

## Chapter – I

### INTRODUCTION

#### Background of the Study

Education helps to develop human potentialities. The individual's capacities, potentialities, skills and behavior could be flourished through the better education. Classroom is the best place where the teacher is main actor for quality education. Education has been regarded as one of the most important factor for human development. The equality in education, which could enhance the productivity of the people, could also be beneficial for national development. Providing quality education to all citizens is thus, the prime responsibility of the government. Realizing this fact, the Government of Nepal has initiated various policies programmers and interventions in education.

Participation means involvement of people in many activities for certain purposes. Student Involvement creates and models inclusive environment where students find opportunities for personal and professional development. We integrate in class and out of class learning to provide positive experiences through programs, services and events.. Mathematics is a technical subject which needs more time to practice and high attention to learn but by nature such qualities are found in very few girls. In context of our country, girls are not encouraged for study by their parents and society. Less number of girls gets chance to involve in Math education comparatively.

There are some causes of less participation of girls in mathematics. Mathematics need much time to practice but almost girls don't get enough time to practice it. They have to look after their household work. Most of the girls don't get opportunities of higher study with subjects relating to math, girls are not interested in

math. They only try to pass SLC. Girls continue their study with other easy subjects. So, participation of girls in mathematics at higher study is almost less.

In Nepal, men tend to be the owners of property and the decision makers in the families. Woman often stay at home, cleaning, cooking and caring for their children. Although these activities are essential for the well-being of the family, women are often not respected for their work. Many times, when woman venture out of the home to take part in other types of activities such as; going to school, owing business and participating in politics, they are often held back or discouraged. The participation of women is very low in economic, intellectual, social and political opportunity in the society. This position of girls in labor market is partly mirrored by their performance in educational system. The policy makers of education have been felt that the education up to the middle standard is not sufficient for the citizens.

One of the biggest problems in Nepal's education system is female education. This issue has been neglected since beginning of 1950's. In fact, there is an extreme inequality in the literacy rate between men and women. In Nepal, 71 percent of men are literacy where as the literacy percent of women is only 44 percent (Giri, 2016). This is a staggering inequality for women's education which directly linked to the area of poverty in Nepal. Another issue of women's education is that the parents do not have enough money to ensure their children have to access the proper education. The issue of poverty is playing main role in Nepal's educational system.

The SLC was first introduced in 199 B.S. in Nepal. Thirty-three male and only one female participated in the first SLC examination. Education policy 2028 B.S. gave different education programs for the women education such as primary teacher training for eight classes passed female students hostels for girls in 2044 B.S. provision for women scholarship, school dress and informal education. In 2049 B.S.

Female Education Department was established for provision of women scholarship, development of quality education, minimum one female teacher in every primary school, monitoring of the program , publicity programs, for female education were made. There were different activities and policies adopted for the development of female education in Nepal these days. But female have lower literacy rate than male .The literacy rate in different 5 years of Nepal are given in the following table-1

**Table 1: The Literacy Rate of Nepal in Different Years**

Date[B.S]	Male	Female	Total
2028	23.6	3.9	14.0
2038	34.0	12.3	23.3
2048	54.5	25.0	39.6
2058	65.1	42.5	53.7
2068	75.1	57.9	65.9

Source: (Baniya, 2012)

The above table shows that the female Literacy rate increased rapidly after 2048 B.S. But couldn't meet the national objective. Nepal has one of the lowest Literacy rate in the world. The involvement of women in technical and vocational educations is also lower than men. The Literacy rate of women varies in rural and urban areas of Nepal. The rural Literacy rate of female is 36.5% and the urban rate is 61.5%. The low rate of female education is due to many reasons. First, Women are treated as second class citizens in the society and they are supposed to be home keepers. Their main duties are to serve home and male members in the family. So their achievement in any field of education is very low. (Mahato, 2016)

Most of the girls students at secondary level do not like to select mathematics as major subject due to the possibility of failure in examination. Girls' dislike to this subject has become a great problem to educationists and stake holders. There is now an equity theory that both male and female should have chance of getting education as social importance. When girls are distracted from mathematics, it is certain that women could not get the position of scientist and the domains of works which, by tradition, is considered as male domain. The students in general and girls' students in particular, have negative attitude towards this subject but the factors that are responsible for creating negative.

In our traditional society, cultural restrictions for the education of women confine them to the domestic and limit their participation in educational activities. The low rate of girls participation in mathematics Education have long term effect on the field of Education .So it is necessary to find the participation of girls in the field of Education as well as mathematics Education. Therefore, it was very important to undertake a research on this topic.

### **Statement of the Problem**

This study is inborn from my experience from secondary level to master degree in mathematics classroom. It was experience from the secondary level that only five girl students out of 40 students were participate in optional mathematics class. Similarly in college level there is negligible number of girls in mathematics classroom as compare to boys. So Iam very interested to found the participation of girls in mathematics.

This study was mainly concerned with the participation of girls in mathematics of Gorkha district. Lower achievement and participation of girls in

mathematics education is reflection of their position in society, poverty, social aspects and school related factors which are common across cultures. For instance, in a certain culture, a girl's chance of going to school may be directly dependent upon the availability of separate school facilities for girls and the presence of female teacher. Participation of girls in mathematics, science and all of field of technology is extremely low. So it is necessary to understand how to increase participation of girls in mathematics. This study will sought to answer the following research questions:

- What is the level of participation of girl students in mathematics?
- Does the school relate factor is responsible for the low participation of girls in mathematics at secondary level?
- Does the school environment factor affect the participation of girls in mathematics?
- Does the home environmental factor affect the participation of girls in mathematics?

### **Objectives of the Study**

The following objectives were designed for the research study:

- To find out the participation of girl's in mathematics at secondary level.
- To suggest the possible remedies to increase girls participation in mathematics at secondary level.

### **Significance of the Study**

Literacy rate of Nepal is very low in comparison to other country. Thus the study is significant for the reason that the result of this study would help to identify some of the factors that can affect the participation of girl's in mathematics at

secondary level. In due course, this is trying to increase the girl's participation in the field of mathematics. Hence the study has following significance:

- The study would help to identify the girl's participation of secondary level mathematics.
- It supports to found the information about the participation of girls in mathematics.
- The study would helps to manage more appropriate strategy for better achievement in mathematics.
- This study would also open the door for the further study about the problem in mathematics learning of girl's student.
- It would help to develop effective mathematical instructional planning for girl's student.

### **Delimitation of the Study**

Each study is not rigorous, perfect and free from limitation. All studies have some short of limitation and on the other hand they can overcome the problems of every field. This study also has some limitation which is pointed as below. Thus this study has following limitation:

- This study was limited to Gorkha district.
- This study included only girl's students of grade IX and result of this study is implacable to secondary level students especially to girls students only.
- This study was limited to only four secondary school from Gorkha district.

## **Definitions of Related Terms**

**Participation:** The term participation is defined as attending class regularly, interacting with teacher in class room, interacting with peers, doing homework and class works in the classroom.

**Achievement:** It was defined in terms of the score obtained by girl's students on the mathematical achievement test.

**Secondary Level:** Grade 9 and 10 in formal education.

**Public School:** The schools which are established and financed by Nepal Government, ministry of education.

**Private School:** The school which are registered as private limited company and owned managed and financed by private sector.

## **Chapter – II**

### **REVIEW OF RELATED LITERATURE**

Literature review is the process of locating, obtaining, reading and evaluating the research literature in the area of the search. It helps the researcher to know carried out in the area of his/her research project. The main purpose of review of related literature is to develop some temperature in one's area to see what new contribution can make and receive some idea for developing a research design.

#### **Review of Empirical literature**

Several types of related literature were received in this study which helps to make the concept clear for study and also directs to analyze and interpret data. Some related literature was reviewed as follows.

Acharya (2004) did the study on “Democracy, Gender Equality and Women's Literacy”. The topic of women's literacy in the midst of diverse value and practices, the analysis of the lived values and practices of ethnics and caste group of Nepal reflected immense diversity. Among diversity there are some commonalities as well which are Marriage is a social and cultural obligation and thus a compulsion, Child bearing is the most important part of married women's life is thus a compulsion. Child bearing especially giving birth to a son is linked to a women's security, respect and family dignity as the sons give continuity to the family lineage, and Sons alone are entitled to ancestral property.

Burdon (2004) did study on ‘Gender Equality in Education. ’ He wrote While 30 million more children had been sent to school globally since 2000, there were still 72 million children, most of the girls which remains out of school. While girls' participation had increased to 89% from 84% a few years back, Burden said more



needed to be done especially for disadvantaged girls are countries like Nepal.” Half of Dalit (low caste) girls drop out in grade I only eight percent make it to grade V”, he said adding that strong political leadership in this areas is important. The problem of infrastructure also continuous to the educational system in Asia pacific now, a lot of school had no drinking water, toilet and electricity. Teachers were also ill-trained and poorly motivated. Other problems included the lack of text books, teacher, classrooms and proper medium of instructions. Discrimination based on caste, ethnicity, Religion or disabilities also needed to be seriously addressed.

Dhakal (2006) did a research on “Factors affecting the girl's student's attitude towards selecting optional mathematics at secondary level” with the objective to find the factor affecting the girls students attitude towards selecting optional mathematics at secondary level. Hundred students were selected from syangja District who had offered the optional mathematics course in secondary level. This study concluded that nine variables such as teachers’ behavior ,prior achievement level, job taking mission in future ,plans of further study ,parental support, social influences, peer group influences, self-confidence and girl’s interest come out to be influencing factor of the girls to make positive attitude towards mathematics in the context of Nepal.

Jnawaly (2007) did a research on the topic “causes that affect mathematics achievements of girls” with two objectives to determine the correlation between affecting factors and mathematics achievements of girls students in terms of school related factors and out of school related factors. For this research researcher has be selected 50 girls students from 10 public schools of sampled students students was obtained through the students questionnaire from and achievements from school record. Various statistical techniques such as mean, correlation coefficient and regression analysis were used to analyze the collected data

Bohara (2009) Studies on “Factors Affecting on Achievement of Dalit Students in Mathematics at Lower Secondary Level (A case study in Daijee VDC, Kanchanpur District)”. The main objective of his study is to find out the factors affecting on achievement of Dalit girls in mathematics. He had used semi structured face to face interview with mathematics teacher, case respondents with their guardians and classroom observations to collect primary data for only one case school of Kanchanpur district. His study concluded that illiteracy, ignorance, poverty, prior knowledge, motivation for study at home, parental support, quality of teacher, class size, student teacher interaction, social belief, social tradition, family occupation, childhood marriage, working in upper cast family were the major affecting factors on mathematics achievement of the Dalit students.

Joshi(2010) did a research on “Attitude of girls 'students towards optional mathematics at secondary level” His main objectives were to find out the attitudes of secondary level girls students towards optional mathematics and compare the attitude of urban and rural girls towards optional mathematics. A set of opinionnaire and interview guideline were used as tools for the data collection. The  $\chi^2$ -test was applied to find out the attitudes of secondary level girls students towards optional mathematics and t-test was used to compare the attitudes of urban and rural girl’s students. He found that there was a positive attitude towards optional mathematics and there is no significant difference between attitude of urban and rural girls towards optional mathematics.

Pokharel (2010) did the research on “Girl’s participation in optional mathematics in Dolpa district.” The objective of the study is to find the factors that affect the participation of girl’s in optional mathematics. There are fourteen secondary schools in Dolpa district. Among them the researcher selected three urban schools and

three rural area schools for study. Researcher used the interview schedule and oppininare form for data collection tools .He was found that the home environment such as gender bias at home, parent's education, practice time given to solve problem, economic condition of family influence in the girls participation on optional mathematics.

Pokharel (2011) conducted his thesis on the topic “Girls Participation in learning mathematics “at secondary level. The objective of this study were to identify the girls participation in learning compulsory mathematic among thami girls student at secondary level and to find out the cause of low participation of girl in learning compulsory mathematic at secondary level. Only six thami girls of grade-IX were selected purpose study as cause respondents from kalika Higher Secondary of Chemawati VDC and Dolakha district. Semi-structured interview schedule and observation form were used to collect primary data for this study. Triangulation was adopted to maintain the validity of the data and thematic categorization was used to analyze the collected data. Moreover, the collected data were justified and this interpreted accordingly to the culture difference and discontinuity theory. The main finding of the study is thami girl’s participation in compulsory mathematic is low mainly due to language problem, poverty, illiterate parents, gender discrimination and dominated behavior by thami students. Therefore from the finding it is concluded that most of the thami girl’s students were forced to discontinue schooling because of language difference in home and at school, cultural discrimination, male dominance society, poverty, and illiterate parents. So, thami girls have no time for learning mathematics at home

Raymajhi (2011) Conducted a research study entitled “Cause of low participation of girls of rural community in optional mathematics” The case study

design was attempts to identify the cause of low participation of girls students of rural community in optional mathematics at secondary level and concluded that girls students are equally capable in achievement view point but due to the school as well as out of school related factors their participation is low in optional mathematics and some of them are as follows:

- Parents expected less from girl's education and so cared less about it.
- Teachers failed to link girls' practical experience with theoretical knowledge.
- Girls' were confined to domestic chores and hence could not give enough time to mathematics.
- Girl's fear that mathematics subjects are difficult considering it as the boy's domain only.

Concisely, social factors such as discrimination behavior, economic condition, and lack of time for hard work are the responsible factors for making low participation of female in the study of mathematics. To increase the girl student's participation in learning mathematics, mathematics intensive fields of study and science & technology oriented professions, pedagogical as well as policy consideration should be focused in these variables. After analysis and interpretation of data, the findings indicates that girl students are equally capable in achievement view point but due to the school as well as out of school related factors their participation is low in optional mathematics.

Bhatt (2015) did a research entitled "Causes of low participation of dalit girls in learning mathematics". They study attempts to identify the present situation of dalit girl students and find out the causes of low participation of dalit girl students in learning mathematics at secondary level. He applied case study design in his study

.The study was conducted with the sample size of four dalit girl students of grade X selected from Shree Purna Higher Secondary School, Vimdatt municipality-12, Kanchanpur. This study used three types of tool such as interview schedule, observation and document analysis to collect the data. The collected information was analyzed by thematic categorization and interpreted according to the cultural difference. This study shows that engaged of household work ,poor economic condition, illiterate parents, over aged/early marriage, socio cultural norms and values, family occupation etc. are the causes of low participation of dalit girl students in learning mathematics.

### **Theoretical Literature**

In dealing with the study, there is suitable theories which could be more applicable so as to bring the valid and more accurate was through doing the research study.

### **Social Constructivism**

Social constructivism is a kind of learning perspective focuses on social activities. It gives importance to the culture and context in understanding what appear in society and constructing knowledge based on this understanding. This perspective is based on specific assumption about reality, knowledge and learning. Social constructivist believes that reality is constructing through human activity. Members of a society together invent the properties of the world.

For social constructivist reality cannot be discovered and it doesn't exist prior to its social invention. To social constructivists, knowledge is also a human product is socially and culturally constructed (Earnest, 1997). Individuals create meaning through their interaction with each other and with the environment they live in. In the

view of social constructivism, learning is a social process. It does not take place only within an individual, nor is it a passive development of behaviors that are shaped by external forces. A learner cannot learn in isolation, so meaningful learning occurs only when individuals are engaged in social activities.

As I have earlier said that social things like cultural or racial, gender inequality, poverty play a fundamental role in participation of female in mathematics learning. According to this theory, reality and knowledge are constructed through human activity as well as members of a society either male or female together create the properties of the world. It means that every individual has a capability to do something and it doesn't affect by their masculinity. Every learning whether it is related to mathematics or other areas is not possible without social behavior which implies that in society, male and female have equal importance in their own stand. Therefore, this theory gives emphasis to those female students who are hesitating to learn mathematics, it helps to develop self-confidence and encourage them to actively participate in mathematics classroom.

### **Woman Empowerment**

Woman education, which is somehow linked to empowerment of woman, is a topic of high importance in the recent times for the overall development of the country. Entire nation, business, communities and groups can benefit from implementation of programs and policies that adopt the notion of woman empowerment.

Empowerment of woman is one of the major procedural concerns while addressing human rights and development. Approach, The Millennium Development goals, and other credible approaches aim at the point to empowerment and

participation of woman to the overall development of woman (Sodhi,2012). Similarly, empower “refers to gaining or recovering one’s own power or giving power to someone else. Empowerment in any sense that really matters must result in a substantive transfer of resources”.

Empowerment is not giving people power; people already have plenty of power, in the wealth of their knowledge and motivation and to do their jobs magnificently. I would like to define empowerments letting this power out (Blanchard, 1996, p.13).Empowerment is necessarily linked with participation. Once they participate, they obtain the skill and knowledge that will allow them to overcome from obstacles in their life or create working environment and, ultimately, help them to develop within themselves as well as in the society.

According to World Bank(2001) the active participation of woman, whether in education, income generation, social protection, or governance, contributes, consistently to more effective development(as cited in koirala,2003).The report further states that “the impact of woman’s education on the nutritional status, life expectancy, and general welfare of children is already well documented”. Now after acknowledging this report we can say that woman education is important as it has far reaching results; first it makes woman empowered and effects on quality life of a whole family.

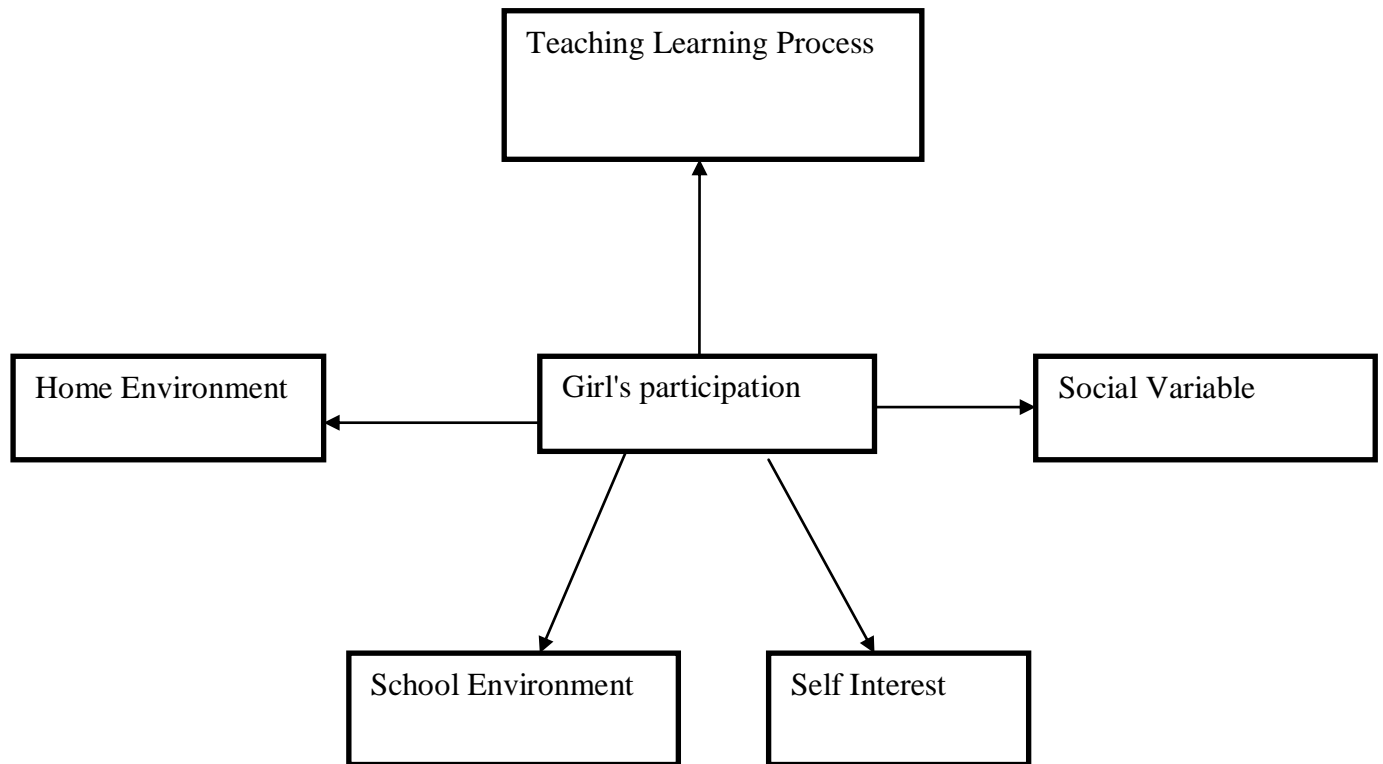
Empowerment also means involving in the growth process and changes that is never ending and self –initiated; increasing one’s positive self-image and overcoming stigma; and increasing one’s ability in discreet thinking to sort out right and wrong(Sodhi,2012). Participation in different activities empower woman. When they participate in various activities they become active and it contributes in changing their way of thinking. It also promotes women to be familiar with new technologies.

## **Conceptual Framework**

In this study, the main participants are school principals, mathematics teacher and girl students of secondary level. This study intends to found participation of girl's in mathematics class room. So this study focused on three aspects of research questions. In addition, I also want to explore the supporting factors for girls to participate in mathematics classroom and various ways that can be used to promote participatory learning for them. As discussed above related literature, participation of girl students in Mathematics at secondary level may depend under different variables. Generally participation of girl students in Mathematics at secondary level specially in girls influence from teaching learning process, home environment, school environment , social variables and self interest towards mathematics. Under teaching learning process teachers' qualifications, interest of learners, expectations of teachers, views and beliefs of teachers about girls' participation will discuss. The variable related to home environment consists gender bias in home, parents education, practice time providing at home for children especially daughters, economic condition of parents, study hour of children at home. The physical facilities, students' number in classroom, gender bias, teachers and peers behaviors are considerable elements for doing better or worse students in Mathematics at secondary level. Social variable is also non separable and important factor on participation students in Mathematics at secondary level. This includes social system, culture customs, and traditional effects of gender in society. I described all these things with relevant theories by the help of interview, interaction and observation. The researcher develops the following framework with the help of those variables.



## Conceptual framework about participation of girls in Mathematics



(Source: [www.Unesco.org/education/educprog/...](http://www.Unesco.org/education/educprog/))

The above diagram relates the participation of girls in learning mathematics on the basis of home environment, school environment, and self interest towards mathematics, social variables and teaching learning process.

## **Chapter – III**

### **METHODS AND PROCEDURE**

This chapter presents the procedure of the study which was carried out to achieve the objectives of the problem. This chapter delineates design of the study, population of the study, sample of the study, tools of the study, reliability and validity of the study, data collection procedure and data analysis procedure used to collect the information.

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

Research design refers to the plan that specify the population to be studied and the method of data collection. Researchers enable to be choose the design that best enable them to address research question at hand (Smith, 1991).

The formidable problem that follows the task of defining the research problem is the preparation of design of the research project, popularity known as the ‘research design’. Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design. “A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.” In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data (Kothari, 2004). This study was based on survey design. To explain the term survey, it is a form of plan to collect the information for the purpose of analyzing the

relationship between certain variables. Thus, this study is more quantitative as well as qualitative in nature including some description of the phenomenon.

### Population of the Study

The population of the study consisted of all regular girl students at secondary level mathematics in grade IX in academic year 2073 B.S. in Gorkha district.

### Sample of the Study

The researcher selected the school from Gorkha district by stratified random sampling. Among the 68 secondary schools in Gorkha, three urban and one rural area school (two governments and two private schools) were selected as sample. For the interview, one mathematics teacher is selected from each school. There were 112 girls students on selected schools, among them 70 regular students were selected as sample of the study. The following table gives the clear picture of the sample selection.

**Table 2: School/Gender-Wise Presentation of Sample**

S.N.	Schools' Name\Area	Gender	no of student	Total no. of students	No. of sample	Sample %
1.	Shree Bhawani Secondary School	Male	77	140	30	21%
		Female	63			
2.	Shree Amar Jyoti Janata Secondary school	Male	42	75	25	33%
		Female	33			
3.	Shree united Secondary School	Male	10	21	10	48%
		Female	11			
4.	Bal Jyoti Secondary School	Male	13	18	5	28%
		Female	5			

## **Tools of the Study**

Every study needs tools to collect data. Likewise, one set of opinionnaire, one set of interview guideline were the main tools of the study. The researcher collected data by observation based on the following guidelines:

### **Opinionnaire Scale**

Information that attempts to measure the attitude of belief of an individual is known as an opinionnaire scale. So, one set of opinionnaire was developed as an instrument for the collection of needed information which was used for girl students. Prior to construct those tools for the study, the following cause of the girls' participation in mathematics were identified from the review of literature with the help of experts and advisors. Teaching learning process, home environment, school environment, self interest, social variable was the factors that were included in this study. It is assumed that these variables as already established could influence the girls' participation in Secondary level mathematics in Education of Nepal (Particular in Gorkha District).

One set of opinioinnaire scale was developed having Thirty five statements related to the above variable (see Appendix-A) for the girls students who are studying at grade IX in Gorkha district. These scales were developed in Likert Scale. Both positive and negative statements were included in the scale. Scoring of the statements was done as shown in the following table.

**Table 3: Likert-Scale Point Used in Technique of Scoring**

<b>S.N.</b>	<b>Meaning of rating</b>	<b>Rating of Score</b>	<b>Negative Statements</b>	<b>Positive statements</b>
1.	Strongly Agree	5	1	5
2.	Agree	4	2	4
3.	Undecided	3	3	3
4.	Disagree	2	4	2
5.	Strongly Disagree	1	5	1

This study has used opinionnaire for measuring girl students' attitude towards the factors that affect on their participation in mathematics with the help of the variable given in theoretical framework of this study.

### **Interview Guideline**

Interview is a process of communication or interaction in which subject or interview gives the needed information verbally in a face to face situation. Interview is encouraged to respond towards the question after building a better rapport. There are many types of interview; especially direct 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 (see Appendix-B) to collect the information from mathematics teacher because semi-structured interview was used to discover in-depth understanding of people in the phenomenon of the study.

## **Reliability of Instrument**

Reliability of the research instruments is the necessary qualities of instrument. For the purpose of reliability of achievement test, pilot test was conducted at Bhawani Secondary School, Thatipokhari, Gorkha district. The average time taken by the students to complete the items was 45 minutes. The number of students participated in the pilot study was 10 students.

Again for the purpose of establishing reliability of opinionnaire, one secondary school was selected from Gorkha District to implement the procedure of testing reliability and validity. There are one set of opinionnaire with rating scales for the given statements. Strongly agree, agree undecided, disagree and strongly disagree with rating 5,4,3,2 and 1 respectively in each statements. To ensure the reliability, researcher had conducted the found the reliability as 0.79 which is the high score for reliability of each statement. And interview was valid for particular purpose and for a particular group. The interview helped to know why they were failed in mathematics at secondary school.

## **Validity of Instrument**

Validity is that quality of a data-gathering instrument or procedure that enables it to measure what it is supposed tso measure. Reliability is a necessary but not sufficient condition for validity. That is, a test must be reliable for it to be valid, but a test can be reliable and still not be valid. For making tools; the researcher consulted to subject expert, specialist and supervisor and their suggestions were taken to further standardize the questions. Validity of tools was established by expert judgment method and reliability by test retest method.

## **Data Collection Procedures**

After selecting the sampled secondary schools randomly, the researcher visited the related secondary schools with instrument to collect data. Before administration of the tools, researcher met the authorities and explained the purpose of the study in detail. Once the principal of the secondary schools agree to allow the study to be carried out, the researcher arranged the date and time for administering the instrument when the students and teachers assembled ready to participate in the study, the researcher explained its purpose and relevance and research tools were administered in group with direct supervision. The data was achieved by administering the opinionnaire test paper, interview and observation schedule among the sampled student. Finally the researcher scores for the analysis. For the opinion of girl students, the researcher distributed opinionnaire form for sampled students and translated each statement one by one in course of administering the opinionnaire (see in appendix A). After getting response of all the students, the opinionnaire was taken back with thanks.

With the help of semi-structured interview schedule, the interview was conducted with mathematics teachers of each sampled secondary school. For this purpose, the researcher took permission letter from Central Department of Education, T.U., Kirtipur and he was hand over the letter to the Principal of sampled secondary schools.

## **Data Analysis Procedures**

Before analyzing the data, it is necessary for organization of data and so that data had been organized by using computer. Organized data has been presented in tabular form on basis of the variables used in the research process. This study was

based on quantitative data and therefore preliminary part of analysis was based on descriptive statistics. After the injection of descriptive statistics, the researcher used inferential statistics: Chi-square ( $\chi^2$ ) test on the SPSS 21.0 for the purpose of analyzing and interpreting the test results. But descriptive statistics was only injected for the purpose of analyzing the data obtained from Likert's scale. Finally, collected data were analyzed through thematic approach of analysis in which theme of each individual's response had been coded for generating final theme.



## **Chapter – IV**

### **ANALYSIS AND INTERPRETATION OF DATA**

This chapter deals with the analysis and interpretation of collected information of the study. The collected information from the informants was analyzed and interpreted to find out the girls' participation in mathematics. It has already been mentioned that this research is aimed to find out the girls' participation in mathematics where descriptive analysis was used to determine the influencing causes of girl's participation in mathematics. The main focus of the study is to find out the participation of girls in mathematics.

The researcher had used different types of data collecting tools in this study. Direct observation was done in the classroom. The classroom behavior of student and teacher was carefully observed and noted. The students' home environment and their behavior was evaluated by the researcher with the help of interview guideline. The researcher interviewed with the mathematics teacher and head teacher of the school. The researcher had also noted the key students pre-class documents, their regularity in class, their behavior etc. from school documents.

According to Willinson and Bhandarkar (2002), analysis of data involves a large number of operations that are very closely related to each other. These operations are carried out with the aim of summarizing the data that has been collected and then organizing. This summarized data in a way that helps in getting the answer to the various questions or may suggest hypothesis.

#### **The Level of Participation of Girls' Students in Mathematics**

The first objective of the study was to find out the participation of girl's in mathematics at secondary level. In order to find the level of girl students participating

in mathematics, for this the researcher observed their daily behavior activities by sitting back side of class room. Then analyzed and interpreted as follows:

**(a) Regularity of Sample Students**

The regularity of students directly affects the achievement of students. The following table presents the regularity of sample students.

**Table 4: Attendance Percentage of the Students**

<b>Sample Schools Students</b>	<b>Shree Bhwani SS Thatipokhari</b>	<b>Shree Amar Jyoti Janata SS Luintel</b>	<b>Shree United SS Thatipokhari</b>	<b>Shree BalJoti SS Thatipokhari</b>
Boys %	89	86	72	85
Girls %	72	80	73	69

This table shows that the attendance percentages of girls’ students were comparatively less than boy students in every sample secondary schools. According to sample secondary schools register, the highest attendance percentage of boys was 89 percent on Bhawani Secondary School, thatipokhari and the lowest attendance percentage of boy students was 72 percent of united Secondary School, Thatipokhari. It also shows that, according to observation, the highest attendance of girl students was 80 percent of United Secondary School, thatipokhari and the lowest attendance of girl students was 69 percent of Bal Jyoti Secondary School, Thatipokhari. So the researcher found the level of participation of girl students in Mathematics was low to compare with boys students.

### (b) Class Work and Homework Complete by the Sample Students

Class work and homework are the most important factor in learning. It increases the level of learning and understanding. Here the table presents the class work and homework done by boys and girls students.

**Table 5: Percentage of Class Work and Home Work Done by Students**

Sample School Students	Shree Bhawani SS Thatipokhari		Shree Amar JyotiJanata SS Luintel		Shree United SS Thatipokhari		Shree BalJyoti SS Thatipokhari	
	C.W.	H.W.	C.W.	H.W.	C.W.	H.W.	C.W.	H.W.
Boys%	92	78	84	66	87	79	87	75
Girls %	66	55	64	72	65	53	80	83

This table shows that the percentages of class work as well as homework done by girl students were low in maximum sample secondary schools. The highest and lowest percentages of class work done by boys were 92%/84% of Shree Bhawani Secondary School, Thatipokhari /Shree Amar Jyoti Secondary School, Luintel and the highest and lowest percentages of home work done by boys were 79%/66% of Shree United Secondary School, Thatipokhari/Shree Amar Jyoti Janata Secondary School, Luintel respectively. But the highest and lowest percentages of class work done by girl students were 80%/64% of Shree Bal Jyoti Secondary School, Thatipokhari / Shree Amar Jyoti Janata Secondary School, Luintel respectively. But the researcher found that the level of girl's participation in mathematics was low.

### (c) Interaction with Peers

Good interaction behaviour among friend creates the good harmonious

environment in classroom. Thus, this table shows the participatory learning environment between peers.

**Table 6: Peers Students Interaction in Classroom**

<b>Sample schools</b>	<b>Girl students</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>
Shree Bhawani SS Thatipokhari	63	Poor	Normal	Normal
Shree Amar Jyoti Janata SS Luintel	33	Poor	Normal	Poor
Shree United SS Thatiokhari	11	Poor	Normal	Poor
Shree Bal Jyoti SS Thatipokhari	5	Normal	Good	Normal

From this table the researcher found that, by observing class in corresponding schools, the researcher found the overall interaction with peers among students to be normal. In the first day, the researcher found that the girl students were hesitating to discuss with friends. But day by day, the researcher found that the girl students were improving themselves by discussing/asking problem with each other but never seen interacting with boy friends. The research also showed that the girl students of urban area always discussed with their girl friend as well as boyfriends but the girl students of rural area discussed only with girl friends but never interacted with boyfriends.

**(d) Interaction with Teachers**

Interaction with teacher and student also create good environment in classroom and school. This environment involves the participatory learning environment within student and teacher leading to quality education.

**Table 7: Teachers Students Interaction in Classroom**

<b>Sample Schools</b>	<b>Girl students</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>
Shree Bhawani SS Thatipokhari	63	Good	Normal	Normal
Shree Amar Jyoti SS Luintel	33	Poor	Good	Normal
Shree United SS ThatiPokhari	11	Good	Normal	Normal
BalJyoti SS Thatipokhari	5	Poor	Good	Normal

This table shows that the girl students of every secondary school were interested to ask question or discuss with teacher which was not understood properly. So the researcher can conclude that the interaction of girl students with teachers was satisfactory in the sample school.

**(e) Extra Curriculum Activities of Students**

Extra curriculum activities have great influence in the improvement of knowledge and be successful because it refers to the eagerness of the learners to learn. So how much the student obtains depends on the student is interested in extra curriculum activities.

**Table 8: Extra Curriculum Activities**

<b>Sample schools</b>	<b>Girl students</b>	<b>Day 1 (participate)</b>	<b>Day 2 (participate)</b>	<b>Day 3 (participate)</b>
Shree Bhawani SS Thatipokhari	63	0	5	2
Shreee Amar Jyoti Janata SS Luintel	33	3	3	7
Shree United SS Thatipokhari	11	7	0	2
Shree Baljyoti SS Thatipokhari	5	0	0	1

This table shown that, the participation of girl students in extra curriculum activities was low. In the first day observation class, the researcher shown that participation of girls in comparison of admission was few. Among them, the participation of girls was few in ECA. In the same way, the observer found that in second and third day observation classes, the enrolment of girl students in ECA was few.

### **The Participation of Girls' Students in Mathematics**

The information obtained from an Opinionnaire scale and semi- structured interview schedule is analyzed and interpreted in this part. There are several factors affecting the girls' participation in mathematics. With the help of related literature and theory, it was assumed that the different five variables directly affected the girls' participation in mathematics. Such variables are described separately as follows.

#### **Teaching Learning Process**

Theoretically, it was assumed that girls' participation in mathematics is influenced by the teaching learning process. Teachers' qualification, interest of learners, expectation, views and beliefs toward mathematics are explained under the teaching learning process. Teachers' qualification as determined by education, experience, expertise and licensure has been shown to be the single most significant factor contributing to student participation. Interest of learners is also an important determining factor in students' participation. If students do not have curiosity to learn the teacher cannot teach. The expectations of teacher, parents and students themselves have a significant effect on participant levels. Vygotsky,(1978) states that teacher should always encourage to develop ZPD in classroom. He also said that left the students free in classroom to gain new knowledge, students create solve their problem by their

own activities. Different research shows those students who are expected to learn are more likely to participate in school. It has been shown that teachers generally tend to have lower expectations for minority children and children from poor families. Girl students' interest and beliefs also effect the achievement in mathematics. Many articles suggest that girls have negative attitudes and expectations for their performance in mathematics. According to constructivism teachers and parents are a part of the learning to motivate the learners. Those girls who can't solve the mathematical learning they need to take help from their teacher's parents and peers .It is called scaffolding method.To increase girl's participation at secondary level mathematics.The role of teacher most important and parents are careful about girls interest teacher's should be manage scholarship of poor girls student to motivate to read.Traditional attitude towards girls education of parents should be reduce by giving awareness.

- "Girls life is inside the four walls".
- "Girls most know house hold works than education".(Rayamajhi,2011)

Teachers' teaching style such as their use of cooperative rather than comprehensive learning also plays a vital role in girls' relationship with mathematics. The following seven statements define the teaching learning process that can influence girls' participation in mathematics.

**Table 9:  $\chi^2$  Value about the Influence of Teaching Learning Process in  
Mathematic**

	<b>Statements related to Teaching Learning Process</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Undecided</b>	<b>Disagree</b>	<b>Strongly</b>	<b><math>\chi^2</math> value</b>	<b>Decision</b>
1	I am not curious and active while learning mathematics.	1 (1.4)	11 (15.7)	17 (24.3)	36 (51.4)	5 (7.1)	53.71	S
2	I enjoy when solving mathematical problems.	13 (18.6)	37 (52.9)	19 (27.1)	1 (1.4)	0	38.57	S
3	The class of mathematics is less interesting than other.	5 (7.1)	47 (67.1)	11 (15.7)	7 (10)	0	67.37	S
4	Our teachers try to make the mathematics class interesting.	5 (7.1)	30 (42.9)	22 (31.4)	12 (17.1)	1 (1.4)	41	S
5	Mathematics is an essential part of the science and technology.	16 (22.9)	38 (54.3)	14 (20)	2 (2.9)	0	38.57	S
6	Teaching materials is used while teaching mathematics.	0 (1.4)	6 (8.6)	13 (18.6)	50 (71.4)	1 (1.4)	84.62	S
7	Mathematics teachers are trained to motivate.	3 (4.3)	31 (44.3)	25 (35.7)	11 (15.7)	0	28.05	S

The statements were tested using  $\chi^2$ -test at 0.05 level of significance. The statements no. (1) is significant with  $\chi^2$ -value 53.71 at 0.005 level of significance. From the total sample students 51.4% of sampled student were disagree and 7.1%



were strongly disagreed with this statement. Hence majority of student are curious and shows they have more interest in learning mathematics. The statement first, second and third are related with the interest of teacher. The statement no. (2) is significant with  $\chi^2$ -value 38.57 at 0.05 level of significance. In this statement 18.6% student were strongly agree and 52.9% student were agree. This indicate that they enjoy when solving mathematic problem.

Likewise, statement no. (6) has  $\chi^2$ -value 84.62 at 0.05 level of significance. About 1.4% students strongly disagree and 71.4% disagree with this statement. From this we can say that teacher do not use teaching materials while teaching mathematics sufficiently. Statement no. (7) Was also found to have significant with the  $\chi^2$ -value 24.75 at 0.05 level of significance. About 44.3% student agree and 4.3% student strongly agree with this statement which indicate all mathematics teacher are trained on motivating students with different ability. From all these statement it is concluded that the teachers qualification, interest of learner, use of teaching materials, expectation etc. are the influencing factors in participation of girls students in mathematics.

In addition to quantitative information the interview was taken with the mathematics teacher to derive qualitative information regarding the influence of teaching learning process in mathematics. According to the information provided by the mathematics teacher, the main influencing in participation of girls' were the interest of learners, teachers' qualification and method of teaching, limited time period, the teacher uses sufficient teaching materials or teaching aids while teaching mathematics. Most of the teachers use traditional method. On the other hand, girl's participation in teaching learning process is low.

Hence, from the result analyzed in quantitative techniques and responses of math teacher in interview it is concluded that the teaching learning process is the main influencing factor of girls' participation in mathematics.

### **Home Environment**

Home is considered as a foundation of education. Theoretically, it is assumed that the participation of girl in mathematics is highly influenced by the home environment. Parents' education, socio-economic conditions of family, study hour at home, practice time of mathematics and gender bias in family generally considered as the home environment. The participation of child depends not only on the part played by 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 participation of students. Various researches have shown that higher the socio-economic status of family have the greater children participation. The roles, responsibilities, contains, opportunities, practice time given by family to daughter in home is also played the vital role on the participation of girl in mathematics. The following seven statements given in table 9 are related to the home environment support in course of learning and sorts of pressure created to girl students' participation in mathematics.

**Table 10:  $\chi^2$  Value about the Influence of Home Environment in Mathematics**

S.N.	Statements related to Home Environment	Strongly agree	Agree	Undecided	Disagree	Strongly	$\chi^2$ value	Decision
8	My parents do not manage all required materials for the study of mathematics.	0	12 (17.1)	6 (8.6)	42 (60)	10 (14.3)	46.8	S
9	My parents treat unequally my brother and me.	0	2 (2.9)	9 (12.9)	33 (47.1)	26 (37.1)	35.71	S
10	My parents do not discuss about my performance with basic math teacher.	0	4 (5.7)	24 (34.3)	37 (52.9)	5 (7.1)	43.48	S
11	My family manages tuition and coaching if necessary	6 (8.6)	27 (38.6)	33 (47.1)	4 (5.7)	0	36.85	S
12	I have no more time to study mathematics at home.	0	5 (7.1)	14 (20)	49 (70)	2 (2.9)	80.05	S
13	Learning environment of mathematics is Better for me at home.	4 (5.7)	39 (55.7)	17 (24.3)	9 (12.9)	1 (1.4)	66.28	S
14	My parents always say me to do not spend more time in mathematics at home.	0	6 (8.6)	32 (45.7)	24 (34.3)	8 (11.4)	27.14	S

As in the above table statement no.( 8 ,9 and 10) are significant with the  $\chi^2$ -value 46.8 , 35.71 and 43.48 at 0.05 level of significance and more than 60% student disagree and 37.1% student strongly disagree with these statement. It refers that the parents treat equally and manage the learning materials.

Statement no. (12) is significant with  $\chi^2$ -value 80.05 at 0.05 level of significance. About 70% students disagree this statement. This indicate that girls have no more time to study at home. Statement no. (13) is significant with  $\chi^2$ -value 66.28 at 0.05 level of significance. About 12.9 % students disagree this statement. So from their responses it is concluded that the gender bias at home is also responsible to increasing the participation of girls student in mathematics.

Beside the quantitative data, the researcher had conducted interview to the teacher to collect qualitative information about the influence of home environment on participation of girl students in mathematics. and it has been found that parents education, parents behaviors, study time at home are the influencing factor on participation of girls in mathematics. Due to the less priority given by the parents to their daughter in learning mathematics is main cause of low participation of girls in mathematics.

### **School Environment**

Among the many factor influencing the girls participation in school mathematics is School environment. Researchers showed that planners should give serious consideration in designing learning environments outside of the traditional classroom. Moreover, more attention should be given to the exterior design of school buildings. The classroom lighting, color choices and windows play a significant role in the participation of students. The teaching materials managed by school, number of

students in classroom, teachers behavior towards girl students, peers behaviors with their friends, collaboration, sharing of knowledge questions answer to the teacher and student and roles, responsibilities and opportunities given by school and teachers to the girls student are main determining factors for girls' participation in mathematics. The following seven statements define the positive influence of school environment in girl students' participation in mathematics school curriculum.

**Table 11:  $\chi^2$  Value about the Influence of School Environment in Mathematics**

S.N.	Statements related to: School Environment	Strongly	Agree	Undecided	Disagree	Strongly	$\chi^2$ value	Decision
15	School manages all the teaching materials for Mathematics.	7 (10)	37 (52.9)	21 (30)	5 (7.1)	0	37.14	S
16	Teachers teach focusing the boys more than girls	7 (10)	49 (70)	12 (17.1)	2 (2.9)	0	78.45	S
17	Teachers are always suggestive to motivate girls student to study mathematics.	1 (1.4)	32 (45.7)	26 (37.1)	10 (14.3)	1 (1.4)	58.71	S
18	I like to solve basic mathematical problem with my friends in class	1 (1.4)	12 (17.1)	18 (25.7)	28 (40)	11 (15.7)	28.14	S
19	It is difficult to ask the problem which has not been understood.	0	3 (4.3)	16 (22.9)	42 (60)	9 (12.9)	50.57	S
20	The math teachers teach regular in the class.	37 (52.9)	24 (34.3)	8 (11.4)	0	1 (1.4)	44.85	S
21	teachers and students help to study mathematics.	28 (40)	37 (52.9)	5 (7.1)	0	0	23.34	S

From above table statement no. (15) is significant with the  $\chi^2$ -value 37.65 at 0.05 level of significance. More than 52.9% students agree on this view that school manages all the teaching materials for learning mathematics.

Likewise, statement no. (16) is significant with  $\chi^2$ -value 78.45 at 0.05 level of significance. More than 17.1% students undecided whether teacher teach focusing the boys more than girls.

Statement no.(18) is significant with  $\chi^2$ -value 28.14 at 0.05 level of significance. This shows that more than 17.1% of the sample students agreed and 40% of the students disagree with solving basic mathematical problem with their friends in class. Statement no. (19) is also significant with  $\chi^2$ -value 50.57 at 0.05 level of significance. More than 42% sample student disagree that they do not feel difficult in classroom. It reveals that girls student feel no difficult to ask problem which has not understood while learning mathematics.

Statement no. (20 and 21) is also significant with  $\chi^2$ -value 44.85 and 23.34 respectively at 0.05 level of significance. This shows that more than 37% student agreed with these statement. This means the teacher are punctual in class and all the teacher and student help to study mathematics from these all statement it can be concluded that school environment which is existed in our context is also an influencing factors on girl's participation in mathematics.

Interviews were taken with the mathematics teacher to get the qualitative information concerning the role of school environment on girls' participation in mathematics. Most of the teachers' views were the low school facilities, limited teaching materials and culturally biased view about educating the girls children in the

family members and the society as a whole are the main cause of low participation in mathematics.

Hence from the above discussion it can be concluded that the school environment which is not better to acquire high result is also the cause of low participation in mathematics.

### **Self Interest**

According to theory reviewed above, it is assumed that self interest towards Mathematics is also an influencing factor on participation of girls in mathematics. Some error like as reading error, comprehension errors, transformation error, process skill error, encoding error. It happened due to negative attitude towards mathematics. An error was classified as reading errors if a student could not read a key word or symbol. The comprehension error is an error in which the student cannot grasp the overall meaning of mathematics problem is known as translation errors. If the students have no idea to identify the operation or sequence of operation needed to solve the problem. An error was classified as process skill error when a student was able to identify the correct operation but did not know the procedure to carry out these operations accurately. Encoding error was an error in which students are unable to express the solution in an acceptable written form. According to Bruner "any subject can be taught effectively in some intellectually honest form to any child at stage of development". He also states that in mathematics teaching teachers encourage girls students to read mathematics by using new teaching strategies. Above view of students and theory of Bruner conclude that without interest of any specific subject no one can take success. (Acharaya, 2015) The following seven statements define students' self interest towards solving problems of mathematics.

**Table 12:  $\chi^2$  Value about the Influence of Self Interest in Mathematics**

S.N.	Statements related to: Self interest towards mathematics	Strongly agree	Agree	Undecided	Disagree	Strongly	$\chi^2$ value	Decision
22	I feel difficulty in reading mathematics key words or symbols.	6 (8.6)	44 (62.9)	19 (27.1)	1 (1.4)	0	63.37	S
23	I feel hard to comprehend the overall meaning of mathematics.	18 (25.7)	44 (62.9)	6 (8.6)	2 (2.9)	0	61.42	S
24	I myself have no trick to solve any problem of Mathematics.	0	7 (10)	16 (22.9)	39 (55.7)	8 (11.4)	38	S
25	I need the help of teachers to solve any problem mathematics.	12 (17.1)	29 (41.4)	24 (34.3)	5 (7.1)	0	20.62	S
26	I cannot find myself the wrong of any mathematic question.	13 (18.6)	22 (31.4)	26 (37.1)	9 (12.9)	0	10.57	S
27	I always make mistake in problem.	4 (5.7)	23 (32.9)	33 (47.1)	10 (14.3)	0	29.08	S
28	I think mathematics is boring subject.	4 (5.7)	55 (78.6)	9 (12.9)	2 (2.9)	0	108.62	S



From above table the statements no.(22) and (23) are significant with  $\chi^2$ -value 63.37 and 61.42 at 0.05 level of significance. More than 44.3% student disagree to these statement and 14.3% sample student undecided to this statement that means almost all student have positive towards the statement. From these we can say that most of the students do not feel difficulty is reading, comprehending the overall meaning of mathematics.

Statement no. (26, 27 and 28) are significant with  $\chi^2$ -value 10.57, 29.08 and 108.62 with 0.05 level of significance. More than 2.9% sample student disagree and 78.6% student agree in theses statement and conclude that they can find their self the wrong of any mathematical question. They always don't make mistake in problem and don't think mathematic I boring subject. So it is concluded that the girls self interest towards mathematics is also a cause of low participation in mathematics.

Beside this qualitative analysis the researcher also took interview with the math teachers regarding the self interest of girls towards Mathematics. And according to them students can read and comprehend but are unable to solve the mathematics problem. Hence, inability of understanding mathematics is also the cause of low participation in mathematics.

### **Social Variable**

Theoretically it was reviewed that culture and social factors are responsible for the under participation of girls in mathematics. The different social variable such as social system, cultural customs, and traditional effects of gender biases are the main factors that minimized the girls' participation in mathematics. In olden days, boys were educated exposed to the society but girls were restricted to their kitchen and spent most of their time in helping their mothers in domestic work. This is the

traditional effect of gender equity which influences the girls' mental development and achievement. The following seven statements define the social and cultural factor which affects on student participation in mathematics.

**Table 13:  $\chi^2$  Values about the Influence of Social Variable in Mathematics**

S.N.	Statements related to: Social Variables	Strongly agree	Agree	Undecided	Disagree	Strongly	$\chi^2$ value	Decision
29	Our society unequally treats boys and girls.	0	2 (2.9)	10 (14.3)	31 (44.3)	27 (38.6)	32.51	S
30	There are literate people in our society.	4 (5.7)	27 (38.6)	31 (44.3)	8 (11.4)	0	20.57	S
31	Female have inferior place in our Society.	2 (2.9)	51 (72.9)	15 (21.4)	2 (2.9)	0	91.94	S
32	Low role and opportunity of girls in society.	8 (11.4)	30 (42.9)	28 (40)	4 (5.7)	0	30.80	S
33	Our society has no idea whether the subjects' matter of mathematics is good or bad.	0	1 (1.4)	2 (2.9)	62 (88.9)	5 (7.1)	151.37	S
34	The society and persons admire the girls in learning mathematics.	7 (10)	55 (78.6)	8 (11.4)	0	0	54.48	S
35	The society does not inspire girls to learn mathematics.	0	3 (4.3)	24 (34.3)	39 (55.7)	4 (5.7)	51.25	S

The above table shows that all statements are significant at 0.05 level of significance. The statement no. (29) is significant with  $\chi^2$ -value 32.51. From total sample student more than 44.6% student disagree and 36.8% strongly disagree on the view that society some equally treat boys and girls. Likewise statement no. (30) is significant with the  $\chi^2$ -value 31.43. This shows that more than 38.6% of the sample student agreed and 5.7% of the sample student strongly agree with the statement that society has more literate people.

Statement no. (31 and 35) are significance with  $\chi^2$ -value 91.94 and 51.25 with 0.05 level of significance respectively. More than 55.7% sample student disagreed with the statement 'female have inferior place in our society' and 'the society doesn't inspire girls to learn mathematics.

Statement no. (34) is significance with  $\chi^2$ -value 54.48 at 0.05 level of significance. More than 78.6% students agreed with this statement. This reveals that most of the people of society encourage and admire the girls to learn mathematics. From all these statements, it can be concluded that social variable in which low role and opportunity of girls in society is influence factor that effects the participation of girls students.

Vygotsk's (2011) states every function in the child's culture developments appears twice first on the social level and later on the individual. Every people born in society/community and grow up, so school as a miniature society where pupils learn everything so teacher support his/her for advance learner by own their creation. Beside quantitative testing qualitative information were collected from mathematics teachers regarding the relation of social variables in girls' participation. By the response of math's teachers, it was concluded that there is still misconception that

mathematics was what men did. This views and beliefs that mathematics and related fields are more appropriate for boys than for girls persist in many contemporary societies. On the other hand, a specific obstacle is the prevalent bad image of mathematics and mathematician in society and community. Some people hate mathematics because it caused their failures or the failure of their students at secondary school. Political, economics, religious and cultural condition of the society affects in the participation of girls in mathematics. The response of the interview of teacher and the result of opinionnaire scales are found in conformist remain same. So it is concluded that the girl students' participation in mathematics is influenced by social variable.

### **Analysis on Participation of Girls Students in Mathematics**

After the analysis and interpretation of data, the researcher found that the factors like teacher learning process, home environment, school environment, self interest in mathematics and social variable has influence on the participation of girls students in mathematics. From the above table the statement related to girl students, the most of statements are significant but from the above table 12 the two statements "I feel difficulty in reading mathematics key words or symbols." and "I need the help of teachers to solve any problem of mathematics." and from the table 13, the one statement "Low role and opportunity of girls in society" are insignificant. So at last, among these five factors of influencing girl students' participation in mathematics, the researcher concluded that the self interest in mathematics and social variable factors are most influencing factors to participate the girl students in mathematics. Because the self interest towards mathematics of girl students was not strong they always feel difficulty and worry about math subject that I will fail in the final exam. They always dependent upon sir and never use mind to solve mathematics problem themselves.

Another causing factor is social variable because the society treated unequally boys and girls and the role and opportunity of girls in society was low. So the researcher concluded that the factors self interest towards mathematics and social variable was most influencing factors of girl students' participation in mathematics.

According to constructivism and parents are a part of the learning to motivate the learners. Those girls who can't solve the mathematical learning they need to take help from their teacher's parents and peers.

The results of study show that the majority of the girls in this study generally did not regard themselves as learners who would be interested in Mathematics. They perceived Mathematics as difficult, too complicated and a masculine subject. Although many girls believed that they would be able to perform successfully in Mathematics, they themselves had no interest in doing so. In this study the results of the investigation suggests that girls had developed negative attitudes toward Mathematics. According to the results of this study, one can also conclude that girls may have less interest in mathematics than boys because of the ways teachers communicate with learners, often interacting more with boys than with girls during mathematics lessons. Also, the results indicated that some girls lacked parental support in the learning of Mathematics. Thus, one can conclude that the teachers and parents had negative influences on girls in the learning of Mathematics.

## Chapter V

### SUMMARY, FINDING, CONCLUSION AND RECOMMENDATIONS

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

#### Summary of the Study

This study was based on the survey study. The study design has utilized both quantitative and qualitative research approach. The main purpose of the study was to find out the participation of girl's in mathematics and to suggest the possible remedies to increase girl's participation. The population of the study consisted of all girls students. At grade IX, in the academic year 2073 of Gorkha District. For the survey purpose, the researcher employed convenient sampling techniques to select the sample Secondary schools in the first stage. Among 68 secondary schools of Gorkha District, four secondary schools which have three from urban and one from rural area were selected as the sample schools. All girl students of grade IX was the sample students of the sampled secondary school. There were altogether 254 students. Among them 142 were boys and 112 were girls students. The sample of the study was taken from 112 girls students. 70 girl students were selected from the defined population. The researcher used a one set of opinionnaire scale, observation schedule and one set of interview schedule for collecting information or data. Opinionnaire scale was used only to girl students to investigate the participation in mathematics. The opinionnaire scale was developed on basis of Likert five point techniques. The collected data from opinionnaire scale were analyzed by using  $\chi^2$  - test in 0.05 level of significance. Interview was carried out to the math teachers of the selected sample

secondary schools. Then, the researcher substantiating as triangulation to the qualitative analysis result from the qualitative information from the interviews.

### **Findings of the Study**

The major findings of the study are categorized as follows:

- Teaching learning process in which teacher's qualification, interest of learners, student as well as parents' expectation and their views and beliefs directly influence on girls' participation.
- It is found that home environment such as gender bias at home, parents' education, practice time is given to solve problem, economic condition of family and study hour of student at home influence in the girls' participation in mathematics.
- The school environment such as physical facilities of school, the number of students, gender bias at school, teachers and peers' behaviors towards girl students affect the girls participation in mathematics.
- From the analysis, it is found that continuous practice, review and application of mathematical concepts affect the participation of girl students in mathematics.
- The girls who were encouraged by society to study mathematics did better in mathematics, where as those who were discouraged did not do well in mathematics. Thus it can be concluded that the social variables such as social system, cultural customs, and traditional effects of gender directly influence the participation of girl students in mathematics.
- Form analysis, it is found that most of the girl students feel difficulty in reading, comprehend the overall meaning of mathematics and some time make mistake

in solving the mathematical problem. I concluded that they are doing better in mathematics but participation is low.

## **Conclusions**

Mathematics is a gateway to many areas of further study. The participation of girl students in mathematics is low. Society as a whole believed that female is mathematically less capable than male. Parents and teachers communicate this belief to the students. Society, home and college do not provide environment to girls to take higher education. They are capable to study mathematics but they are made incapable. Girls come to view their failures in mathematics as evidence that they indeed fell inferior and to view their success as flunks (to fail an exam). This reinforced the belief that they are not capable of doing well in mathematics. Females stop taking advanced mathematics courses in high school or college, believing too difficulties. Girl failure to acquire the knowledge necessary to achieve in mathematics is the matter of construction of positive attitudes towards mathematics.

Although mathematics education has been given an important place in curriculum of all level of schools and the university education. Most of the students fail in this subject. This is unknown factors impeded students' progress in this subject. In this case of failure, the number of girl students is very high. It is felt that girls are unable to catch the mathematical ideas what boys do. However, this reason is not scientific because different researches have shown that girls are also equally capable to do math with boys. But what is the causing factor that makes girls' failure in mathematics study has still not found.



In a conclusion of the study, mainly five variables such as home environment, school environment, teaching learning process, self interest and social variable are the influential variables for the participation of girl students in mathematics.

At last, it is concluded that girls are equally talented and should be given equal facilities at home and at school to learn mathematics. Parent and teachers should not consider boys as assets and daughter as a liability.

### **Recommendations and Suggestion for the Further Study**

In the context of Nepal, many students fail in mathematics and the trend is still in continue due to this, there were the less participation in mathematics. In order to ensure girls' access and participation in mathematics at higher education is low. Some measures were worked out. They include pedagogical change, tutorial support, development and distribution of model females' rosters, interaction between teachers, parents and students, gender sensitization, incentive, lab and library support, collegial monitoring and counseling and project work to accommodate practical experiences of the girls. These will contribute to making mathematics subjects more enjoyable. Besides, the study has developed an action plan to address the mathematical specific issues, identified action strategies and pointed out the responsible agency to implement intervention initiatives. These intervention initiatives includes action as well as programs to address socio-culturally oriented gender biased mindset, school based encouragement scheme for girls and those advocating girls' education, school support program and mathematical career expectation programs for girls. Thus, after analyzing the conclusions and implications of the study has made the following recommendations or suggestions for the further study to variable study's findings:

- Almost of the girl students are weak in mathematics and are not participation in mathematics education programs for girl students. Research can be conducted on this area.
- This study was done only in Gorkha District. For generalization of the result of the study, similar study should be done in a wide scope and large sample.

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**Appendix-A**

**Students - Opinionnaire Form**

Dear Students,

I am Sushma Devkota, a student of M.Ed.; 2072/73 Batch, specialization in mathematics education from Tribhuvan University, Faculty of Education, Kirtipur, Kathmandu, Nepal. I have tried to prepare a thesis on **“Participation of Girls in Mathematics”**. This survey is a part of this M.Ed. field research in order to submit to the Department of Mathematics Education as a partial fulfillment for the Master’s Degree in Education.

There are 35 statements concern with Mathematics achievement and participation of girls. There is right or wrong answer. The right answer is your own opinion of feeling. Please, read the statements carefully and give your own opinion about the intensity of putting tick mark (√) on any one of the five rating of each statement.

Here,

S.A. = Strongly Agree,    A = Agree,                      U = Undecided,

D = Disagree,                      S.D. = Strongly Disagree

Name:- .....    Date:

School:- .....    Sex:

Class:- .....    Roll no.:

Address:- .....

.....VDC / Municipality.    Ward no.:-

Math teacher's Name : .....

Principal Name : .....

S.N.	Statements	SA	A	U	D	SD
1	I am not curious and active while learning mathematics.					
2	I enjoy when solving mathematics problems.					
3	The class of mathematics is less interesting than other.					
4	Our teachers try to make the mathematics class interesting.					
5	Mathematics is an essential part of the science and technology.					
6	Teacher always use teaching materials while teaching mathematics.					
7	All mathematics teachers are trained on motivating students with different ability.					
8	My parents do not manage all required materials for the study of mathematics.					
9	My parents treat unequally my brother and me.					
10	My parents do not discuss about my learning progress report with basic math teacher.					

11	My family manages tuition and coaching if necessary					
12	I have no more time to study mathematics at home.					
13	Learning environment of mathematics is Better for me at home.					
14	School manages all the teaching materials for Mathematics.					
15	Teachers teach focusing the boys more than girls					
16	Teachers are always suggestive to motivate girls student to study mathematics.					
17	It is difficult to ask the problem which has not been understood.					
18	I like to solve basic mathematical problem with my friends.					
19	The basic math teachers teach regular in the class.					
20	I feel difficulty in reading mathematics key words or symbols.					
21	I feel hard to comprehend the overall meaning of mathematics.					
22	I myself have no trick to solve any problem of Mathematics.					
23	I need the help of teachers to solve any problem of					



	mathematics.					
24	I cannot find myself the wrong of any mathematics question.					
25	I always make mistake in solving the problem.					
26	Our society unequally treats boys and girls.					
27	There are literate people in our society.					
28	Female have inferior place in our Society.					
29	Low role and opportunity of girls in society.					
30	Our society has no idea whether the subjects' matter of mathematics is good or bad.					
31	The society and persons admire the girls in learning mathematics.					
32	The society does not inspire girls to learn mathematics.					
33	All the teachers and students help to study mathematics.					
34	My parents always say me that do not spend more time in mathematics at home.					
35	I think mathematics is boring subject					

Thank you very much for your assistance in completing this opinionnaire as well as my research.

## Appendix - B

### Interview Guideline for Teacher

Name of teacher:- .....

Qualification: - .....

Trained/untrained: - .....

Teaching experience:- .....

Address:- .....

..... VDC / Municipality      Ward no.:- .....

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

### Interview questions for teachers

What do you think about the qualities of female students in mathematics classroom?

How competent female students are in coordinating, promoting ,communicating and participating in mathematics learning?

In what ways do the female students show interests on mathematical activities?

How does their enrolment in maths learning influence other girls in teaching and learning mathematics?

In what way is the participation of female student different from that of male student? Why do you think so?

What are supporting/prohibiting factors that help/do not help them to participate in mathematics learning?

How does the behavior of the teachers affect female students for learning mathematics?

Why do you think female students do not seem interested to involve in mathematics classroom?

Is there any role of their classroom environment?

Why are female students less interested to actively participate in maths classroom?

How can we promote participatory learning for girl's students in mathematics education?

How can you co-operate your female students to support their mathematics learning?

How could be the role of teacher to motivate their children ( female )for mathematics classroom?

**Appendix-C**

**Statistical Formula**

1. The computation formula used for the calculation of  $\chi^2$ -test was

$$\chi^2 = \frac{(O_{ij} - e_{ij})^2}{e_{ij}} \text{ where, } O_{ij} = \text{Observed frequency}$$

$e_{ij}$  = Expected frequency

$$\text{And } e_{ij} = \frac{i^{\text{th}} \text{ Row total} \times j^{\text{th}} \text{ column total}}{\text{Grand total}}$$