorous study. So, researcher was give the sources or citations for these data and information by considering the ethical matters. He furthermore, was give both in text- citation and in references by thinking the matter of plagiarism. He is also very much sure that his study was not be barrier for anyone having its negative effects and pseudo impression to the stakeholders.

Regarding to the definitions, categories, quotations and other related information, he has not twisted or changed even a bit also by respecting the writers, scholars, philosophers and researchers. It is also one of the ways to get rid from the matter of academic year. Researcher has used pseudo name of the informants in the study.

## Chapter IV

### DATA ANALYSIS AND INTERPRETATION

This chapter deals the statistical analysis and interpretation of data obtained using achievement records and questionnaire. Different statistical tools such as Mean, Standard Deviation, Correlation Coefficient and Linear Regression were used. Student's questionnaire was used to analyze the collected data. This data were tabulated and analyzed using mean, standard deviation, correlation and Regression. The data obtained by above-mentioned tools were analyzed under the following heading

#### **Achievement of Students by Parent's Education**

Parent's education of the students has been categorized into three types illiterate, literate, and educated. Illiterate people are those people who are unable to read and write literate people are those people who are able to read and write, also acquiring school education below SLC, educated people are those people who have passed at least SLC. The mean and standard deviation of the score obtained by the students according to parent's education are tabulated below.

**Table 3: Mean and Standard Deviation of Mathematics Achievement of students by Parent's Education**

Group	No. of case	Percentage	Mean	S.D.
Educated	42	35	25.07	7.81
Literate	43	35.83	21.09	6.25
Illiterate	35	29.16	18.57	6.15

The finding recorded in the table 3 shows that the mean score of student of educated, literate and illiterate parents are 25.07, 21.09, 18.57 respectively .Therefore ,the mean score of educated parent’s children is higher than mean score of literate and illiterate. In addition, the mean score of literate parent’s children is higher than illiterate parent’s children. This concludes that Students of educated family have relatively good achievement in mathematics rather than literate and illiterate family.

Also the standard deviation of educated, literate, illiterate parent’s children is 7.81, 6.25, and 6.15 respectively. Therefore, there is more variability of mathematics achievement of educated parent’s children then the literate and illiterate parent’s children.

#### **Achievements of Students by Parent’s Occupation**

Parent’s occupation of students has been categorized into three types’ agriculture, business, and job. The mean and standard deviation of the score obtained by students according to parent’s occupation are tabulated below.

**Table 4: Mean and Standard Deviation of Mathematics Achievements by Parent’s Occupation**

Group	No. of case	Percentage	Mean	S.D.
Job	41	22.5	23.31	8.17
Business	37	18.33	21.70	6.91
Agriculture	41	59.16	20.24	6.32

The finding record in table 4 shows that most of the children parents are engaged the agriculture occupation .Also the table shows that the mean score of students of job, business, and agriculture are 23.31, 21.70 and 20.24 respectively. The mean score of job parent’s children is higher than the mean score of business and

agriculture parents' children. Also the mean score business parent's children is higher than the mean score agriculture parents children .Also the standard deviation of job , business, and agriculture occupation parents children are 8.17, 6.91 and 6.32 respectively. So it is conclude that there is more variability in the achievement of job occupation parents children then the agriculture and business occupation parents children.

### **Achievement of Students by Family Size**

Family size of the students has been categorized into three type's small, middle and large size. Family with members less or equal five is small, family with member greater than five and less or equal to eight is middle, and family with members greater than eight is large size. The mean and standard deviation of the score obtained by students according to the family size are tabulated below.

**Table 5:Mean and Standard Deviation of Mathematics Achievement by Family Size**

Group	No. of case	Percentage	Mean	S.D.
Small size	41	31.66	25.80	7.19
Middle size	43	41.66	20.23	6.53
Large size	36	26.66	18.57	6.20

The finding recorded table 5 shows that the mean score of students of small size, middle size and large size are 25.80, 20.23 and 18.57 respectively. The mean score of small size family children is higher than the score of large size and middle family size. The mean score of large is less than the mean score of middle size families' children. Also the standard deviation of small size, middle size and large size family's children are 7.91, 6.53 and 6.20 respectively. So it is conclude that there



is more variability in the achievement of small size family's children than the middle size and large size family's children.

### **Achievement of Student by Family Income**

Family income of the student has been categorized into three types low, medium, and high. Family with income less than or equal Rs.8000 per month is included in low income, family with income greater than Rs.8000 and less or equal to Rs.18000 per month is included in medium, and family with income greater than Rs.18000 per month is included in high income. The mean and standard deviation of the score obtained by students according to family income tabulated below.

**Table 6: Mean and Standard Deviation of Mathematics Achievement by Family Income**

Group	No of case	Percentage	Mean	S.D.
High income	40	19.16	23.27	7.17
Middle income	42	37.5	21.95	6.14
Low income	38	43.33	19.89	8.25

The finding recorded in table 6, shows that the mean score of students of high income, middle income and low income family are 23.27, 21.95 and 19.89 respectively. This shows that the mean score of high income family students is higher than mean score of middle income and low-income family. Also the standard deviation of high income, middle income and low income are 7.17, 6.14 and 8.25 respectively. So it concludes that there is more variability in the achievement of low income and middle income family's children than high income family's children.

### **Relation Between Explanatory Variables and Dependent Variables**

The mean and standard deviation of the explanatory variables along with their correlation with the dependent variables are presented in the following table.

**Table7: Correlation between Explanatory Variables and Dependent Variables**

S.N.	Explanatory variables	Correlation with depended variables
1.	Parents occupation	0.171
2.	Parents Education	0.508
3.	Family size	0.218
4.	Family income	0.273

The above table7 shows that mathematics achievement of students were found to be strongly associate with the parent's education whereas parent's occupation and family income had the low relationship. The correlation of parent's education is more than others. By the result, it was concluded that parent's education help to improve the children's mathematical achievement.

### **Relation of Socio-Economic Variables and Mathematic Achievement**

The inter-correlation of four socio-economic related variables and mathematic achievement represented in the flowing.

**Table8: Correlation of Socio-Economic Variables and Mathematics Achievement**

Variables	M.A.	F.E.	F.O.	F.S.	F.I.
M.A.	1	0.95	0.363	0.38	0.87
F.E.		1	0.508	0.11	-0.066
F.O.			1	0.171	-0.015
F.S.				1	0.11
F.I.					1

From above table 8, it was found that mathematical achievement was positively correlated with parent's education and low positive correlation with parent's occupation, family size and with family income. The variables parent's education was positively correlated with family occupation and with family size negatively correlated with family income. The variable parent's occupation is low positively correlated with family size and negatively correlation family income. And family size is negative correlated with family income. By the result it is concluded that parent's education help him to get a good job but cannot earn enough money.

### **Socio-Economic Related Variables and Mathematic Achievement**

Explanatory variables i.e. parent's Education, parent's Occupation, Family Size and Family Income and Dependent variable were used in the multiple linear regression model. The result of regression analysis and standardized regression coefficient B of explanatory variables are shown in the table below.

**Table 9:Regression Equation to all Students**

Explanatory variables	Co-efficient	Standard error	p-value
Family Education	4.357	0.915	0.000
Family Income	1.321	0.152	0.081
Family Size	1.79	0.539	0.073
Parents Occupation	-0.119	-0.14	0.634
	$R^2 = 0.348$		

In table 9, the  $R^2 = 0.348$  means 34.8% of students achievement were explained by the explanatory variables viz. family education, family size, family income and family occupation. The family education is found to be highly significant (p-value = 0.000) in the mathematics achievement.

The multiple regression equation for the boy's students is given in the following equation.

$$Y = 2.982 + 4.357X_1 + 1.321X_2 + 1.79X_3 - 0.119X_4 \dots\dots\dots (1)$$

From equation (1), it has been interpreted as one unit increase in family education increases the achievement by 4.357. Similarly, the one unit increase in family size increases the achievement by 1.321. One unit increase in family income increases the student achievement by 1.79. At last, the one unit increases in parent occupation decreases the student achievement by 0.119.

### Regression Mathematics Achievement by Sex

**Table10: Regression Equation for Boys and Girls**

Variables	Boys			Girls		
	Coefficient	Standard Error	p-value	Coefficient	Standard Error	p-value
Constant	2.982	4.257	0.487	6.927	3.562	0.056
Family Education	4.475	1.137	0.000	1.357	0.926	0.148
Family Size	1.253	1.054	0.240	4.795	0.941	0.000
Family Income	2.686	1.093	0.18	1.321	0.908	0.151
Parents Occupation	0.711	1.185	0.551	-0.119	0.881	0.893
	R <sup>2</sup> =0.364			R <sup>2</sup> =0.348		

In table 10, the boys R<sup>2</sup> = 0.364 means 36.4% of students achievement were explained by the explanatory variables viz. family education, family size, family income and family occupation. Similarly, the girls R<sup>2</sup> = 0.348 means 34.8% of

students achievement were explained by the explanatory variables viz. family education, family size, family income and family occupation. The family education is found to be highly significant (p-value = 0.000) in the mathematics achievement in boy whereas family size in girls (p-value = 0.000).

The multiple regression equation for the boy's students is given in the following equation.

$$Y = 2.982 + 4.475X_1 + 1.253X_2 + 2.686X_3 + 0.7011X_4 \quad \dots\dots\dots (2)$$

Achievement = 2.982 constant + 4.475family education + 1.253family size + 2.686family income + 0.711parents occupation

From equation (2), keeping other variables as zero or abrupt then mathematical achievement was 2.982. This implies that mathematical achievement was 2.982 due to other forgets.

It has been interpreted as one unit increase in family education increases the achievement by 4.475. Similarly, the one unit increase in family size increases the achievement by 1.253. One unit increase in family income increases the student achievement by 2.686. At last, the one unit increases in parent occupation increases the student achievement by 0.711.

In conclusion, variables  $x_1$ ,  $x_2$ ,  $x_3$  and  $x_4$  had found to be positive effect on mathematical achievement.

The multiple regression equation for the girl's students is

$$Y = 6.927 + 1.357X_1 + 4.795X_2 + 1.321X_3 - 0.119X_4 \quad \dots\dots\dots (3)$$

Achievement = 6.927constant + 1.357family education + 4.795family size + 1.321family income - 0.119parents' occupation

From equation (3), keeping other variables as zero or abrupt then mathematical achievement was 6.927. This implies that mathematical achievement was 6.927 due to other factors.

From equation (3) it has been interpreted as one unit increase in family education increases the achievement by 1.375. Similarly, the one unit increase in family size increases the achievement by 4.795. One unit increase in family income increases the student achievement by 1.321. At last, the one unit increase in parent occupation decreases the student achievement by 0.119.

In conclusion, variables  $x_1$ ,  $x_2$  and  $x_3$  had found to be positive effect on mathematical achievement, whereas  $x_4$  had negative effect on mathematical achievement.

## **Chapter V**

### **SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION**

This chapter presents the summary and conclusion of the study. Moreover, after the analysis and interpretation of collected data, an attempt has been made to some recommendations for the further work. The first section of this chapter presents summary of the research, the second section presents finding and the last section presents recommendations based on the finding of the study.

#### **Summary of the Study**

This study was concerned with the effect of socio-economic status in mathematics achievement at secondary level students. SES variable is operationalized through the components parental education, parental occupation, family income and family size. The main objectives of the study are to analyze the mathematics achievement of secondary level students with respect to different socio-economic status of family. Researcher developed the achievement test paper with the help of prescribed curriculum and the test book of mathematics of grade nine and conducted the test Shree Gyankunja secondary school, Rajhena, Banke for item analysis of the test and for checking its reliability and validity to standardized test. In addition, the researcher developed the questionnaire with the help of supervisor to know the socio-economic background of the student's family. This study was conducted among the student of nine classes of public schools of Banke district. For this study 120 students were chose from six public school of Banke, district.

After the collection of the necessary data, those data have analyzed and interpreted using statistical tools and technique. After analysis and interpretation of the data, following finding have found:

- There was highly significant difference in mathematics achievement of students according to their parent's three educational groups.
- The mean achievement score of the student of educated parent's was higher than literate parents and illiterate parents. Also, the mean achievement of score of literate parent's was higher than illiterate parent's.
- There was significant difference in mathematics achievement of students according to their parent's occupational groups.
- The mean achievement score of the student of jobholder parent's was higher than business parents and agriculture parents. And the mean achievement score of jobholder parent's students was higher than agriculture parent's students.
- There was significant difference in mathematics achievement of students according to their family size.
- The mean achievement score of the student of small family size was higher than middle family size and large family size. And the mean achievement score of middle family size student's was higher than large family size students.
- There was significant difference in mathematics achievement of students according to their family income.
- The mean achievement score of the student of high income family was higher than middle income family and low income family. Also the mean achievement score of middle income family's student's higher than low income family's students.
- The mean achievement score of the boys was higher than girls.



- Achievements of mathematics students were found to be positively associated with the parents' education, parents' occupations, parents' income and family size.
- Mathematical achievement was positively correlated with parents' education and low positive correlation with parents' occupation, family size and with family income. The variables parents' education was positively correlated with family occupation and negatively correlated family size and with family income. The variable parents' occupation low positively correlated with family size and negatively correlation family income. And family size is negative correlated with family income. By this result it is concluded that parents' education help him to get a good job but cannot earn enough money.
- Mathematics achievement was explained by four explanatory variables entered into the multiple regression equation Parents' Education status was found to be most strongly associated with mathematics achievement .Also Family Income and Family Size are low associated with mathematic achievement. Other socio-economic related variables Parent's Occupation had a negative effect on the mathematics achievement.
- Mathematics achievement was explained by four explanatory variables entered in to that multiple equation respectively. The variables parent's educations, family income, family size, were found to be most strongly associated with the mathematics achievement of boys and girls respectively. The variable parent's occupation was found to be positive influence on boy's mathematic achievement and family income was strongly negative influence on girl's mathematic achievement.

## **Conclusion**

The study intends to observe the effect of socio-economic status of parents on their children's performances in mathematics. The study attained at a conclusion in this respect that the socio-economic status of parents affects children's performances in mathematics. Observation of the components of socio-economic status of parents leads to state that the components such as parent's education, occupation and monthly family income also affect independently children's performance in mathematics. This study showed that the education level of parent's has significant effect on student's mathematics achievement. The highlighted that the mean achievement score of the student of the educated parent's was higher achievement score of literate parent's was lesser and illiterate parent's was least. Similarly, the parent's income, family size and parent's occupation was significant effect on their student's achievement in mathematics. The problem of low mathematics test scores at schools with a high number of students in low SES situations deserve more attention and policies, since it is clearly to effectively meet the needs of these students and live up to the opportunities promised by the education dream.

## **Recommendations for the Further Study**

After conducting this study, the researcher got some finding. On the basis of these finding, the researcher would like to suggest some recommendation for the improvement in mathematics achievement.

- The study of this kind should be conduct at all levels of school and in other subject as well.
- This study was limited to the students of grade ix from six public schools, hence the researcher cannot generalized the finding of this study to all grade

and the whole country. So similarly study should be done region wise as well as national wise in order to establish the finding of study.

- Promoting research and development effort for increasing mathematics achievement is the most.
- The study of these kinds should be conduct at all over the country and in other subject and ethnic group as well.

### **Recommendations for Education Implication**

- This study helps all students should in school for good mathematics achievement.
- This study helps all parents should be inspire their create good home environment.
- This study helps to parents for involving their children mathematic learning.
- This study helps to parents should be managed proper environment to their children for involving in mathematics learning, which helps enhanced mathematical achievement.
- This research could help the teacher, student and parents.

Appendix -I

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**Appendix -II**

**List of Sample School**

1. Jan Gyan Joti Ma. Vi, Kaushilanagar Banke.
2. Tribhuvan Ma. Vi. Kohalpur Banke.
3. Ram Ma. Vi. Hawaldarpur Banke.
4. Jayan Punj Sagarmatha Ma. V i Kiran Khola Banke.
5. Laxmi Ma. Vi. Bardawa Banke.
6. Krishna Ma. Vi. Kaushilanager Banke.

**Appendix –III****Raw Score of Sampled Students**

## 1. According to parent's education status

Educated	Literate	Illiterate
28,20,24,21,28,26,27,30,23	18,20,31,14,8,10,12,27	10,18,20,30,21,20,
24,15,21,17,10,23,16,18,22	21,31,21,30,12,11,9,16, 24	17,15,16,25,11,12,
29,21,13,17,25,18,10,31,23	20,22,14,15,25,26,17,18	22,31,32,19,28,28,
20,18,17	10,20,21,18,26,21,31,32	21,10,21,22,13,14,
	16,15,18,12,10,17,18,15,	17,9,12,18,27,22,
	20,18,14,15,11,20,30,20,	18,16,13,30,22,13,
	24	24,25,20,11

## 2. According to the parent's occupation

Job	Business	Agriculture
24,30,20,21,22,25,21,22,	10,12,17,23,22,25,11,12,	20,12,30,22,12,
24,27,20,31,18,28,31,17,	17,12,18,28,27,31,20,18,10,21,	18,17,23,17,32,
19,21,31,20,27,24,28,21,	12,22,23,24,17,10,17,12,18,17,	15,16,13,23,17,
16,15,23	12,24,13,15,17,21,25,27,23,20,	18,19,20,22,22,
	22,24,24,27,28,26,17,28,12,18,	11
	21,29,10,9,8,17,28,21,25,31,20,	
	21,30	

## 3. According to the family size

Small size	Middle size	Large size
14,18,28,25,10,25,30,23,	20,21,17,18,12,10,17,18,20,21,	27,18,21,19,30,21,
14,21,20,12,14,17,18,25,	31,12,22,21,17,27,25,23,20,11,14,15	19,16,15,17,

21,22,18,30,14,15,21,27, 21,22,32,31,12,14,22,11, 12,17,19,20	,21,27,28,21,31,18,19,20,31,13,23,1 0,19,17,21,17,31,14, 19,18,21,23,25,30,12,13,17,25,21,15 ,17,31,23	18,13,14,25,27,28, 29,18,29,23,21,22, 11,10,13,17
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According to the family Income

High Income	Middle Income	Low Income
17,20,30,18,20,21,18,19,29, 23,25,16,24,28,21,26,21,11, 12,13,14,15,21,22,23	12,18,21,23,27,16,12,21, 11,21,24,20,17,19,31,32, 31,24,13,14,31,30,11,18, 21,17,19,20,21,12,18,14, 15,10,11,21,23,31,32,17, 19,25,23,14,11,23,21,16, 15,20	10,20,21,17,18,29,21, 24,25,16,27,28,21,23, 11,12,14,15,12,20,13, 12,23,25,16,15,18,11, 12,13,21,25,23,20,20, 21,25,11,21,11,13,14,17

4. According to the sex of child

Boys	Girls
20,18,24, 14,18,30,25,10,25,30,35, 21,22,20,12,14,17,18,25, 21,22,18,30,14,15,21,27, 21,22,32,31,15,24,15,11,12,17,19,20 ,13,14,25,27,28,29,18,29,23,21,22, 11,10,13,17	20,21,17,18,12,10,17,18,20,21, 23,32,24,21,17,27,13,23,20,11,14,15,21,27,2 8,21,31,18,19,20,31,25,26,10,19,17,21,17,31 ,21, 19,18,21,23,25,30,12,13,17,25,21,15,17,31,2 3 ,27,18,21,24,30,21,19,16,15,17, 18

**Appendix-IV****Items Analysis Table**

1. Following the table shows marks obtained by students for even and odd question.

Students' Roll No.	Marks Obtained in Even Question	Marks Obtained in Even Question	Total Obtained Marks
1	11	14	25
2	11	9	20
3	08	9	17
4	9	14	23
5	10	14	24
6	08	11	19
7	12	8	20
8	12	14	26
9	8	14	22
10	13	10	23
11	12	10	22
12	11	13	24
13	9	10	19
14	10	17	27
15	9	14	23
16	9	14	23
17	9	14	23
18	8	13	21
19	14	13	25
20	13	14	27
	Total Obtained X=206	Total Obtained Y=249	



## 3. Split-half Reliability Calculation

	Students	Odd	Even	Sum	Difference
Upper 27%	1	10	17	27H	-7L
	2	14	13	27H	1H
	3	13	14	27H	-1
	4	12	14	26	-2
	5	11	14	25	-3L
	6	11	13	24	-2
Lower27%	7	8	13	21	-5L
	8	11	9	20	2H
	9	12	8	20	4H
	10	8	11	19L	-3
	11	9	10	19L	-1
	12	8	9	17L	-1

From the table, Sum of the three highest      81      7

Sum of three lowest      55      -15

Difference      Da= 26      Db=22

Difference of square      D2a=676      D2b=484

By formula, Reliability co-efficient (rtt) =  $1 - \frac{D2d}{D2a} = 1 - \frac{484}{676} = 0.284$

P and D value with respect to each items of mathematics achievement test.

Q.N.	UR	LR	P-value	D-value	Decision	Q.N	UR	LR	P-value	D-value	Decision
1	4	1	50	0.6	A	26	2	4	60	-0.4	R
2	3	3	60	0	R	27	5	2	70	0.6	A
3	5	2	70	0.6	A	28	4	1	50	0.6	A
4	4	2	60	0.4	A	29	5	1	60	0.8	A
5	2	3	50	-0.2	R	30	2	2	40	0	R
6	3	1	40	0.4	A	31	5	1	60	0.8	A
7	4	3	70	0.2	A	32	3	2	50	0.2	A
8	5	2	70	0.6	A	33	2	3	50	-0.2	R
9	2	4	60	-0.4	R	34	4	2	60	0.4	A
10	2	1	30	0.4	R	35	1	3	40	-0.4	R
11	4	2	60	0.2	A	36	5	2	70	0.6	A
12	3	2	50	0.2	A	37	4	1	50	0.6	A
13	4	1	50	0.6	A	38	3	3	60	0	R
14	2	2	40	0	R	39	4	0	40	0.8	A
15	5	4	90	0.2	R	40	5	1	60	0.8	A
16	3	1	40	0.4	A	41	3	0	30	0.6	A
17	4	0	40	0.8	A	42	4	1	50	0.6	A
18	3	4	70	-0.2	R	43	5	0	50	1	A
19	5	1	60	0.8	A	44	1	1	20	0	R
20	3	0	30	0.6	A	45	4	0	40	0.8	A
21	1	3	40	-0.4	R	46	4	1	50	0.6	A
22	2	0	20	0.4	R	47	3	1	40	0.4	A
23	4	1	50	0.6	A	48	5	0	50	0.1	A
24	5	2	70	0.6	A	49	2	0	20	0.4	R
25	4	4	80	0	R	50	4	1	50	0.6	A

Where:

UR: Upper Right Response

LR: Lower Right Response

P: Difficulty Index

A: Accepted

R:Rejected

**Appendix-V****Answer Key for Achievement Test**

Q. No.	Correct Answer	Q. No.	Correct Answer	Q. No.	Correct Answer	Q. No.	Correct Answer	Q. No.	Correct Answer
1	b	8		15		22		29	
2	a	9		16		23		30	
3		10		17		24		31	
4		11		18		25		32	
5		12		19		26		33	
6		13		20		27			
7		14		21		28			

**Appendix-VI**

j:t'ut k|Zgx?

slff M- (

k"Off{Î M-

ljifo M-

ljBfyL{sf]

gfd M-

/f]Ng M-

ljBfnosf] gfd

M-

!= #) hgf ljwfyL{ ePsf] slffdf !& hgfn] elnjn dg k/fp5g !% hgfn] af:s]6  
 an / !) hgfn] b'j} dg k/fp5g eg] s'g} klg dg gk/fpg] ljwfyL{  
 slt xfnfg <

a) 5

b) 8

c) 6

@= !#) hgf dl;df ul/Psf] ;f]{j}lf0fdf \*) hgfn] s[lif k]zf ckgfPsf 5g \*%  
 hflu/] k]zf ckgfPsf 5g . b'j} k]zf ckgfpg] slt xfnfg <

a) 55

b) 50

c) 45

#= olb ? !)-I.C.) a/fa/ ? !^(N.C.) ,! cd]l/sfg 8\n/ a/fa/ ? &)(N.C.) eP ?  
 &))- I.C.) af/a/ slt x'G5 <

a) 810

b) 816

c) 16

\$= !% j6f a:t'sf] d"no ? () k5{ eg] ? !%) df slt j6f a:t' kfO{G5g\ <

a) 100

b) 250

c) 300

%= ? @)) kg]{ s'g a:t'df !#% eof6 nufpbf slt /sd ltg'{ knf{ <

a) 226

b) 126

c) 26

^= ? !%) sf] !)% k|lt jif{ Jofhb/n] @ jif{df hDdf slt Jofh kfO{G5 <

a) 100

b) 300

c) 200

$\&= \text{olb nDafO l rf} \} 8fO \text{ b / prfO h 5 eg] rf/leQfsf] lf]qkmn lgsfNg] ;'q s'g xf] <$

a)  $2h(l+b)$

b)  $2(l+b)$

c)  $2(lb+bh+lh)$

$*= \text{cw}\{ \text{Jof; ePsf] O6fsf] lf]qkmn lgsfng] ;'q s] xf] <$

a)  $\frac{\pi r^2}{2}$

b)  $\pi r^2$

c)  $2\pi r$

$(= \text{Pp6f juf}\{ \text{sf/ e'Osf] lf]qkmn @})m^2 5 \text{ o;sf] e'Odf Knf:6/ ubf}\{ \text{k|lt ju}\{ \text{ld6/ ? \& sf b/n] slt vr}\{ \text{nfU5} <$

a) 1200

b) 600

c) 30

$!)= \text{Pp6f O6fsf] Jof; !\$ cm5 eg] o;sf] kl/lw slt xf]nf <$

a) 40 cm

b) 44 cm

c) 88 cm

$!!= a^3 + b^3 \text{ sf] u'Ofg v08x? tnsf dWo s'g xf]nf <$

a)  $(a+b)(a^2+ab+b^2)$

b)  $(a-b)(a^2+ab+b^2)$

c)  $(a+b)(a^2-ab+b^2)$

$!@= \frac{a^m}{a^n} \text{ sf] ;/n ?k tnsf dWo] s'g xf] <$

a)  $a^{m-n}$

b)  $a^{m+n}$

c)  $a^{m \times n}$

$!#= \text{olb } \frac{2}{4} = \frac{x}{40} \text{ eP x sf] dfg slt xf]nf <$

a) 20

b) 10

c) 30

$!\$= x^2+5x+6 \text{ sf] u'Ofg v08x? tnsf dWo] s'g xf] <$

a)  $(x-2)(x+3)$

b)  $(x+2)(x+3)$

c)  $(x-2)(x-3)$

$!%= \sqrt[2]{27} \text{ a/fa/ slt x'G5} <$

a) 3

b) 4

c) 2

$!^= (x^{a+b})a - b \times (x^{b+c})b - c \times ((x^{c+a})c - a \text{ sf] dfg slt slt xf]nf <$

a) 2

b)  $a^2 - b^2$

c) 1

$$!&= a^2 + b^2 \text{ sf] ;'q s] x'G5 <$$

a)  $(a-b)(a+b)$

b)  $(a+b)^2 - 2ab$

c)  $(a+b)^2 + 2ab$

$$!* = x \text{ sf] dfg slt xf]nf < } \frac{x}{3} + \frac{2}{4} = \frac{7}{3}$$

a) 7.3

b) 4

c) 6.1

$$!( = \frac{\sqrt{512x^7y^5z^3}}{\sqrt{2x^3yz^{-1}}} \text{ sf] dfg slt x'G5 < s}$$

a)  $4x^2y^2z^2$

b)  $4x^2yz$

c)  $4xyz^2$

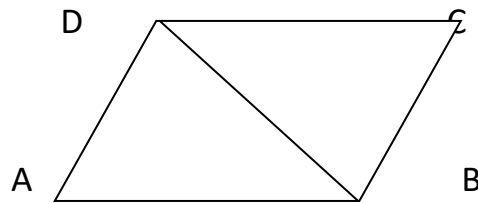
$$@) = 2\frac{x}{3} = 3 \text{ eP x sf] dfg slt xf]nf <}$$

a) 1

b) 2

c) 3

$$@! = \text{olb } \triangle ABC \text{ sf] lf]qkmn } 30\text{cm}^2 \text{ eP } \square \text{ sf] lf]qkmn slt xf]nf <}$$



a)  $30\text{cm}^2$

b)  $60\text{cm}^2$

c)  $40\text{cm}^2$

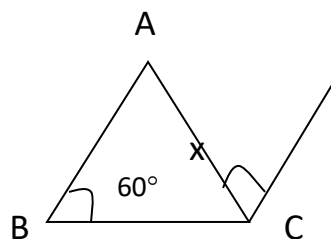
$$@@ = ;\text{dafx' lqe'hsf] lf]qkmn lgsfNg] ;'q s] xf] <}$$

a)  $\sqrt{\frac{3a^2}{2}}$

b)  $\sqrt{\frac{3a^2}{2}}$

c)  $\frac{2}{\sqrt{3}}a^2$

$$@\# = \text{lbPsf] lrqdf x sf] dfg slt xf]nf <}$$



a)  $60^\circ$

b)  $40^\circ$

c) 50

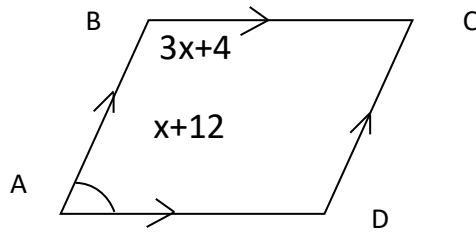
@\$= ;dafx' lqe'hsf k|Tos sf]0f slt slt l8lu|sf xf]nfg <

a) 58

b) 40°

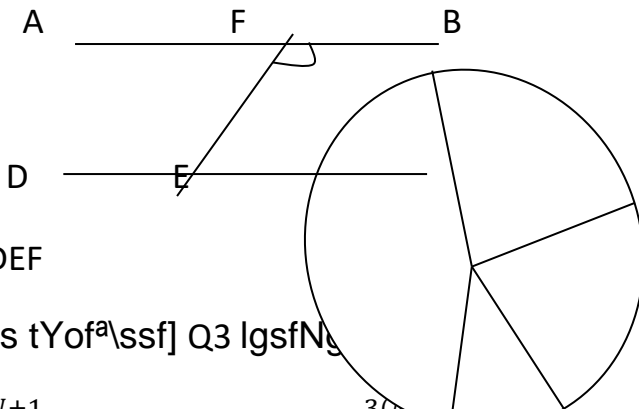
c) 60°

@%= x sf] dfg lgsfn .



- a) 2                                      b) 8                                      c) 4

@^= lbPsf] lrq af6 ;+ut sf]Of lgsfn .



- a)  $\angle DEF$                                       c) AFC

@&= j}olQms tYof^ss] Q3 lgsfn

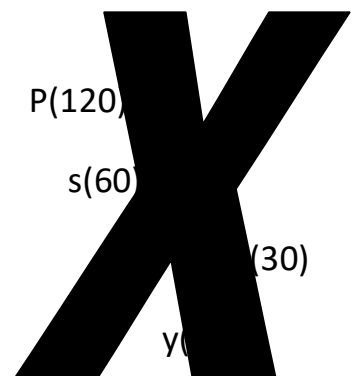
- a)  $\frac{N+1}{4}cf\}kb$                                       b)  $\frac{3(N+1)}{4}cf\}kb$                                       c)  $\frac{3+1}{4}cf\}kb$

@\*= tnsf] tYof^ss] dWos @^ eP a sf] dfg lgsfn <

13      19      24      a      29      33      37

- a) 27                                      b) 26                                      c) 24

@(= lbOPsf] kfOrf6{af6 p sf] k|ltzt lgsfn <



- a) 33.33%                                      b) 31%                                      c) 40%



$$\#) = \cos 60^\circ \text{ s] dfg slt xf]nf} <$$

$$a) \frac{1}{2}$$

$$b) \frac{3}{2}$$

$$c) \frac{1}{5}$$

$$\#! = \text{cfOtfaf/ g} \} \text{kfgL kg}\{ ; \text{fDefjotf slt xf]nf} <$$

$$a) \frac{1}{2}$$

$$b) \frac{1}{7}$$

$$c) \frac{3}{7}$$

$$\#@ = \text{Pp6f 8fO;nfO pkmf}\{ \text{bf ?7 ;+Vof kg}\{ ; \text{DefJotf slt xf]nf} <$$

$$a) \frac{1}{2}$$

$$b) \frac{3}{5}$$

$$c) \frac{2}{3}$$

$$\#\# = \text{tnsf dWo d"n wg lgsfNg] ;'q s'g xf] <$$

$$a) \frac{I \times 100}{I \times 100}$$

$$b) \frac{I \times 100}{P \times R}$$

$$c) \frac{I \times 100}{T \times R}$$

**Appendix-VII****Answer Key**

Q.N o.	Corre ct Answ er	Q.N o	Corre ct Answ er	Q.N o	Corre ct Answ er	Q.N o	Corre ct Answ er	Q.N o	Corre ct Answ er
1.	b	8.	a	15.	b	22.	b	29.	a
2.	a	9.	a	16.	a	23.	a	30.	a
3.	c	10.	b	17.	c	24.	b	31.	b
4.	b	11.	b	18.	b	25.	a	32.	c
5.	c	12.	c	19.	b	26.	c	33.	b
6.	a	13.	a	20.	a	27.	c		
7.	b	14.	a	21.	c	28.	d		

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