

TRIBHUVAN UNIVERSITY
UNIVERSITY CAMPUS
CENTRAL DEPARTMENT OF EDUCATION
DEPARTMENT OF MATHEMATICS EDUCATION
KIRTIPUR, KATHMANDU
NEPAL

Letter of Approval

A

Thesis

By

Gayatri Kumari Pant

Entitled

"CAUSES OF LOW ACHIEVEMENT IN MATHEMATICS OF GIRLS STUDENTS"

has been approved in partial fulfillment of the requirement for the Degree of Master of

Education

Committee for viva-voce

Signature

1. Prof. Dr. Lekhnath Sharma

.....

(Chairman)

2. Prof. Dr. Hari Prasad Upadhyay

.....

(Member)

3. Mr. Abatar Subedi

.....

(Member)

Date :

Letter of Certificate

This is to certify that Ms. Gayatri Kumari Pant, a student of academic year 2067/68 with campus Roll No. 1544, Thesis No. 933, Exam Roll No. 281363 and T. U. Registration No. 9-2-404-83-2006 has completed this thesis under my supervision during the period prescribed by the rules and regulations of Tribhuvan University, Nepal. The thesis entitled **“Causes of Low Achievement in Mathematics of Girls Students”** has been prepared based on the results of her investigation conducted during the period of 2069-2070. I hereby recommend and forward that this thesis be submitted for the evaluation as the partial requirement to award the Degree of Master of Education.

.....

(Mr. Abatar Subedi)

Supervisor

.....

(Prof. Dr. Lekhnath Sharma)

Head

Date:.....

ACKNOWLEDGEMENT

I want to express my heartfelt gratitude to my respected supervisor Mr. Abatar Subedi, Department of Mathematics Education, Central Department of Education, Kirtipur, Kathmandu. His valuable and constructive suggestions, instructions and scholarly guidelines have become the greatest property in this thesis, without his constant supervision and intellectual guidance it would never have been appeared in this form. Though, I haven't found any such word to express my deep gratitude to him for his kind help. So I'm heavily indebted towards to him.

I would like to extend my gratitude to my respected teacher Prof. Dr. Lekhnath Shrama, Head, Department of Mathematics Education, T.U., Kirtipur for his valuable comments and suggestions that led me to accomplish this thesis. Similarly I am very grateful to my respected teacher Prof. Dr. Hari Prasad Upadhyay and all my respected teachers of the Department of Mathematics Education who directly or indirectly encouraged me to complete my thesis. I would also like to extend my heartily thanks to all students, parents, subject teacher and head teacher of Janaki Girls Higher Secondary School for their kind co-operation in data collection.

Finally my heartily honor goes to my parents for their guidance for my career. My sincere thanks goes to my brother Bishnu Datt Pant for his contribution to make this study better and valuable.

.....

ABSTRACT

This is a case study related to causes of low achievement in mathematics of students of Janaki Girls Higher Secondary School. The objectives of this study were to find the causes of low achievement in mathematics of Girls School and to find out the ways of using materials, strategies and procedures for mathematics learning. It is a case study and qualitative in nature. This study was conducted with the ten respondent students of grade X. It was chosen, purposively, according to the performances in mark obtained by the students in 2069 of Janaki Girls Higher Secondary School, Kanchanpur. Direct interview with students, corresponding parents, subject teacher and head teacher were taken. Classroom observation was done regularly for two weeks during teaching learning activities being participant with math teacher and students. Thus, collected data were analyzed with the help of theoretical framework developed by researcher.

The finding of the study show that the traditional type of exercise in teaching learning activities was the one of the causes of low achievement. There was no proper interaction between teacher and students. The school's policies were not sufficient to address low achievement. There were communication gap between teachers and parents. Girl's participation in learning mathematics were low. This study clearly showed the gender suppressions, weak financial conditions, non-educated family, poor instructional condition of the school, irregularity of students in class, lack of teaching learning materials, bad home environment, lack of student oriented teaching learning environment and no initiation

towards the development of students personality on discussion, interaction, class works are the causes of low achievement of girls students in mathematics.

Chapter I

INTRODUCTION

Background of the Study

The knowledge of mathematics is an essential tool in our society (Baroody, 1987). It is a tool that can be used in our daily life to overcome the difficulties faced (Bishop, 1996). Mathematics has been considered as one of the most important core subject in a school curriculum. More mathematics lessons are likely to be taught in schools and colleges throughout the world than any other subject. However, the standard tests and evaluations reveal that students do not perform to the expected level. The student under achievement in mathematics is not just a concern for particular countries, but has become a global concern years (Pisa, 2003). This study concerns with mathematics which is related to gender based learning that why the girls have low achievement in mathematics and which factors are responsible for their achievements and their under achievements.

Gender difference in learning mathematics continued to attract researcher in recent years. Women's education has very short history in many countries. Differences in educational opportunities available from male and female are clearly illustrated literacy rates of male and female of different societies. The effect of gender difference in education is visible in literacy rate of our society. Subsequently, the question of gender equality in mathematics education is complex issue. Although boys and girls take the same courses and

read same text book of mathematics in schools, there is significant difference in their achievement. Gender parity in formal education can be sensed in terms of literacy rate of male and female. In the case of Nepal (statistics pocket 2011) literacy rate of female is 57.4% where as male literacy rate is 75.1%. This kind of difference shows one instance of unequal access to educational opportunities to male and female in the country. Earlier studies have proved that some of the social variables such as social system, culture customs, economic condition and traditions affect gender equity. Gender disparity in access to education begins from the home in the Nepalese context.

According to recent reports, the Nepal Living Standards Survey 2010-2011 (NLSS- III) has found out that Nepal has an adult literacy rate of 56.6 percent with a huge variation between men and women. While male literacy rate is 71.6 percent, it is only 44.5 percent for women. According to the Education for All Global Monitoring Report 2011, out of 7.6 million adult illiterates in Nepal, 67 per cent are female.

Females are very backward in comparison to males in respect of education development. There are many causes of backwardness of females among them, social factor is one. Females have not got educational and socially equality for a long time. That is why: they could contribute more in the field of education as well as in area of mathematics education too.

Basically it is believed that men and women are the two sides of the coin. There is no doubt that two sides of the coin are equally important but the women are being unable to take as equal partition as of men, there are instances of gender disparity in every day practice in society. The society is not behaving men and women equally. Even the parents do not behave equally to son and daughter. It is because the Nepali society is basically patriarchal. It needs

the justice or equal behavior among the male and female characters in the society. The equal behavior is important to empower the male and female in the proportional way. Parent's beliefs and attitude towards education can influence on mathematical thinking and attitude of their daughters. Literacy or educational status of the parents lays the crucial role to make positive or negative thinking on their daughters learning of mathematics.

S.L.C. Result of Janaki Girls Higher Secondary School of Kanchanpur district

Years	Total Students	Passed Students	Passed in Mathematics	Failed in Mathematics	Failed % in Mathematics
066/67	20	12	12	8	40%
067/68	18	11	11	7	38.89%
068/69	29	10	10	19	65.52%
069/70	34	7	19	15	44.12%

In the context of Kanchanpur, in government school passed percentage of students was found to be only 23.65%, which was very poor result. Amongst the failed student, most students were found to be failed in mathematics and those were mostly amongst girls' students. In Janaki Girls Higher Secondary School of Kanchanpur district only 7 students were passed and 27 students were failed from 34 students in the SLC of the year 069/70. Among them most students were found to be failed in mathematics. In Janaki Girls Higher Secondary School, 29 students get marks under 50 (below average) and only 5 students get marks above 50 (above average) but no one can get the first division marks in the subject mathematics. This type of result shows that low achievement of student in mathematics in Janaki Girls Higher Secondary School of Kanchanpur district.

In the context of Nepal, girl's participation is low in school, and those who participated are not participating in mathematics classroom. Girls who are participating in mathematics

classes, they are not able to participate in learning mathematics because of various kinds of social factor and family problems. Due to this, there is low achievement of girl's student in mathematics. The aim of this study is to improve the Girl's achievement in mathematics. Why girl students don't want to read mathematics? Why they detach from mathematics? What are the difficulties in learning mathematics of girls? Why the girls have low achievement in mathematics? Thus, present study proposed to find out the causes of low achievement of Janaki Girls Higher Secondary School.

Statement of the Problem

This study is related to the causes of low achievement of students in mathematics in secondary level of Janaki Girls Higher Secondary School. So the study of causes of low achievement in mathematics at secondary level of Janaki Girls Higher Secondary School has been considered as a case study. Achievement in mathematics is affected by various factors like home and school environment, physical facilities, attitude towards mathematics, peer groups discussion, discussion with senior, interaction with teacher, teaching learning materials and process, economic status of parents etc. Thus for improving mentioned factors and then minimizing low achievement in mathematics or get the more achievement in mathematics in secondary level, it is considered as a researcher research topic. The statements of the problem of this study as following:

- Why the students have low achievement in mathematics in Girls School at secondary level?
- How the materials, teaching learning strategies and procedures are used in learning mathematics in Girls School at secondary level?

Objectives of the Study

The main objective of this study is to identify the causes of low achievement in mathematics at secondary level. The following objectives were designed for this research study:

- To find the causes of low achievement in mathematics of Girls School.
- To find out the ways of using materials, strategies and procedures for mathematics learning.

Significance of the Study

Researcher had tried to investigate and find out the causes of low achievement in mathematics of Girls School at secondary level. The significance of the study is pointed out in the following:

- This study would help to improve mathematics achievement of girl students and it would provide useful tips to improve the mathematics learning.
- This study would help to mathematics teachers to do effective teaching in classroom by using teaching materials while teaching mathematics, since this research helps in understanding the reason behind low achievement of girls' students.
- This study would help to minimize failure rate in mathematics at secondary level of girls' students.
- This study would be helpful the parents, teachers, students with aware of the responsible factors of the low achievement in mathematics at every level.

- This study would help the policy makers, educators, administrators, and teachers to improve the teaching learning procedures.
- This study would help further research in the areas of causes of low achievement in mathematics.
- This study would be helpful for curriculum designers to design the curriculum accordingly to the need, level and ability of learners.
- This study would be helpful for students to be aware of the main problems of the mathematics to adopted required strategies for the improvement.

Delimitation of the Study

Each study has not rigorous, perfect and free from limitation. They have some sort of limitations. On the other hand, they can't overcome the problems of every field. Thus this study also has some limitations, which are pointed below.

- This study was limited only one Janaki Girls Higher Secondary School of Kanchanpur district.
- This study was limited only to causes of low achievement of girl students in mathematics at secondary level in Janaki Girls Higher Secondary School.
- This study was limited to only ten girl students of grade X and causes related to school, home and individuals.
- The study was based on qualitative analysis so advanced statistical tools were not applied.
- This was a case study and the case school was selected in accordance with researcher convenience. The result of the study can be no more generalized.

Definition of the Related Terms

Girls School: A government school, Janaki Girls Higher Secondary School of Kanchanpur District.

Subject teacher: A person who teach mathematics at secondary level in Janaki Girls Higher Secondary School.

Student: The students who are studying mathematics at secondary level in Janaki Girls Higher Secondary School.

Participation: Refers to the girl's participation in learning mathematics in terms of homework, class work, interaction with teachers, peers group interaction and library.

Causes: According to oxford Advanced learning dictionary (2010) defines the causes as the person or thing that makes something happens.

Low achievement: Low achievement is a condition in which students cannot obtain fifty percentage marks (obtain below average) on the examination.

Chapter II

REVIEW OF RELATED LITERATURE

This section presents the review of the related literature of this study and theoretical framework of the study. The related study provides the researcher in making her problems more realistic, precise, researchable and meaningful. In order to get a better understanding of the subject of one's study, it is essential and helpful to survey the literature and study relevant and related to it. Bearing these advantages in mind, the researcher reviewed several studies. Some of them are given below.

Empirical Literature

Children's participation and continuation on education depend upon parent's attitude towards education. How children continue their education is totally dependent upon the attitude of the parents. When parent realized the need of their children's education, this is the opportunity to the children in education. Both father's and mother's ethics affects their children to improve their personality (CERID, 1990). The previous researches have shown that children's education can be affected attitudes towards education, parent's education and income has direct positive influence on scholastic achievement of students (Mathur and Hardill, 1972). There is positive correlation between attitude towards mathematics and

achievement but differs by sex. The main attitude score of boys towards mathematics as school subject was greater than that of female students (Pandit, 1984).

Ghimire (1997) studied on the topic 'Factors affecting teaching and learning mathematics at secondary level' with the objectives to explore the factors affecting of school mathematics in terms of school environment, family background, motivational factors. The tools for the study were administered to the sample of 90 students and the data was analyzed by using t-test. He concluded that environment of the school in rural and urban areas affect equally but the boys are more affected than the girls are. Likewise environment affect more to the subject of rural areas and girls are affected more than boys. He was also finding out that motivation, student's interest, instructional methodology and materials also affect on the teaching and learning mathematics.

Janwali (2007) studied on the topic "causes that affect mathematics achievement of girl's students" and determine the correction between affecting factors and mathematical achievement. The researcher adopted the survey method in this study. The sample of the study was determined by convenience sampling from Rupandehi district. Researcher selected 25 sample students from different school of this district situated in rural and urban area. In this study one set of questionnaire was developed and three point likert scale for the convinces of the respondent were developed for the collection of needed information which was used for students. The conclusion of this research work was effective classroom teaching such as planning environment, less use of instructional materials, appropriateness to teaching participation on discussion, activity have strongly positive effect on mathematics achievement of girls students. It concludes that the effective classroom teaching is very essential for increasing the mathematics achievement of girls' student so it should be

improved. The teacher behaviour and family background are also have positive effect so that the teacher and parents have equally responsible for the girls' students learning activities in school and create good environment at home for learning and improve the mathematics achievement of girl students.

Luitel (1997) has done a research in the title 'A study of attitudes of secondary school students towards mathematics and its relationship with their achievement in Mathematics'. He used random sampling to select 150 students and the achievement test prepared by the school in final exam and applied t-test as well as correlation to analyze the data thus collected. He also found that all coefficients of correlation between achievement and attitude of secondary school students (measures of attitudes towards mathematics) were significant.

Tiwari (2002) has reported that both farmer and non-farmer parents had positive attitude towards the school mathematics, farmer and non-farmer parents had positive attitude towards their male child and female child about the school mathematics. However, educated parents had positive towards daughter's education rather than non-educated parents.

Subedi (2005) did a study on 'Factors affecting failures in mathematics in SLC examination' with the objectives to measure the effect of school and out of school contextual factors in mathematics achievement to determine the correlation between affecting factors and mathematics achievement. So students were selected through the purposive sampling of eight schools in Sarlahi district. Questions were used to collect the data of this study. Mathematics achievement of failure students are strongly positive correlated with the school environment effective classroom teaching and time variable which is significant, the teacher's behavior, peer's behavior, interest of learner and motivation with occupational goal are low

positive correlated with the achievement of mathematics. School environment is an important causing agent on the failure of mathematics achievement.

Dhakal (2006) did a research in ‘The factors affecting the girls students attitude towards selecting optional mathematics at secondary level. 100 students were selected from Syangja district who had offered the optional mathematics course in secondary level. This study concludes that eight variables; which are teachers’ behavior, prior achievement level, and job taking mission, plans of further study, parental support, social influences, peer influences, self confidence and girls’ interest come out to be true in the context of Nepal influencing the girls to make positive attitude mathematics learning.

Sapkota (2011) studies on “cause of failure in mathematics at school” of a public school in Lalitpur district with the objective to find the cause of failure in mathematics at secondary level and to identify the strategies taken by the school in improvement of mathematics achievement. This research design was qualitative as well as descriptive in nature. The respondents of the case study were students, corresponding parents, teacher and head teacher. From the case school six low achiever students including three boys and three girls were selected according to different family background and performance in mathematics examination. To collect the primary and secondary data school documents, observation note and interview guideline were used. The result of this research was classroom practice and the curriculum was closely linked. Achievement of students is always affected by different variables such as schools learning environment, facilities at home, classroom environment, school policies, mathematics instruction, assessment at classroom and so on.

The socio-cultural factors influence girls’ student performance and participation in mathematics. Society has the attitude that the girls student’s do not perform well in

mathematics. Mathematics performance and participation in girl's student in complex pattern into the fabric of society's expectation such attitude of society girl students directly as well as indirectly in participating the mathematics (Fenneman and Sherman, 1977, 1978, Schonberger, 1978).

Sex role theory shows that being biologically different boys or girls do not affect in mathematics achievement. According to this theory the difference between boys and girls are created by our society and culture. They conduct the role of man according as biological differences. Society believes that girls cannot have good mathematics achievement so it is better to take other non-math subject as optional. Due to the lack of confidence, girls are weak in mathematics. Interest of reading mathematics in future blows away. Therefore, they are not motivated towards mathematics related job. As a result, they do not dare to take optional mathematics.

From above review, there have been many researches on achievement study of different ethnic groups, factors affecting learning mathematics and causes that affect mathematics achievement. From which the researcher has found that there are many factors such as culture, physical facility and home environment, teaching learning process, motivation, and teacher interaction are the influencing factors in learning mathematics.

Theoretical Perspectives

There are so many theories which can be used to understand the learning process. The theoretical discussion is needed for the interactive finding of the study. Many theories about learning and development of children such as cognitive, behaviorist, humanist, social

constructivism of which constructivism is one of the theories to analyze and interpret the data of mathematics of resolve the problem. To analyze and find the suitable solution in the area of low achievement in mathematics; constructivism becomes one of the possible theory to solve the problem on the topic of “causes of low achievement in mathematics of girls student” (a case study of girls student). Every student learns from society from social contact with home family and universe. According to them, knowledge can be constructed from society. This kind of thoughts can be given by constructivism.

Constructivism

Constructivism is related to educational theory to deal with the problems of mathematics. It helps to find out the problem of low achievement in mathematics. It is the theory based on observation and scientific study to deal the problems of learning. It asserts on forming the understanding and knowledge of the word through experiencing things. When we encounter something our mind perceives the things and reconcile with pre exist idea. It means our mind becomes active creator to reach and act with present surrounding. In the similar way constructivist idea of learning can point towards number of different teaching practice. It encourage the students to involve themselves activity and used techniques of learner centered, group work discussion, learning by doing, use outside tools to be more practical and gain high achievement in mathematics rather than classroom it focus on real life learning environment, social interaction and use of complex idea share with other outside of classroom easily. Constructivism transforms the students from passive receipting of information to

active participation in teaching process. Constructivism based on three axioms that are as follows.

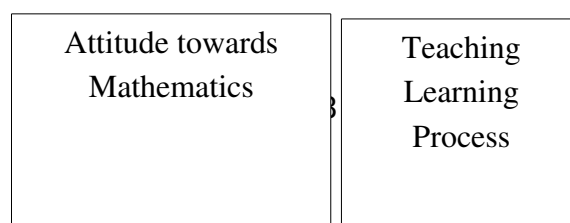
- Learners gain knowledge from their active participation.
- Learners gain knowledge while reflecting on their own action.
- Learners gain knowledge when they try to convey their solution to others.

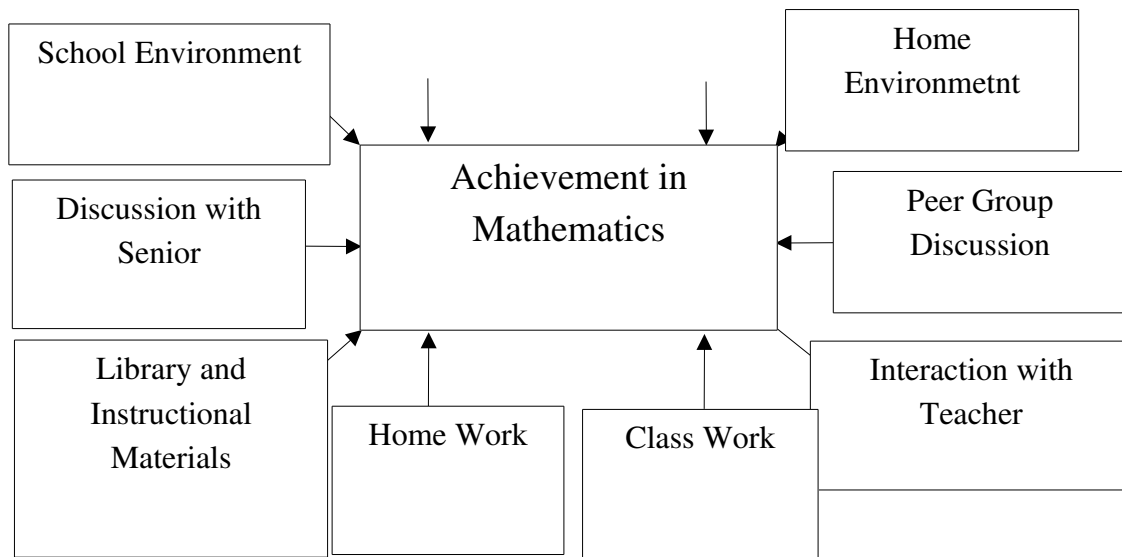
From above axioms Upadhyay (2001) took three terms action, reflection and scaffolding to describe three broad aspects of constructivism, psychological aspect, philosophical aspect and sociological aspect. Piaget stresses on the key word “action” though which he advocates that knowledge is gained. He said that essential way of knowledge is not directly through our sense but primarily through our action. Philosophical aspect of constructivism is also called radical constructivism which is led by Glasersfeld who advocates as social constructivism led by Vygotsky who states that knowledge is socially constructed.

Conceptual Understanding

A conceptual framework is made to find out the causes of low achievement of students in learning mathematics of Janaki Girls High School which deals directly or indirectly to school environment as well as their parent education, family background. Low achievement of girl students in learning mathematics may depend under different variables. Those variables are shown in the following framework.

Figure: Conceptual Understanding in Learning Mathematics





Sources: Pandey, T.R. (2008) & Regmi, A. (2012)

This research tries to test the above model by interview and observation to find the causes of low achievement in mathematics at secondary level of Janaki Girls Higher Secondary School. Hence this is the major theoretical base for this study. The above model is developed by the researcher from the help of related literature, previous thesis and supervisor. This study was mainly based on the above researches and already explained theory of social constructivist for mathematics learning which focus on socially constructed knowledge. An achievement is always affected by different variables such as school related, home related as well as personal factors. This case study explains and interprets how the proposed elements work for mathematics achievements.

From the above researches it can be seen that girls influence variables in learning mathematics are attitude towards mathematics, school environment, home environment, peer

group discussion, teaching learning process, class work, library and instructional materials, family background, discussion with senior, homework and interaction with teacher.

Chapter III

METHODS AND PROCEDURES

This chapter presents research design, selection of respondents, data collection instrument, data collection procedure and data analysis and interpretation procedures.

Research Design

Research design is the way and path of the research that guides the researcher to reach the goal of the research. Its main importance is to help researcher to collect data, interpret and analyze it. The study is designed as the case study, related to causes of low achievement in mathematics of girl's student, which is qualitative and descriptive in nature.

Selection of Respondents

The research in mathematics education has shown that, mathematical achievements amongst girl students were found poor throughout the nation. Mainly girl students of public schools were found this majority. The researcher selected only one public school of Kanchanpur district purposively to achieve the objectives of this study. The researcher selected Janaki Girls Higher Secondary School which is located in western part of this district. Researcher selected this school because this school has problem of low achievement in mathematics of girl's students so this school is very suitable for this topic.

The respondents of this study were low achiever students in mathematics and the corresponding parents, math teacher as well as Head Teacher of the case school. Ten low achiever students from case school were selected according to different family background and performance in mathematics examination.

Data Collection Instruments

Researcher used three types of instruments in this study. They are observation form, interview schedule and document analysis.

Interview Schedule

Based on objectives of the study the researcher had taken the interview with the selected students, mathematics teacher, head teacher and corresponding parents to collect primary data. The researcher had made the interview schedules to fulfill the research objectives and to meet the conceptual framework of the study. Four types of interview schedule were prepaid for study. The interview schedule was semi-structured in form.

Observation Form

The class observation form was developed to assess the participation and the performance of the respondents. The researcher evaluated the attendance and activities of the students and teacher by using observation form. The observation was done by setting in the classroom where researcher could watch, listen, interact and record the essential data from the subjects.

Document Analysis

Document like students' register, their mark sheets, school result sheet and teacher's profile were taken out to derive information to this study. The researcher evaluated the regularity of the students from the students register. The researcher evaluated the mathematics achievement of the students from their mark sheets and school result sheet.

Reliability and Validity of Tools

Cross match was adopted to maintain the validity and reliability of the results of the study. The researcher also tried to ensure the internal reliability and validity by observing the

same phenomenon repeatedly by clarifying his biases and by the help of expert and supervisor.

Data Collection Procedure

The researcher collected data and information by using interview schedule and classroom observation form. The school record was studied such as mark ledger of the school, student's physical facilities, student-teacher profile and other relevant documents. The interviews were taken to the low achiever student in mathematics, corresponding parents, teacher and head teacher. All replied noted during the course of interview. Most of the socio-economic information, literacy or education status of parents and information about home environment was retrieved from the interviews from the parents. Two weeks of class observation was done for the qualitative data. The researcher had observed the respondents' class in those days. Based on observation form, the researcher had observed the behavior and activities of both low achieved students and corresponding teacher during teaching learning activities in mathematics classroom. On the observation note the participant of the students, attendance of the students, their homework assignments and their performance in the subject, their difficult in learning, problems of the teaching learning, use of teaching materials, procedures, strategies, class management and the whole environment of the class room were carefully noted. All of the information was reviewed through second interview and other secondary sources like school report, case study of "women and social justice" of Kanchanpur district.

Data Analysis and Interpretation

The collected information from class observation, interviews and schools records were first categorized according to the category of the respondents and then different themes were given in the text of interview schedule and observation form. These themes were considered as a code. Similar code versions of the respondents were collected together and explained in their perspectives. Cross match was adopted to maintain the validity and reliability of the results of the study. The researcher has also tried to ensure the internal validity by observing the same phenomenon repeatedly by clarifying his biases. Data analysis and interpretation was done on the basis of theoretical framework developed by the researcher in the literature review.

Chapter IV

ANALYSIS AND INTERPRETATION OF DATA

This is the case study related to find the causes of low achievement of girl's student in mathematics. The objectives of this study were to find the causes of low achievement in mathematics of Girls School and to find out the ways of using materials, strategies and procedures for mathematics learning. The respondents of this study were the girl students and their parents, Head Teacher and the mathematics teacher of grade X of the Girls School. The main tools used for this study were interview guidelines, observations forms and related school documents. The researchers took suggestion from the subject expert, specialist and supervisor to establish the reliability and validity of tools.

This chapter deals with the analysis and interpretation of the data collected by the researcher in the Kanchanpur district exclusively in the periphery of Shree Janaki Girls Higher Secondary School. The sample of the study was determined by purposive sampling from grade X. The researcher has taken ten key girls students to collect the data. Based on observation form, the researcher had observed the girls and teacher activities on teaching learning in the class room. The school environment and other details were obtained by observing school environment and interviewing with the head teacher, subject teacher as well as document analysis of the school. The home environment and other details were obtained by taking interview with their parents and analyzed in the descriptive manner. This chapter has been done under the following ten thematic divisions:

- Interaction with teacher
- Peer group discussion
- Discussion with senior
- Homework
- Class work
- Library
- Teaching learning process

- Home environment
- School environment
- Attitude towards mathematics.

Before the analysis obtained data the researcher explained here about the case respondents. Case respondents of this study were taken from different communities in the periphery of Shree Janaki Girls Higher Secondary School. The focused area was socio-economic status of the students' family and those barriers which are responsible to get better education. Each case of respondents was analyzed. Information was retrieved through observation and interviews.

The first respondent A of this study was from Mahendranagar, Aitpur ward no. 6. She is now 16 yrs old and lives with her parents, two sisters and one brother. There are six members in her family. Her father and mother are farmers. Her economic status is poor. She was working on the field near her house when the researcher visited her. She has to do most of the household works before she goes to school. After she wake up in the morning she has to do fetch the firewood and grass for the cattle, cook the food for the whole family, to care the little younger sister and to hold the another sister to make to go to the school. She always tries to help her parents to making money. In last year result of grade IX, she obtains just third division marks in mathematics. She had very little time to complete her homework. Though mostly she makes it complete. However, she has no time to do any practice. She has scheduled almost all three hours for everything to do her class works at home. She does hard work when she gets the time. She has not felt any notorious remarks from her parents for her study. She feels mathematics is a hard subject.

Respondent B was born in Mahendranagar, bazar ward no. 4. She lives with her parents, two brothers and one sister. There are six members in her family. Her father is

businessman, he works in soap and her mother is house wife. Her economic status is good. In grade IX, she obtained just third division mark in mathematics. She likes the set, profit and loss chapter in mathematics and all other chapters she feels difficult like mensuration, roots and surds etc. She gives more time to household work and she was irregular in school.

Respondent C was born in Mahendranagar, Bhasi ward no. 1. She is 16 years old. She lives with her parents and three brothers. There are six members in her family. Her father is shopkeeper and her mother is house wife. Economic status is medium. She gets third division mark in mathematics in grade IX. She watched TV much. She gives more time to household work and to television. Her parents did not support her to study mathematics. She didn't like the subject mathematics

Respondent D was born in Mahendranagar, Bhagatpur, ward no. 4. She lives with her father, mother and her sister. There are four members in her family. Her father is shopkeeper and mother is house wife. Her economic status is medium. In grade IX, she obtained just third division mark in mathematics. She didn't feel supportive environment at her home for study mathematics, she complied 5-6 hours in household work. She didn't like mathematics teacher because she thinks teacher only gives focus to talent students, not seem to poor students, teacher does not care about future of students and she didn't satisfied the teaching methods that math teacher is used.

Respondent E was 16 years old. She has born in Mahendranagar, Tilakpur ward no. 3. Now she lives with her family in the same place where she was born. She has five members in her family. Agriculture is the main occupation of her family. Her economic status is medium. In grade IX, she obtained second division mark in mathematics. She feels interesting to solve mathematical problem. She has no hesitation to ask teacher and friends on

subject matter. Her home environment was not so good, she think her mum dad are responsible for it.

Respondent F was born on Mahendranagar, Goberiya ward no. 15. She lives with grandmother, father, mother, two brothers and six sisters. Her family is very big family. There are 12 members in her family. Her father is businessmen and her mother is house wife. In the morning she prepares the breakfast for the family members and she take a seat for an hour. At 9:30 am she goes to school. She is not more interested in mathematics, because she knew it is difficult than other subject for her. Her mathematics practice is irregular. Not only mathematics her textbook reading in home is irregular. So in last year result of grade IX, she had obtained third division marks in mathematics. She feels bored to study mathematics; she gives more time to other subject. Her father is well educated so he always supports to her to study mathematics but he can't give time to children's to teach mathematics because of business, she feels her culture effect in learning mathematics, she also compiled in household work.

Respondent G was 17 years old. She was born in Mahendranagar, Katan Ward no. 18. Her father is businessman and her mother is house wife. She has two sisters and one brother. There are six members in her family. Her economic status is good. She always gets up before 6am in the morning. She starts to make breakfast. At the 8:30am she always has to start prepare food. She feeds her brother and sister around 9:15-9:30 am and prepares them and herself for the school. In last year result of grade IX, she obtained just third division marks in mathematics. She has not sufficient time to read at home. She has the responsibilities to care her youngsters because her mother can't pay more time to them because her mother also helps to her father on the business. She feels mathematics hard. She always doubt with this

subject in the school and examinations. She can't recite the formulas because she has not sufficient time to pay attention on this. Her seniors are not at her home who can guide her on this subject and create the favorable environment, understand her to do practice, she never went to tuition classes and coaching classes, she goes home earlier from the school than her friends and sometimes she skip the classes.

Respondent H was born in Mahendranagar, Tilakpur, ward no. 3. She lives with her parents, two brothers, two sisters and grandmother. There are eight members in her family. Her father is worked at government job and mother is farmer. Her economic status is medium. In last year result of grade IX, she obtained just third division marks in mathematics. She feels her culture effect in her study, mainly menstruation period is effect on her study because in this period she sleep in another room, she can't go to her reading room and bed room but her copy and books are there. So she can't study those books in that period because of her culture. Also she gives much time in household work; environment of home is not so good.

Respondent I was born in Mahendranagar, Salghari, ward no. 18. Her father has laborer. He did everything such as sometimes he pulls the rickshaw, sometimes he ploughs and sometimes he works on constructions. But now-a-days her father and mothers was not live in this world, now she lives with her brother and two sisters. There are five members in her family. In spite of poor economic condition, the respondent got the secondary level education for the first time among the family members. Her family earns just less than five/six thousands rupees monthly. So she has not enough money to expense for tuition classes. She never gets good inspiration from the family to do well in mathematics. She herself does anything she has to do. She is not so far good in mathematics. She had obtained

just third division marks in mathematics in grade IX examination. She feels difficult in geometry. Sometimes she asks with the subject teacher to solve difficulties. Her first unfavorable subject is math, She wish to get a graduation by doing hard work. She wants to get out from the poverty in future.

Respondent J was born in Mahendranagar, Bhagatpur ward no. 4. She lives with her father, mother, grandmother, one brother and one sister. There are six members in her family. The main occupation of her family is agriculture. Her economic status is medium. In last year result of grade IX, she obtained just third division marks in mathematics. Her home environment is not good for study mathematics. In her family no seniors are school educated. They can't teach and motivate her to do mathematics and can't favor her to create the home environment for practice. She tries to do homework better but sometimes she asks to help from the friends so that she can copy and submit to the class teacher.

From the above case studies, researcher had made some conclusions. Such as, poverty factor is playing crucial role to backward the students and suppressing their positive psychology to earn better education. The education status of the family, lack of good motivation and student oriented teaching learning environment and burden of domestic works had seen the major factors to hinder to get good achievements of the students.

Low achievement in Learning Mathematics

Low achievement of girl students in learning Mathematics was explored with the help of class observation, interview with student, mathematics teacher, parents, head teacher and

school documents analysis. The data collected through different tools was categorized and analyzed with the help of conceptual framework under different subheading.

Interaction with Teacher

Interaction is to communicate with somebody, especially while in the work or teaching learning activities. It is a social activity and all the human continuously get the any of interaction since human is the phenomenon of the society. Teacher- student interaction is the engage to know or to understand the subjects to encourage students them into investigate and solve mathematical problems by discussing each other and with the teacher.

In this case study, first of all, the researcher had assessment in the classroom teaching learning activities of the subject mathematics to evaluate how the teacher interacts with the student? Moreover, is the participation of the girls' student is satisfactory or not? The one episode of classroom activities was as follows:

The teacher had entered in class with a textbook and marker only. He hadn't any kinds of teaching learning materials to be showed to the students or to be displayed in the classrooms. He wrote the topic "ghatank (indices)" on the whiteboard and started to teach. He did not review previous lesson. He had done two questions on the board and go to the office. After 15 min he come to the class and asked the students whether they understood. One of the girl students said that she could not understand completely. The teacher become angry and warned her- "If you say again like this you will be punished; you must be serious to learn and understand the lesson from my teaching." Most of the students did not seemed afraid with the teacher and class in very noisy but them afraid and hesitated to ask the questions to the teacher. Students could not raise their hand to ask any questions to the

teacher. In addition, the teacher did not try to understand them properly whether they comprehend the lesson or not. The teacher even did not go up to the backbenchers. He just made the students remind the formulas and ask them to recite at any rate. One of the girl students asked the teacher if there is example to be comprehended the formula easily. He did not care much her but he told her to see the textbook and find herself. The teacher said the students to do remaining exercise as the homework assignment and he said the class was over.”

The above response shows that the classroom is teacher dominated and student's oriented class was totally deductive. The cooperation between teacher and the students couldn't be established. Social constructivism theory emphasis on the teacher should work as a facilitator in the classroom but not transmitter of knowledge, teacher should help the learner to get to his or her own understanding of the content, teacher should provides guidelines and creates the environment for the learner to arrive at his or her own conclusions. But in case school it couldn't found.

Thus it is concluded that there is no proper interaction between teacher and girls students. The interaction in mathematics classroom between teacher and the students may be of different types; such as; inquiry of the problem- solving process, inquiry of new concept, whole-class presentation, and practicing problem solving investigations or projects etc, any of these approaches couldn't be seen in the observed classroom. Thus, obviously that is one factor creating the difficulties to achieve the desired expectations or achievements from the mathematics classroom.

Peer Group Discussion

Peer group is a group of people of the same age or social status. Peer group discussion means the discussion among the students of the grade X of the school. An assessment had been done to analyze the girls' participation in Peer group discussion. Peer group discussion is associated with small group discussions among peers in terms of developing general problem-solving skills, building positive social relations and developing discourse practices integral to mathematics. This study observes peer group discussion if they are doing and the patterns of interaction among a small group of classmates while they engaged in mathematical discussions or the impact of teaching learning if there is no Peer group discussion at all.

Researcher asked the subject teacher- *"Why you haven't conducted any peer group discussion?"* Teacher replied, *"Peer group discussion is not effective in my class because very few students of my class are active. They don't want to take part in social activities. But they seemed to like recite the lesson as I should have instructed them. If I ask them to discuss on the lesson they don't discuss but they start to see their face each other. So I have been instructed them to recite and comprehend the lesson."*

The above response shows that the role of the students was passive and class was totally dominated by the teacher. Social constructivism demands that the learner should play an active role in the learning process. It also emphasis on more students centered approach in classroom. But the case school hasn't adopted this approach in classroom teaching.

Thus it is concluded that there is no peer group discussion. Teacher should applied student centered approach for effective teaching learning activity and betterment result.

One of the students view was as this- *"I always afraid to speak in front of others. I feel ashamed to do so because I always doubt in my performance. If I do mistaken and errors my friends laugh at me and teacher also scolds me. I wish I never deliver any speech. But I do feel better to do my tasks silently."*

This response shows that there is lack of active participation between student-teacher and student-student. Social constructivism demands that learners gain knowledge from their active participation and they gain knowledge when they try to convey their solution to others. But it couldn't found in case school.

Thus it is concluded that active participation should be compulsory for effective performance of students.

The researcher had gone to the headmaster to ask about the provisions or structured teaching learning if any there being adopted in the school. The version of the headmaster was as this- *"We have to finish our courses in time. I always encourage the teachers not to leave any chapters of any textbook one month before the examination so the students can repeat their lessons properly. Teachers say that to do so they have to make their lessons fast. Simply, they don't have time for peer group discussion because it takes time longer."*

The above response shows that they are being taught forcibly. Recent traditions on mathematics education emphasize that learning to communicate about and to communicate through mathematics are key components of developing mathematical competence. This communication is really a peer group discussion. But the case school hasn't adopted this approach in classroom teaching.

Thus it is concluded that there is no peer group discussions at all. The lack of peer group discussion is one of the crucial factors to raise the mathematics problem among the students.

Discussion with Senior

Senior discussion is important for students to communicate mathematical ideas effectively. Senior discussion helps to make student's high understanding. Students need the explicit help, which can only be given by extended discussion, to establish these relationships between different mathematical topics; even student whose mathematical attainment is high do not easily do these themselves

Here senior discussion means discussion with the senior class students and the senior people who have mastered the knowledge on the students' subject by any means. The senior reflects here for class teachers, subject teacher or head teacher.

The researcher had observed the class repeatedly while the data was collecting for the study. The researcher found that there was no provisions for senior discussions to grade X and XI. The researcher asked the subject teacher, *"Why don't you make any discussion between different grade students to advance their knowledge?"* He simply replied, *"We have not this tradition, I haven't seen any such activity by any teacher and in any class since my entrance to this school and I have no interest on this. My duty is to teach but not group and gathering the students"*.

The researcher asked a student, *"Do you like to interact with your senior class students on your subject?"* She replied, *"No, I don't like because they always behave us they*

are big class students than us and always will be. I am afraid with them. We never play with them."

The view of the head teacher, *"We have no way to finish our curriculum in time. We have no time to make any discussion regularly. We want our students be better on their subject by reading themselves. We have no money and plan to invite the scholars to make different students interact in one class. What we are doing is okay, we think."*

The above responses are shows that there was no environment of senior discussion. Regmi (2012) emphasis on senior discussion, senior discussion helps the students to raise expectations by showing good work and explaining what is good about it to invite students to make generalizations and to provide evidence to support their conclusions and opinions. The key ideas of the lesson reinforce teaching points made earlier; assess what has been understood and correct and misconceptions.

The cases make a conclusion on this is that there haven't made any events to interact students with seniors because the head teacher and the subject teacher are not motivated for student oriented teaching learning activities; esp. senior discussion. This is not really a good environment for any students. And the negative effect is going to students learning mathematics.

Homework

Homework assignment is the best way of any grade students to develop his/her comprehension on a subject and to develop competence in the subject matter. It directly affects achievements. General effects of homework might be achievement, confidence and the competence. Home work assignment and the mastery in mathematics can be seen co-

related elsewhere in learning activities. Home study properly related to the students achievement and to improving scholarship. Home study might be the most valuable to students of average intelligence in mathematics.

While the researcher was during the field visit for this study, a study was done to seek the information that how many students do homework regularly? What is their performance on it? Evaluation had made under these questions.

In the study, only 20% students have the sufficient time to complete their homework assignments in their home. The rest girl student has not sufficient time to do homework so they had copied the answers from their friends. 80% girls' students told that they do their assignments if they have enough time for home study. Obviously, girls' students who did their homework assignments performed better in result, they obtained the marks at least 50% of marks in their last examination. Girl's, who didn't submit their assignment regular, couldn't perform well in their examinations, they obtained below then 50% marks.

Researcher asked the reasons to the students why they do not do homework regularly then the responses of the students are as follows:

"Teacher gives homework daily but we can't complete because of limit time at home and we can't solve the problems of mathematics at home."

"The teacher checks homework after a long time so we can't correct it if it is wrong."

"Parents didn't support me to study mathematics; I give much time to household work. Environment of home is not good to do practice of mathematics."

“I always try to help my parents to making money; I have not sufficient time to pay attention on mathematics.”

The above responses show that the main reason of not doing homework assignments is the household works. Reviews of homework research (Cooper, 1989; Keith, 1982) support the view that time spent on homework have a positive impact on achievement gains. According to Cooper (2001) some positive effects of homework include better retention of factual knowledge, increased understanding, curriculum enrichment, better study habits and skills, greater self direction and self-discipline, and more independent problem solving. Different studies say non-home-study student are sporadic in their achievements. A proverb "Practice makes a man perfect" can be implied here since mathematics can be mastered through practice. But in case school students can't did their homework because of household problems.

Thus the researcher now came to the conclusion on this that girl's students have not enough time for home study and doing their homework assignments. They are being deprived for their participation in learning mathematics due to the different household works and domestic problems.

Class Work

Class work is way of peer group discussion, interaction with teacher, mind concentration on study and make positive attitude towards mathematics. Class work is the best way of any grade students to develop his/her comprehension on a subject and to develop understanding level in the subject matter. It directly affects achievements. General effects of

class work might be achievement, confidence and the competence. If regularly class work is given then class became friendly and students can't feel hesitation with teachers and friends.

In that school researcher found that teacher didn't give the class work to the students. One day researcher request to the teacher to give the class work regularly to see how the students react then some episode of class are as follows:

First day teacher gives the class work, and researcher found that students can't solve the problem and teacher didn't support to solve the problems. Teacher go to the office after giving the class work, then student's make noise and talking each other in non subject matter. They didn't want to discuss to each other about mathematics problem. Next day again teacher give class work and sit in class then student seem changed, they seemed curious about the problems, they discussed about problem and asked to the teacher also with hesitate. After continue this process then after fifth day class seems very changed. 50% students have no hesitation to ask the question with teacher and students.

The above response shows that if teacher give class work regularly then student made habit to solve the problem in class, they focus on study and ask to the teacher friendly where they cannot understood. If teacher also support to solve the problems and sit in class then student cannot talk about non subject matter, they discuss each other about mathematics problem.

Effective school research indicates how much time students are engaged in learning contributes strongly to their achievement and more student study. Other being equal the more they learn. On the other hand modern concept of learning emphasis on individual teaching in the classroom. In which learners are actively participated and teachers can support in each

and every problems of the students. So class work is also important to develop the achievement in mathematics.

Library and Instructional Materials

Library is a good place to develop the reading habit of a student. A library, equipped with the sufficient reading materials along with course books and reference books helps the students to motivate them to read any subject. A good library has the vital importance of the library help the students to achieve better in the subject.

Response of students about library, “our school has not a library so we cannot get sufficient reading, learning and instructional materials. Our school didn’t give to us the physical facilities of library; we wished to have a library.”

Above response shows that there wasn’t a library and sufficient learning-instructional materials in the researched school. The National Council for Teachers of Mathematics (NCTM) recommends instructional materials that promote conceptual understanding of mathematics concepts and useful skill development. Instructional Materials serve as the channel between the teacher and the students in delivering the instruction. They may also serve as the motivation on the teaching- learning process. Kevin Delaney mainly focused in the resource in teaching mathematics. Resources can be used for demonstration purposes but when this approach is combined with individual use the potential for learning increases. Mathematics teachers in secondary schools do use a variety of resources.

Thus role of physical and instructional facilities plays a significant role in the better performance of the students which is very lack in school. So without managing good physical and instructional facility, school can’t improve the student progress. The researcher assumes

that lack of library and adequate teaching-learning materials are also the cases of underachievement in mathematics.

Teaching Learning Process

Teaching learning process plays a great role in the achievement of students. It includes all the functions that are used inside classroom to achieve the goal of lesson. From the observation researcher found that usually, the teacher used teacher-directed structured practice with students. He did not use any relevant teaching materials during teaching learning activities. He was not trying to encourage low performer students in discussion and engagement on tasks. Teacher centered method was the main type of instructional teaching used in the classroom. Teacher did not curious and active while teaching and he used the teacher centered method to teach. He cannot make the mathematics class interesting. Teachers are not trained on motivating students with different ability. Teachers did not focus to the student while teaching. And math teacher did not teach regularly in class. He solved the one or two question in the board and gone to the office and next day he started the new topic. Teacher did not interest to give class work to students and did not interest to check the homework of the students. There was no peer group discussion and no interaction between teachers in classroom. Students also did not curious and active while learning mathematics, they did not enjoy while solving mathematics problems. They feel mathematics is less interesting then other subject. They did not go to school regularly. They did not complete homework given by math teacher because they can't solve the all of problems of mathematics and they did not have enough time to study mathematics. They study mathematics whenever they are free. It is difficult to ask the problem with teacher which has not been understood. Students did not keep on practice of already taught mathematics problems.

Views of students about teaching learning process are as follows:

“Teacher gives focus only to talent students. I’m not satisfied with the teaching method that our math teacher is used.”

“I can’t understand what teacher teaches us. Classroom is very noisy so I can’t listen what teacher said. Discipline cannot found in mathematics class.”

“I feel escape from the mathematics classroom because I can’t give attention on study of mathematics in classroom, teacher did not care about our study and our future.”

“I am not interested in mathematics; it is a matter of my headache because of poor mathematics background. Our teacher never provide clear concept on each topic, so we are weak in mathematics.”

The above responses are shows that because of bad teaching learning process, students didn’t have any interest in subject mathematics. Teacher didn’t use discovery method or problem solving method etc. Bruner’s theory emphasis that students can learn from guided discovery learning, problem based learning. Discovery learning believes that it is best for learners to discover facts and relationship for themselves. But in case school these learning method didn’t use in classroom teaching of mathematics.

Social construction explain that motivation is the key component for learning which makes classroom more interesting and encouraging. Teacher should become a facilitator in the classroom and should provide positive reinforcement. The positive reinforcement is always emphasizing in good learning. But the case school hasn’t adopted this approach in classroom teaching of mathematics.

Thus it is concluded that teaching learning process of school is the major aspects for betterment of student achievement. Teacher should pay attention to improve the condition of teaching and learning environment otherwise student's progress tends to zero. Thus traditional classroom environment during teaching learning activities is also a responsible factor for low achievement in mathematics.

Teacher said, *"no one students come regularly in school. If they missed today's topic of mathematics then how can they understand yesterday's topic of mathematics, so their pre knowledge is very poor, because of they can't understand mathematics. Then how can I teach all of them which topic they missed in class? And how can I give pre knowledge to every student's. That is their fault. Because of adolescence, they have physical, mental and emotional changes because of they can't mind concentration on learning so they are busy in talking each other in non subject matter, so class is noisy. This is another cause of low achievement in mathematics. I think if every student should be on same level of understanding and if time of class period is much only then interaction with students or peer group discussion and effective teaching-learning process could be done."*

Head teacher said, *"Most of the students are irregular in the school because of their household problem. So students should be regular in the school to improve the poor performance in mathematics."*

The above responses show that irregularity of students affects on their performance in mathematics. Because of irregularity of student's they can't get better pre knowledge of the subject matter. Bruner's theory emphasis on that from the pre knowledge of them, they can gain new knowledge and they can find the relation between pre knowledge and new

knowledge. But in case school students did not have better pre knowledge and they have poor mathematical background.

Thus it is concluded that in teaching learning process pre knowledge of the students also play important role. Because of the lack of pre knowledge they can't gain the new knowledge. So this is also the factor of causes of low achievements.

Home Environment

Home is the first school of students so the home plays the vital role in learning mathematics. A family education and parents or seniors behavior affects achievement in learning mathematics.

From the observation researcher found that the learning environment of mathematics in not better for the girls at home, they have no time to study mathematics at home because they had to do most of the household works before gone to school and after come from school. They busy in the household work in out time of the school. Their parents did not manage tuition and coaching classes, all required materials for the study mathematics and they did not discussed about their learning progress report with their math teacher. Their parents treat unequally to son and daughter because their parents are not well educated. Educated parents also can't give the time to the daughter for study mathematics. Parents did not force to the daughter for go to school regularly. Researcher found that because of economic condition of family a lot of students were busy to make money for the home. And the culture of the family also disturbed to the girls in study. Female have inferior place in their society. There was low role and opportunity for girls in society.

Many parents were said that *if daughters passed on SLC exam then easy to marriage of daughter with nice persons so we don't want to more number in mathematics or other subject in SLC, we only want they pass in the SLC exam and then they will get marriage because they are property of another family. One day they will be gone to another house. After marriage they could be done all work as a house wife so we trained them from now, so it is necessary to complied to daughter at household work. Let they get more number in mathematics then what we do with that number. They cannot become a doctor or engineer with good achievement in mathematics because we can't pay the money for science or expensive subject. After SLC only they can be read education or commerce subjects and after read them subject they can not found any good job so we didn't want to send to daughter collage after SLC.*

One parent said to the researcher that, *“what you do with master degree certificate of mathematics, lastly you also unemployed, only you can found job in boarding school in lower secondary level, because girls can't teach mathematics in secondary level or higher level and school also did not give opportunity to the girls to teach mathematics at secondary or higher level. Lastly you will have only two options, one is teach in boarding school in low salary and another one is read the book of kharidar, subba, adhikrit. Then what is important of mathematics and why we say to daughter to give more time to practice in mathematics.”*

About the home environment of the students the mathematics teacher said that, *“because the parents should not pay to more money in government school so they did not interested to participate in school and they did not care about their daughter education, they did not care about their study like how is their study, how they can learn, what school should be do etc. If parents want to give nice education to daughter then they admitted to the*

students in private school but parents did not want to give nice education to daughter. They only want that their daughters were living and study very far from boys so they admit their daughter in Girls School. Very few of the parents meet me and consult about their child's mathematics learning."

Views of student's about home environment are as follows:

"In my family no seniors are school educated. They can't teach and motivate me to do mathematics and can't favor me to create the hove environment for practice."

"I give much time to household work; I haven't enough time to practice mathematics at home."

"My parents always disturbed me by talking about my marriage."

"My culture also effect in my study."

"I always try to help my parents to making money."

Above responses shows that girls haven't enough time to do exercise of mathematics at home and repeat the chapter which are teach in class. E. L.Thorndike emphasis on the law of exercise, recall, recognition, relearning, and reconstruction. But home environment of girls is not good for do exercise, recall, recognition, relearning, reconstruction. They haven't enough time to do practice at home because of household problems.

According to Vygotsky, culture plays essential roles in human intellectual development and learning. Girls response also shows that the culture of girls also effect in

learning. Mainly chhaupadi pratha disturb the girl's students. So it is also the factor of causes of low achievement.

Researcher concluded that the education status of the family, lack of good motivation and burden of domestic work had seen the major factors to hinder to get good achievement of the students. Poverty factor is playing crucial role to backward the student and suppressing their positive psychology to earn better education. Because of that home environment plays very important role to get better result in mathematics.

School Environment

Researcher found that school did not manage all the teaching materials for learning mathematics. There was no library to develop the reading habit of a student. Teachers did not suggestive to motivate students to study mathematics. There was no rule to coming regular in school and teach regular in class. And there was no rule of punishment and reward for the regular and non regular for the students. There was no rule for supervision of class regularly and solve the school problems. There was no environment to the help each other in study mathematics. School did not give the chance to discuss with the senior students, with the teachers and with peer group discussion. Teachers said that *all government schools are seems same like our school. In government school no hard rule to teach and learn mathematics. Government school is for all but neither can be for all, nor for teacher nor for students and nor for parents. No one interested to solve the problems of school.*

When researcher asked to head teacher, *"how is your school environment and classroom environment?"* then head teacher said that, *"environment of our school is very good. All physical facilities are available in the school like play ground, little garden,*

building of two floors with a lot of classroom; canteen is available in the boundary of school. School is located in the peace and beautiful place where no out sounds are coming to disturb and no pollution is here. But we have not a library and a lot of teaching materials. We should manage them recently. Classroom environment is little bit poor of mathematics class because the sound of mathematics teacher is very low and slow because of this reason student's can't listen the sound of teacher what he teach then they did not careful about learning so class became very noisy. The trained teacher also did not try to use their knowledge in classroom in our school. There was no extra class provided to students. So the mathematics achievement of our school's is not satisfactory. We solve this problem soon."

Above response shows that the physical environment of the school was satisfactory but the psychological environment was not good. The policy of the school is not good for low achiever students. Head teacher can't make the school environment is good for learning mathematics. Sharma (2005) has recommended that the head teacher should be the man of task oriented in order to make the school effective. School leadership should be handled over to such person. The head teacher should work in school such a way to make the teacher task oriented being regular in the school and taking care of the problem of the teacher in academic and social needs. The head teacher is the instructional leader of school. He had to provide classroom support, administration, teaching observation as the central figure of school. But in a case school such type of work not be seen.

Thus it is concluded that because of negative thinking of teachers, students and parents about the government school as well as girls' school, there were nobody tried to made effective teaching-learning environment at school and no one interested to make a good classroom environment which was direct related and effect to achievement of mathematics.

Good school environment is not enough for good achievement, a good classroom environment is also necessary to get better achievement especially in mathematics.

Attitude towards Mathematics

From observation and interview researcher found that students did not like mathematics subject. They feel mathematics is boring subject. Their society treat unequally between son and daughters, there are no senior literate people whom can give the positive response for mathematics. Their society had no idea whether the subject matter of mathematics is good or bad. The society does not inspire to learn mathematics. All of society members said that mathematics is hard subject and girls were can't study. The society and persons did not admire the girls in learning mathematics. Society thinks that *if girls have good education then they became proud girls and they didn't want to do household work, they also fall in love after SLC or inter so we don't want to study to daughter to much. They became literate that is enough for daughter.* There is one statement in their society "*chhori lai badhi padhaunu hunna, arka ko ghar jane maal ho, bdhi padher k grchha last samalnu prne chulo chauka nai, badhi padhayo vne bigrinchan*".

The above response shows that the society has negative attitude towards the education of daughter. Because of home environment and society, students have negative attitude towards mathematics as well as education. According to sex role theory the differences between boys and girls are created by society and culture. Society believes that girls cannot have good mathematics achievement so it is better to take other non-math subject as optional. Due to the lack of confidence, girls are weak in mathematics. Interest of reading mathematics in future blows away. Therefore, they are not motivated towards mathematics related job. As

a result, they do not dare to read mathematics. So the girls have negative attitude towards mathematics.

Ma and Xu, (2004) emphasis that attitude towards mathematics plays a crucial role in the teaching and learning processes of mathematics. It effects students' achievement in mathematics. The teaching method, the support of the structure of the school, the family and students' attitude towards school affect the attitudes towards mathematics. Positive attitude towards mathematics leads students towards success in mathematics. Attempt to improve attitude towards mathematics at lower level provides base for higher studies in mathematics. It also causes effect in achievement of mathematics at secondary school level.

Thus it is concluded that because of negative attitude of society and family towards mathematics, girls also have negative attitude towards mathematics. If their society did not support them for study mathematics then how they can study better and how their attitude is positive towards mathematics as well as education so researcher concluded that attitude towards mathematics is also effect in achievement of mathematics.

Chapter V

SUMMARY, FINDING, CONCLUSION AND

RECOMMENDATION

This study has revealed the facts on low achievement in mathematics in general. Summary, finding, conclusions and recommendation of this research are presented in this chapter.

Summary of the Study

This is the case study of Shree Janaki Girls Higher Secondary School. The purpose of the study was to find the causes of low achievement in learning mathematics of girls' students and to find out the ways of using materials, strategies and procedures for mathematics learning. The design of the study was qualitative as well as descriptive in nature. The major tools of the study were class observation, semi structured interview schedule and school documents. The respondents of the study were low achiever students, corresponding parents, teacher and head teacher of the case school. The researcher developed the interview themes, observation form with the help of previous study thesis, supervisor and experts. The information obtained from different respondents were analyzed and interpreted on the basis of different theories.

After analysis and interpretation of different data the researcher found that there is a strong association with causing variables and mathematics achievement. The variables are interaction with the teacher, peer group discussion, discussion with senior, home work, class work, library and instructional materials, teaching-learning process, home environment,

school environment, attitude towards mathematics, lack of parental education, irregularity of students, lack of students oriented teaching learning environment, gender suppressions, weak financial condition, no initiation towards the development of students personality on discussion, interaction, class work and no extra classes for low achiever students are the causes of low achievements of girls students in mathematics.

Finding of the Study

The main research objectives of this study was to identify the causes of low achievement of girl students in mathematics at secondary level and to find out the ways of using materials, strategies and procedures for mathematics learning. The findings of the study were mentioned as below.

- Girls Students have not enough time for home study and to do exercise practice of mathematics at home because of household works and domestic problems. Because of non educated parents culture of the home is also not good for study. This is major causes of low achievement of girls in mathematics.

- Because of weak financial status, students also did work to earn money for their family and this is major reason of low attendance in classroom. Irregularity of the students is cause of lack of pre knowledge and it is also causes of low achievement in mathematics.

- School policy hasn't concerned about mathematics learning. There weren't extra classes of mathematics for low achiever students. There was no library and sufficient learning materials in school, which are causes of low achievement in mathematics.

- Teaching style was traditional. Lack of student oriented teaching learning environment is causing to making the student's learning poor.

- Mathematics was considered as a difficult subject by the students. The students of mathematics had negative attitude to their teacher as well as math subject. This situation is causing to make low achievement of girl students.

- This study found no initiation of the school administration to make the environment to girl student-friendly. No efforts of school administration towards the development of student's personality on discussion, interaction, class work which is making the low participation of girl students in learning mathematics and that affects on the achievement of students.

- As a whole, lack of student oriented teaching learning process, bad school environment and home environment, negative attitude towards mathematics of girls, no interaction with teacher, no peer group discussion, no discussion with senior, no home work checked, no class work is given, no library and instruction materials are the major factor of causes of low achievement in mathematics.

Conclusion

The teaching method, facilities available in the school, student's participation in teaching learning activities and role of the family affect the learning of the mathematics. Active participation on learning mathematics leads students towards success in mathematics. Attempt to improve participation towards mathematics at lower level provides base for higher studies in mathematics. Girls are often discouraged from mathematical work in their primary

level of classes in society. Therefore they dislike it in the secondary level of classes. So their attitude becomes negative towards the mathematics and it affects their study in mathematics. So, it also affects their achievement of mathematics at secondary level. Also poverty factor is playing crucial role to backward the student and suppressing their positive psychology to earn better education. The education status of the family, lack of good motivation and burden of domestic work had seen the major factors to hinder to get good achievement of the girl students. The finding of the study show that the traditional type of exercise in teaching learning activities was also one of the causes of low achievement. There were no proper interaction between teacher and students. The school's policies were not sufficient to address low achievement. There were communication gap between teacher and parents. This study clearly showed the gender suppressions, weak financial conditions, non-educated family, poor instructional condition of the school, irregularity of students in class, lack of teaching learning materials, bad home environment, lack of student oriented teaching learning environment and no initiation towards the development of students personality on discussion, interaction, class works are the causes of low achievement of girl students in mathematics.

Recommendation

For the development of the nation; well educated manpower are always be expected. Good schooling and better education make the peoples thinking positive, constructive and the creative. Educated citizen are people how can contribute the nation building up. This study has pointed the barriers of girls student' education in general and their learning in mathematics in particular.

To solve the problems, we have to diagnose the similar problems and we have to cure them. This study recommends to such points which could be researched and the result of researches can be use to minimize the problems. The recommendations are:

- A study on low achievement of girl students in different subjects can be carried out for different levels, regions, ethnicity and subjects.
- A study on girls' low attendance and under achievement can be carried out.
- A study can be carried out on the effect of parental involvement and supervision in mathematics classroom and implication.
- Student centered teaching learning methods and techniques should be emphasized.
- The school should manage the physical facilities to improve the quality of education.
- School should manage extra class for low achiever students.
- Teacher should provide the mathematical concept according to their pre knowledge.
- Teacher should apply the recent techniques and innovator of mathematics.
- School should manage co-operative environment between teacher-students, teacher-teacher and teacher-head teacher.
- There should be continuous communication among various stakeholders such as students, parents and teachers.

Appendix-A

Interview Guidelines with Students

Name of the student:-.....

Age:-.....

Class:-.....

Roll no:-.....

Address:-.....

Date:-.....

The interview with the girls' students was taken in the basis of the following main topics.

- Personal history.
- Family background.
- Environment of home.
- Difficulties in learning mathematics.
- Relation between girls' students and mathematics teacher.
- Self esteem and learning mathematics.
- Reading opportunity at home.
- View of the mathematics teacher.
- View of the friends.
- Expectation about mathematics learning.

Appendix-B

Interview Guidelines with Mathematics Teacher

Date of interview:-.....

Name of the teacher:-.....

Ethnicity:-.....

Qualification:-.....

Religion:-.....

Trained/Untrained:-.....

Sex:-.....

Teaching experience:-.....

Age:-.....

Address:-.....

The interview was taken on the basis of following area with the mathematics teacher.

- Teaching strategies.
- Problem on teaching to girls students.
- Encouragement provided to the girls students learning.
- Support for the poor performance.
- Use of instruction materials.
- Class room practice.
- Participation in the class.
- Reward and reforms to students.
- Extra class for students.
- Area of difficulties in learning mathematics.
- Effect of culture and language in learning mathematics.
- Relation with students, teacher and head teacher.

Appendix-C

Interview Guidelines with Head Teacher

Date of interview:-.....

Name of the head teacher:-.....

Ethnicity:-.....

Qualification:-.....

Religion:-.....

Trained/Untrained:-.....

Sex:-.....

Teaching experience:-.....

Age:-.....

Experience as a head teacher:-.....

Address:-.....

The interview was taken on the basis of following area with the head teacher.

- Learning environment in the school.
- Girls' student opportunity for learning with teacher.
- Guidance to mathematics teachers for better achievement.
- Causes for low participation in learning mathematics in class.
- Causes of low achievement in learning mathematics.
- Extracurricular activities for students.
- Supervision of math class.

Appendix-D

Interview Guidelines with Parents

Date of interview:-.....

Religion:-.....

Name of the Parents:-.....

Sex:-.....

Qualification:-.....

Age:-.....

Address:-.....

The interview with parents will be taken on the basis of the following main topics.

- Parent's behavior towards the daughter at home.
- Main interesting area of the daughter at home.
- Support to the daughter for learning mathematics.
- Reading opportunity of the daughter at home.
- Effect of culture.
- Economic status.
- Expectation from the daughter and school.
- Environment at home for learning.

Appendix-E

Observation Note for Girls Students

School name:-.....

Principal name:-.....

Math teacher name:-.....

Class:-.....

Total no. of students:-.....

Date	Students attendance	Topics	Teacher activities	Interaction with teacher	Peer group discussion	C.W	H.W	If others	Observation comments

--	--	--	--	--	--	--	--	--	--

The observation of girl's students will be taken on the basis of following main topics and notes will be made every day in detail.

- Teachers' behavior towards the girls' students.
- Main problem of teaching and learning mathematics.
- Teaching and learning process, home environment, school environment, time variable, attitude towards mathematics, social variable.
- Girl's participation in learning mathematics in terms of homework, class work, library, interaction with teacher, peer group discussion, discussion with senior.

Appendix-F

Questionnaire Form for Girls Students

Name of the student:-.....

Age:-.....

Class:-.....

Roll no:-.....

Address:-.....

Date:-.....

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, sister and me.					
10.	My parents do not discuss about my learning progress report with 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 not better for me at home.					
14.	My parents always say me to do not spend more time in mathematics at home.					
15.	School manages all the teaching materials for learning mathematics.					
16.	Teachers are always suggestive to motivate girls' student to study mathematics.					
17.	Teachers teach focusing to the students.					
18.	It is difficult to ask the problem which has not been understood.					
19.	I like to solve basic mathematical problem with my friends.					
20.	The basic math teachers teach regular in the class.					
21.	All teachers and students help to study mathematics.					
22.	I study mathematics whenever I am free.					
23.	I always complete homework given by math teacher.					
24.	Teacher gives class work as well as homework and checks it.					
25.	I keep on practice of already taught mathematics problem.					
26.	Course of mathematics is not complete in time.					
27.	I am regular student of math class.					
28.	Teacher does not give class work as well as homework.					
29.	I feel difficulty in reading mathematics key words or symbols.					
30.	I feel hard to comprehend over all meaning of mathematics problem.					
31.	I myself have no trick to solve any problem of mathematics.					
32.	I need the help of teachers to solve any problem of mathematics.					
33.	I cannot find myself the wrong of any mathematics questions.					
34.	I always make mistake in solving the mathematics problem.					
35.	I think mathematics is boring subject.					
36.	Our society unequally treats boys and girls.					
37.	There are literate people in our society.					
38.	Female have inferior place in our society.					
39.	Low role and opportunity of girls in society.					
40.	Our society has no idea whether the subject matter of mathematics					

	is good or bad.					
41.	The society and persons admire the girls in learning mathematics.					
42.	The societies do not inspire to learn mathematics.					

SA = Strongly Agree

A = Agree

U = Undecided

D = Disagree

SD = strongly Disagree

Bibliography

- Baroody, A. J. (1987). *Children's Mathematical thinking: developmental framework for preschool, primary, and special education teachers*. New York: Teachers college press.
- Bishop, A. J. (1996). *International handbook of mathematics education*. Springer.
- CERID (1998), *Evaluation System in Their Primary Schools of Nepal*, (Kathmandu, CERID/T.U., Tripureshwar)

Cooper, H. (1989). *Homework*. New York: Longman.

Cooper, H. (2001). *Homework for all: In moderation*. Educational Leadership, 58(7), 34-38.

Retrieved October 17, 2007, from

[http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?
_nfpb=true&_ERICExtSearch_SearchValue_0=EJ626292&ERICExtSearch_Search
Type_0=no&accno=EJ626292](http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=EJ626292&ERICExtSearch_Search_Type_0=no&accno=EJ626292)

Chhetri D.B., *Studies in Mathematics Education*, Sunlight Publication

Dhakal, H. (2006). *A study of factors affecting the girls student attitude towards optional mathematics at secondary level*. Unpublished Master Thesis, Department of Mathematics Education, T.U. Nepal.

Gates P. (2001). *Issues in Teaching Mathematics*, 9th chapter Teaching Mathematics
Resourcefully by Kelvin Delaney

Ghimire, T.R. (1997). *A study on factors affecting teaching learning mathematics at secondary level*. Unpublished Master Thesis, Department of Mathematics Education, T.U. Nepal.

Jagri, R.B. (2009). *Girl's Participation in Learning Mathematics*. Unpublished Master Thesis, Department of Mathematics Education, T.U.

Khanal, P. (2010). *Introduction to Educational Research*, Sunlight publication

Keith, T. Z. (1982). *Time spent on homework and high school grades: A large-sample path analysis*. Journal of Educational Psychology, 74, 248–253.

Ma, X. and J. Xu (2004), *Assessing the relationship between attitude towards mathematics*

and achievement in mathematics: A meta-analysis. Journal for Research in Mathematics Education, Volume 28(1), pp. 26-47.

Niure D.P., *Educational Research Methodology*, Quest publication

Pandit, R.P. (2007). *Foundation of Mathematics Education*, Shanti Nagar Marg, Kathmandu.

Pandey, T.R. (2008), causes of low achievement in mathematics. M.Ed.Thesis, T.U. Nepal.

Pandit, R. (1999), *Inferential Statistics in Research Education*, New Baneswar, Kathmandu: Ananta Prakashan.

PISA (2003). *OECD programme for International Student Assessment (PISA)*. Retrieved on 29 June 2011 from <http://www.pisa.oecd.org/>

Regmi, A. (2012). *Participation of Girls Students in Learning Mathematics*. Unpublished Master Thesis, Department of Mathematics Education, T.U.

Regmi M.P. and Aryal T. (2010). *Educational Psychology*, Sunlight Publicatin, Kirtipur

Sapkota, M. (2011), *Causes of Failure in Mathematics at School*, M.Ed. Thesis, faculty of education, T.U., Kirtipur Nepal.

Subedi, G.P. (2005). *Factor affecting failures in mathematics in SLC examination*. Unpublished Master Thesis, T.U. Nepal.

Tiwari, K.R. (2002). *A study of attitudes of farmer and non-farmer parent towards the school mathematics*. Unpublished Master Thesis, T.U. Nepal.

Upadhyay H.P., Pradhan J.B. and Dhakal B.P. (2067). *Trends in Mathematics Education*. Balbalika Education Publication Pvt. Ltd. Samakhusi, Kathmandu.

Upadhyay, H. (2001), *Effects of Constructivism on Mathematics Achievement of grade 5 in Nepal*, Ph.D. dissertation, Panjab University, Chandigadh, India.

Statistics pocket 2011

Nepal Living Standards Survey 2010-2011

http://www.ijhssnet.com/journals/Vol_1_No_15_Special_Issue_October_2011/34.pdf

www.google.com