CAUSES OF ANXIETY IN MATHEMATICS LEARNING: A CASE STUDY OF HIGHER SECONDARY SCHOOL STUDENTS

A

THESIS

BY

SAROJA NEUPANE

FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

SUBMITTED

TO

DEPARTMENT OF MATHEMATICS EDUCATION

CENTER DEPARTMENT OF EDUCATION

UNIVERSITY CAMPUS

TRIBHUVAN UNIVERSITY

KIRTIPUR, KATHMANDU, NEPAL

LETTER OF APPROVAL

Thesis Submitted by

Saroja Neupane

Entitled

Causes of Anxiety in Mathematics Learning: (A Case Study of Higher Secondary School Student) has been approved in partial fulfillment of the requirements for the Degree of Master of Mathematics Education.

Committee for the Viva-Voce

Signature

Asso. Prof. Laxmi Narayan Yadav

(Chairman) ……

Prof Dr Hari Prasad Uppadhyay

(Member) …….

Mr Lok Nath Bhattarai

(Member) ……..

LETTER OF CERTIFICATE

This is to certify that Ms **Saroja Neupane,** a student of academic year 065/066 with Campus Roll No. 315/065, thesis no. 1002, Exam Roll No 281382 (2066), T.U. Regd No. 9-2-29-1518-2004 has completed her thesis under my supervision during the period prescribed by the rules and regulations of Tribhuvan University, Nepal. The thesis entitled, **Causes of Anxiety in Mathematics Learning: (A Case Study of Higher Secondary School Student)** embodies the results of her investigation conducted during the period of 2014 November to August 2015 under the Department of Mathematics Education, Central Department of Education, University Campus, Kirtipur, Kathmandu. I recommend and forward that her thesis be submitted for the evaluation to award the Degree of Master of Mathematics Education.

.....	.....
(Mr Lok Nath Bhattarai)	(Asso. Prof. Laxmi Narayan Yadav)
Supervisor	Head

ACKNOWLEDGEMENTS

I, as a researcher of this study, would like to acknowledge the generous help given by my respected teachers and colleagues who were directly and indirectly involved to carry out this study. Firstly, I would like to extend my sincere gratitude to my respected supervisor Mr Lok Nath Bhattarai, Department of Mathematics Education, TU, Kirtipur from whom I have got invaluable suggestions, encouragement, insightful comments and appreciable guidance which constituted the foundation for this study.

I would like to offer my deep gratitude to my respected teacher Asso. Prof. Laxmi Narayan Yadav, Head, Department of Mathematics Education, TU, Kirtipur for the inspiration and suggestions to complete this work. Furthermore, I would like to acknowledge Prof. Dr. Hari Prasad Upadhyay, Chairperson, Mathematics and computer science subject committee, TU, Kirtipur for the invaluable suggestions to shape the study in this form. Similarly, I would like to acknowledge to all the teachers of Department of Mathematics Education.

I wish to acknowledge and express my profound gratitude to the Principals, mathematics teachers(Mr. Dilli Ram Paudel of VNHSS and Mr.Tikaram Pokhrel of SHSS) and students of selected higher secondary schools for their valuable suggestions, facilitating interview and observation during my research work. I cannot stay without giving special thanks to my respected father and mother for providing me supports.Also I want to thank my husband for his kind support for my study.

.....

Saroja Neupane

December 2015

ABSTRACT

Mathematic and anxiety are considered as two sides of a coin. How anxiety is caused in learning mathematics is the main problem to have low achievement and performance in Mathematics in Nepal. The main objectives of this study were to find out the causes of anxiety in mathematics and to suggest the remedial measures. This study was done in two schools of Kathmandu valley. Mathematics teachers and students studying mathematics in higher secondary level within Kathmandu Valley were the population of the study. Two mathematics teachers, eight students of two higher secondary schools were selected as research participants. This is a case study about the causes of anxiety and remedial measure to reduce anxiety, so qualitative approach of research methodology was used. Mathematics teachers and students were interviewed.

Most of the students didn't practice the mathematical problems is a main cause of anxiety in mathematics. Understanding the structure of subject-matter have resulted loss of self-efficiency to perform the mathematical task. The challenge of discipline on students implies dominated behavior toward teacher. Negligence to teachers implies directly or indirectly anxiety in mathematics learning. Good discipline creates the seriousness toward study and increases the creativity about the mathematical thinking. Such thinking is directly helpful in reducing to anxiety in mathematics.

Teacher's negligence to check homework is also contributing to the negligence to do homework from the side of students. As it is hampering to practice more and students get anxious when they get heavy amount of the task to be done at a time during exam time. Effective teaching/learning program is helping for reducing anxiety in mathematics

learning. Creative thinking skills are to be used by teachers to address the issue of anxiety in mathematics learning. Teachers need to create high quality mathematics programs than regular learning program such as Math Club, Math Quiz and Math Tour to motivate students in learning mathematics. As a result students can be engaged in different activities and enjoy in mathematics learning and understand the beauty of Mathematics. As a result students' level of confidence increased.

High degree of cheating behavior didn't force to creative thinking about mathematical subject-matter. Negative attitudes have forced to neglect mathematics study. Consequently the anxiety in mathematics was increased. The polarization of students played the negative role for conceptual understanding. Polarization of students was created unreasonable distance between talent and weak students. Group of talent students hoped that they have strong mathematical concept if they have not and went downward with over confidence. Group of weak students thought that they didn't understand the mathematics subject-matter.

TABLE OF CONTENTS

Chapter I

INTRODUCTION

Background of the Study

The existing society requires education, formal way of learning, as basic need. People in our society have been realized to be educated for the life and education is life itself (Dewey, 1987). We cannot imagine our society without education. Education is most important thing for our daily life. In the previous days, it is called that the basic needs of people are just food, shelter and accommodation. But now days the society has totally changed and it is being modern. So, five developmental infrastructures are also included as basic needs. Among them education plays vital role in this modern society. In this contemporary society, without education nobody can survive. So, we can easily say that there is inseparable relationship between education and society. It means education is one of the system and backbone of the modern society.

Education system has various branches or parts which make it strong and perfect. Among these various parts, mathematics is most important weapon for continuing the system. Mathematical knowledge is one of the brilliant and most powerful tools to convert the world from one stage to another. To appreciate the place of mathematics, the short introduction to it can be explain as follows: The word mathematics is only one but it can be defined various ways.

Mathematics is the vast adventure in ideas, an exact science and truly saying the mirror of civilization. Mathematics is placed in high value in both physical and social sciences. Mathematics is a creation and mostly considered as mental phenomenon though it is heavily social. Mathematics is mental activity which consists in carrying out,

one after the other, and those mental constructions which are inductive and effective – Intuitionism. Most mathematical creations are the result of intuition. The direction of modern mathematics has been greatly influenced by the developments in other disciplines. The mathematical sciences have changed significantly during the past few decades. The most obvious change is the enormous growth of mathematics. Even the latest scientific and technological developments have extended each branch of mathematics and have proved mathematics as a powerful tool for any scientific achievements. Mathematics is as the science of quantity –Aristotle. Mathematics is also considered as a subject of logic as all mathematics is symbolic logic – Bertrand Russell (1903).

The history of teaching mathematics is as old as the human civilization. Mathematics shows much more durability in its attention to concepts and theories than do other sciences. Though there might not be formal schools, the mathematical knowledge and skills were learned and taught in order to use in their daily lives. But the time has changed the necessity of learning mathematics with the formal approaches. There are different views on teaching and learning of mathematics.

Higher education in mathematics in Nepal started from intermediate level at Tri-Chandra college in 1918(Arts) and in 1926(science). Mathematics classes in B. A, B.Sc. were started in 1932 and 1942 respectively at the same college. The mathematics curriculum at Bachelor level at that time included topics from Algebra, Trigonometry, Analytical Geometry and Calculus. However Master's level classes in mathematics were started in 1959 with the establishment of mathematics Department at Tribhuvan University.

Mathematics is abstract in nature and level of abstraction is based on different levels. Mathematics is the abstract science that investigates deductively the conclusions implicit in the elementary conceptions of spatial and numerical relations. It includes as its main divisions as Geometry, Arithmetic and Algebra (Oxford English Dictionary, 1933). There are so many parts of mathematics. Among them trigonometry is one. Without any presentation of trigonometry in mathematics, it will be break less van. So it is also most important part of mathematics.

Math anxiety is a phenomenon that is often considered when examining student's problems in mathematics. Ashcraft (2002) defines math anxiety as "A feeling of tension, apprehension, or fear that interferes with math performance" (p. 1). The first math anxiety measurement scale was developed by Richardson and Suinn in 1972. Since this development several researchers have examined math anxiety in empirical studies. Hembree (1990) conducted a through meta-analysis of 151 studies concerning math anxiety. S/he determined that math anxiety is related to poor performance on math achievement tests and that math anxiety is related to negative attitudes concerning math. Hembree also suggests that math anxiety is directly connected with math avoidance.

Ashcraft (2002) suggests that highly anxious math students will avoid situations in which they have to perform mathematical calculations. Unfortunately math avoidance results in less competency, exposure and math practice, leaving students more anxious and mathematically unprepared to achieve. In college and University, anxious math students take fewer math courses and tend to feel negative towards math. In fact, Ashcraft found that the correlation between math anxiety and variables such as confidence and motivation are strongly negative. According to Ashcraft, because math anxiety can cause math avoidance, an empirical dilemma arises.

In the context of Nepal, every student say, mathematics is hard to learn. One of the reasons is most of the mathematics classes are running by theoretical method. Most of the mathematics teachers and students have being saying that here are some rules and method for mathematics. If we forget them, then we can't solve the problem and unable to get success.

In the same case, when I go to the class of mathematics, students always ask where we use this theory. Mostly the questions of students are not justified by teachers in the questions like: What is the particular application of mathematics? Is it just passing this level? If you solve the given problems answer will easily come but same problem, if we start it is uneasy to us. Why? In our country Nepal, the person who is stronger than in theory is supposed to be more qualified and s/he will get full marks with happy succession. Because of such perception, the focus is on theoretical approach and most of the students feel difficult in understanding such approach. So, student feels anxious in as a whole mathematics.

Historical Development of Math Anxiety

Mathematically anxiety has been studied extensively over the last fifty years. Many researchers showed that mathematical anxiety is caused or influenced by past experience with teachers, the classroom environment, parents thought not inherited from parents and from remembering poor mathematical performance.

Sabrina (1964) found that the word anxiety derived from the French word "anxious", which refers to choking sensations in the throat (Fireman, Hayes &Wilson, 1998). Moreover, Lewis (1970) defined anxiety as a state of emotion supported by fear and dread. Still another definition of anxiety can be given as a psychological perspective.

Hambree (1990) defined that it is a psychological reaction to events with uncertain but potential aversive outcomes.

Richardson and Suinn (1972) defined mathematics anxiety as a feeling of anxiety that interferes with a person's ability to work with numbers and solve mathematical problems both in academic and real life situations. "Mathematics anxiety" was first studied in the late 1950s. Dreggier and Akien (1957) noticed that undergraduate college students reacting emotionally to arithmetic and mathematics. Although this reaction appeared to be similar to test anxiety, in general they found that mathematics was a construct all its own and labeled it number anxiety. Test anxiety research contains a section that explicitly acknowledges mathematics anxiety (Honoree, 1990).

Richardson and Woolfolk (1980) found that mathematics anxiety was not only an emotional reaction to the use of mathematics but also to the content of mathematics. Boxton (1981) identified that panic, fear, anxiety and embarrassment resulting from an emotional reaction in doing mathematics. Cemen (1987) expanded the definition of mathematics anxiety to include the perceived threat to self-esteem. The fear reaction caused by mathematics anxiety can also cause physical effects such as dry mouth, sweaty palms, queasy stomach or a headache (Fotoples-2000). Anxiety can lead to elevated heart rate, respiration, perspiration and blood pressure (Fireman et.al, 1998). The unpleasant emotion of anxiety is directed towards fear of threats in the future.

Mathematically anxious students do not like preparing for, or taking, mathematics tests. Many become anxious if they think they will be called on in class to do anything mathematical where others will be watching and perhaps evaluating their abilities. Cemen (1987) found that mathematics anxiety was the process of situational antecedents, which included the stressor and the contextual factors surrounding the

stressor. The stressor would lead to mathematics anxiety only if it was a perceived threat to the person's self-esteem. Contextual factor that could contribute to math anxiety include the class room environment, the way mathematics is taught, the nature of mathematics being learned and situational antecedents of test anxiety (Cemen, 1987).

The students having fear will not be successful in mathematics and will not want to take the chance of failing or appearing as incompetent. This self-doubt seems to be a personality factor that contributes to Mathematics anxiety (Cemen, 1987). There are three types of antecedents related to anxiety: Environment antecedents, which determine whether or not the individual will perceive the stressor as threatening to self-esteem and situational antecedents which surrounds the stressor and contribute to the perception of a threat (Cemen, 1987). The interaction of these antecedents produce the anxiety and is composed of two components; affective and cognitive components.

Cemen (1987) found that Mathematics anxiety is associated with two attitudes towards Mathematics: perceived usefulness of Mathematics to the student's life or career aspiration and that it is a male domain. If students have Mathematics anxiety they may convince themselves that mathematics is not useful and therefore the study of it can be avoided. Generally, the affective domain in the context of Mathematics education refers to beliefs, feeling and moods such as anxiety, confidence, frustration and satisfaction that describe mathematical tasks. The affective domain is generally more difficult to measure and described than cognition (Mcleod, 1992). This is because affect is less precise than cognition.

Mathematics does affect many students and is debilitation (Fitzgerald, 1997). The higher the level of Mathematics anxiety, the lower the performance level in Mathematics (Hembree, 1990). This indicates that the developmental pervasiveness of Mathematics

anxiety. In contrast, a positive attitude towards Mathematics and higher Mathematics achievement help to lower Mathematics anxiety. As the students becomes more successful in performing Mathematics, aversive to Mathematics decrease (Lent, Lopez, Brown & Gore, 1996b), because Mathematics anxiety is so wide spread, many are not afraid to admit to having it.

Mathematics anxiety has been defined as feelings of tension and anxiety that interfere with the manipulation of numbers and solving of mathematical problems in a wide verity of ordinary life and academy situation. Also, math anxiety is an emotional reaction to mathematics based on a past unpleasant experience which harms future learning. Math anxiety can cause one to forget and loss one's self confidence. Math anxiety is very real and occurs among thousands of people. Mathematics anxiety can also be named as math phobia which is gradually increasing among the large mass of pupils.

It has been widely realized that pressure of timed tests and risks of public embarrassment have long been recognized as sources of unproductive tension among many students. So, anxiety is stress, tension and strain brought on to one's body and mind. Math anxiety or fear of math is actually quite common. Math anxiety is quite similar to stage fight. Why does someone suffer stage fight? Why does fear of something going wrong in front of crowed? Fear of forgetting the lines? Fear of being judged poorly? Fear of going completely blank? So, anxiety deals these questions. Math anxiety conjures up fear some type. The fear that one will not be able to do the math or the fear that it's too hard or the fear of failure or which often stems for having a lack of confidence. Math anxiety is the fear about doing the math right, our minds draw blank and we think we'll fail and of course the more frustrated and anxious our mind become, the greater the chance for drawing blanks. Added pressure of having time limits on math tests and exams also causes anxiety for many students.

Anxiety can be categorized into two types namely somatic and cognitive. Somatic anxiety signifies loss control of body; some symptoms are sweaty plans, pain in neck or sick to the stomach. So it is physical aspects of anxiety. Cognitive anxiety signifies loss of concentration, some of the symptoms are negative self-talk, felling of doubt, or mind wonders from test. It is related to the psychological aspects of anxiety. In this context, we can say that the following are the causes of anxiety in mathematics learning.

Test anxiety

It is a learned behavior that may be unlearned. According to the result found by previous researches conducted in foreign country, the following methods often create test anxiety.

- Parents, friends or teachers may pass there bias to the students.
- Students may believe there is a connection between grade and self-worth.
- Fear of alienating parents, family or friends due to poor grades.
- Anxiety may be due to not feeling they are not in control.

Mathematics anxiety

It can be extreme often cause by having a negative attitude due to a previous bad experience. Studies showed that one-half of all students in a developmental mathematics class suffer from of this type of anxiety. The good news is that student can manage these behaviors but they must learn to manage both the stress as well as improve the basic mathematical skills. Studies conducted in national and international level shows that student learn the best when they are active rather than passive learners. The theory of multiple intelligences addresses the different learning styles. Anxiety will be reduced if the teacher apply some typical remedial measure such as lesson are presented for

visual/spatial, interpersonal and intrapersonal, logical/kinesthetic and verbal/linguistic, i. e., lesson must be presented in a variety of ways. Different ways to teach a new concept can be through play-way and acting, co-operative groups, visual aids, hands on activities and technology. Students today have a need for practical math. Math needs to be relevant to their everyday lives. To learn mathematics, students must be engaged not only in rote learning of rules and procedure. Math is often associated with pain and frustration. For examples: unpaid bills, unforeseen debts, unbalanced check books.

In conclusion, anxiety in mathematics is going ahead as a long lasting psychological diseases in the context of Nepal. Math anxiety is a problem for learning mathematics. Learning mathematics having anxious mind causes many phobia.

I have an example: In a higher secondary school located at Baneshwor Kathmandu, there were 300 students participated in HSEB exam in 2070. 230 students passed and 70 students failed. Among them 50 students failed in mathematics. Some of them expressed that they could not solve the problem because in junior class they just did rote learning. They were unable to provide time for mathematics. Specially, they told that they haven't gone through the appropriate approach of learning mathematics. It is one of the factors of anxiety in mathematics. To analyze the causes producing the frustration towards mathematics was the main problem of the study.

Who Made Mathematics Difficult?

Usha Paudel, mathematics teacher, had gone to a public school situated on a Kaski district to each mathematics. Student asked her some critical questions related to the anxiety in mathematics such as: why mathematics is so difficult? Why do we forget mathematical knowledge, which were previously learned? Why do we forget mathematical knowledge, which were previously learned after learning further subject

matter? What can we do after reading it? Such questions pressured her to think toward the anxiety in mathematics. She has different views about mathematics weakness. She expressed her views in order of difficulty in mathematics through simple to complex. After some experience, she concluded the following points, which were responsible to promote anxiety in mathematics as well as difficulty in mathematics.

Traditional thought

It deals about the misconception and bad discussion about mathematics. If someone felt uneasy to study mathematics, she/he should have sprayed bad massage to coming generation. If past generation advocates opposite to the beauty and importance of mathematics, then the coming generation take mathematics in term of negative perspectives. The negative traditional thoughts play the role to promote frustration in mathematics. Hence, it made difficulty in mathematics.

Teacher centered teaching method: Obviously, the mathematical knowledge should be taught by applying student centered teaching approach for effective learning. But most of the teachers apply teacher centered approach. Students exist in classroom in passive form rather than active talent students follow the teacher but doll group do not follow. Then there is high possibility to promote frustrations and therefore increase difficulty in mathematics.

Lack of mathematical laboratory

Mathematics is practical discipline. If someone relates it with real life situation, then the knowledge will be comprehensively understood. We can't find the laboratory in most of the public and private school as well as colleges too. We can find so many practical less problems in mathematics. To each about three dimensional figures, we use

two dimensional boards in classroom. Absence of mathematics laboratory plays the responsible role to promote difficulty in mathematics.

Evaluation system

It deals about the weak evaluation system in academic education. Most of the academy takes evaluation in summative form similar to board exam. Due to the negligence of formative evaluation, most of the students scored weak position in classroom.

Large number of students in a classroom

High pressure of students in a limited class promotes compact situations in physical form. The high density of students in a bench creates unfavorable environment in teaching and learning program.

Poor relationship between student and teacher

There are two factors responsible to increase the poor relationship between students and teachers. It is the thought of difficulty in mathematics and hard role of mathematics teacher. The relationship between student and teacher is directly proportional to the thought about mathematics.

Lack of effective teaching approach in high education: Eight years ago, she had gone to another Campus, to study calculus and asked a question to teachers as where we use the calculus, sir? The teacher replied her “we learnt from blackboard and we are using in blackboard.” Due to the lack of sufficient knowledge about the rational of subject matter, most of the students are unknown about the application. This condition enforces difficulty in mathematics.

Teachers' capacity

A major thing: According to Mathematics Teachers of Junbesi secondary school, Solukhumbu, teachers are responsible to mathematics difficulty. Most of the teachers are not capable to teach mathematics effectively although they have the qualification. The solution is that the related sector should try to increase the capacity by providing different training. For this, it is necessary to add the weightage to fulfill the learning outcomes. School should focus to each mathematics class and student. Subject matter should be practical as well as relevant and so on.

Student's psychology and instructional materials

According to Madhu Rai, Founder advisor of Sumnima Shisu Syahar and child development center, Biratnagar, an experience was presented: He had a past experience about teacher punishment. All students are individually different with respect to different perspectives. Some students catch quickly and some are slowly. He was weak in mathematics in comparison to others. He felt uneasy to study math. He struggled hardly from school level to higher education. He remembered that if the teacher taught him psychologically by using effective materials, he wouldn't become weak in school life. The teacher should be able to teach the child psychologically and should emphasize to use materials. If the teacher neglects these two aspects the outcomes will be the unproductive students without the creative thinking.

Unable to teach understandingly: According to Ram Sunder Deuja, different factors are responsible for it. In mathematics there is fix answer. We can check the answer of problem after solving it. We can identify the steps and processes of problem solving. Mathematics is not a difficulty itself. If the teacher teaches easily, then the

students know easily. Most of the teachers are not able to teach easily and effectively, so the difficulty level was increased.

Students are responsible: According to Sanu Maya Shakya. A mathematics teacher of Madan Smarak Secondary School Pulchok Lalitpur, there are so many factors responsible to affect mathematics understanding. Teachers, students and parents are responsible for easiness and difficultiness of mathematics. The teacher should be intelligence, capable. Effective personality, innovators of new teaching techniques, expert in subject matters and the student should do their exercises continuously. Parents should provide the time for their children to do homework.

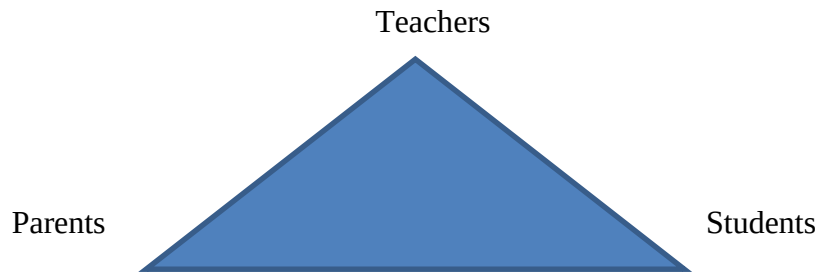

Figure 1: Three dimensional approach of effective learning.

Figure 1 shows the effective composite form creates the suitable environment for teaching and learning. If the degree of relationship decreases, the difficulty level in mathematics increases. Students need, interest, age, intelligence are necessary for effective teaching learning. The following factors promote high level of mathematics understanding. Relationship between teacher, students and parents: Instructional materials, students need and interest, high responsibility of teacher, habit of doing exercises. But these factors are not effectively balanced in school. So the mathematical achievement is found to be poor.

Lack of mathematical language is responsible to promote the anxiety in mathematical learning. In algebra, mathematical languages and symbols were introduced, so it made difficulty in comparison to the other field of mathematics.

Concept Formation in Mathematics

An article was published in Shikshak entitled concept formation in mathematics written by Satya Narayan Maharjan, Resource person, District Education Office ,Lalitpur. He enlightened the need and importance of mathematics clearly. According to him, 'unable to establish the concept of mathematics subject matter is the main cause to promote the anxiety in mathematics. He has provided some techniques to develop the mathematical subject matter in the following manner:

i) by using solid, audio-visual materials
ii) by performing the activities by using manipulative
iii) by conducting discussion on mathematical subject matter
iv) by selecting related contents and involving directly/indirectly on activities
v) by providing the chance to teach the peers
vi) by clarifying the confusion of subject matter
vii) by giving the chance to construct the mathematical materials
viii) by identifying the mathematical nature
ix) by thinking about mathematical self-concept in order to emphasize symbolic language
x) by establishing the base through the lower classes such as pre-primary, primary, secondary, higher secondary and so on. In conclusion he forces on:

In conclusion he focuses on "Emphasizing on practical aspects, thinking subject rather than asking, doing subject rather than looking, writing subject rather than hearing,

learning subject rather than teaching" and "Conceptual understanding is inversely proportional to anxiety in mathematics", Further he put great remark that "Mathematics is not difficult but the conception is wrong".

An interview program is published on Shikshak as an article entitled: mathematics is not difficult but the conception is wrong. This program was interviewed with prof. Dr. Shankar Raj Panta based on different perspectives of mathematics. According to him, there are various aspects responsible to maximize the anxiety in mathematics. Some memorable and important views provided by him in the context of anxiety in mathematics are as follows:

Mathematics is the golden creation of creative mind. Mathematical philosophy is the philosophy of truth. Development of mathematics is the development of civilization. Mathematics plays the foundation role for scientific innovations. It is free from all religious perspectives. Different religions play the vital role to mathematical innovations. Mathematics is the absolute truth in the world. If there is something in the world that force to a man nearer to the god is obviously the mathematics. If there was someone who was created the universe were obviously, the truth follower mathematicians.

To answer the question that: Is mathematics a difficult subject in itself? He replied that: Mathematics is not a difficult discipline in real sense. From the beginning of time there is a wrong traditional concept in the field of mathematics that it is too much difficult subject. This thought is not still broken down in most of the human mind. It plays the role of slow poison (some time may be fast poison) and destroys the further steps of creative mind. Therefore this ultimately results anxiety in mathematics.

Hence, all this aspects that need to be followed to perform the effective teaching/learning activities from the sides of teachers as well as students are not still

maintained. Therefore this weakness plays role to promote anxiety in mathematics. Positive attitude to mathematics is inversely proportional to anxiety in mathematics. An article was published on a journal entitled: Necessity of appropriate teaching approach written by Dr. Tanka Nath Dhamal. He was focused on the effective teaching in order to formulate the mathematical concept nicely. He had provided some points to considered for conceptual learning and if it fails no maintain, Then the anxiety in mathematics will be maximized.

Most of the teachers working in school are unable to play the role of motivators and the impressive personal to promote mathematical interests. Weak teaching techniques are implementing in most of schools, so this played the favorable role to make difficulty in mathematics. Mathematics is not difficult subject but weak teaching approach makes it difficult. The main cause of student's weakness is misconception of society towards mathematics that it is a different subject. Conceptual understandings are not followed and lack of practical exercises creates laziness in doing mathematical tasks. The examples provided by teachers should be relevant in real life. If not, the concept cannot be established and consequently produces anxious feelings.

The following aspects are to be considered for conceptual understanding about mathematical subject-matter (but most of the schools are failed to manage and are going to produce anxiety in mathematics) are as follows:

i) Management of sufficient mathematics teachers
ii) Primary mathematics teachers should achieve knowledge about modern mathematics
iii) Teachers should have skills and techniques to transfer the mathematical concepts

iv) Teachers and related sectors should be interested to focus the mathematics teaching

v) Lack appropriate evaluation/assessment system but most of the school follow practically the traditional evaluation system

vi) Attractive learning environment and teacher's efficiency should be addressed respectfully and so on.

But such conditions are not still found in most of the schools to promote the mathematical performance and achievement from the sides of teachers, school management committee and state. Consequently, there is a gap between knowledge and learner's mind. This results the loss of self- efficiency and finally an anxiety in mathematics.

Statement of the Problem

The statement of the problem should be clear to understand on any kind of research. So, the researcher tried to state the problem related to the study. Since anxiety in mathematics is going ahead as a math phobia psychologically in the mind of students. So, many research questions were raised based on the realities found in educational institutions. This research tried to find that why students are anxious in learning mathematics. For this, researcher has generated the following research questions based on the realities which are found in teaching learning activities. The study was aimed to answering the following research questions.

i) What are the causes of anxiety in higher secondary level students in learning mathematics?

ii) What are the remedial measures to reduce anxiety Mathematics on students?

iii) Does the anxiety in mathematics play leading role to reduce mathematical achievement?

Objectives of the Study

Objective is a striking word to present destination of any kind of task. It fixes the destination to go or to achieve through performance. If we don't mention any objective before performing task, the process won't be successes. This research has also some fixed destination to generate new information in the field of anxiety in learning mathematics. The study tried to explore causes of anxiety is learning mathematics and find possible remedies for reducing anxiety. Hence, the following are the main objectives of the present study:

i) To identify the causes of anxiety in learning mathematics at higher secondary level students.
ii) To identify the role of anxiety to reduce the mathematical achievement of students.

Significance of the Study

Mathematics is considered as a tool in each and every sector. There is no subject which depends without mathematics. If such type anxiety is reduced from students then the students become strong in mathematics. It helps to mathematics students, mathematics curriculum developer, mathematics export and researcher etc. It means the significance of the study deals with the rational of the study. The research is important in order to forecast new information through the chosen topics to teacher, to students, to expert by taking interview about the anxious felling of mathematics. Since everybody knows that there is a great importance of mathematics in the world and existing world

will be paralyzed without considering the role of mathematics but the student of anywhere do not like to study it with the strong interest. To identify the real causes that maximize the anxiety in trigonometry learning were the main rational of this research. It was enough for me to know the students realization of the frustration towards mathematics. For the solution of such problem, we need to search the causes and apply the remedial measure to reduce the anxiety in mathematics learning. These contexts are only the sample of whole contexts realized by me. This study is also significant for the following:

i) This research would be helpful for students, guardians, parents, counselors, teachers, curriculum designer, coordinators and administrators to find information about the causes of anxiety.
ii) It would be much helpful for students to identify causes of mathematics anxiety's contributing factors and its effect to have good potential in learning mathematics.
iii) Teacher has a significant impact on the success of students in their class.
iv) This research would help students to learn math without any anxious feelings by taking the remedial measures.

Delimitations of the Study

It deals about the study area as a boundary. Due to the limitation and resources constraint to the study, it couldn't be conducted the research on the large area. The delimitations for this research were as follows.

I. The study was based on higher secondary school student.
II. This study was based on only two higher secondary schools student of Kathmandu valley
III. The study was concerned only about anxiety in students that causes.

Definition of Terms

The following terms are used in the research with the mentioned meanings.

Math Anxiety: It is the fear about doing the math right, our minds draw a blank and we'll fail and of course the more frustrated and anxious our mind becomes, the greatest the chance for drawings blanks.

Somatic Anxiety: It signifies lose control of body; some symptoms are sweaty plans, pain in neck or sick to the stomach. So it is physical aspects of anxiety.

Cognitive Anxiety: It signifies loss of concentration, some of the symptoms are negative self-talk, felling of doubt, or mind wonders from test. It is related to the psychological aspects of anxiety.

Test Anxiety: It is a learned behavior that may be unlearned. According to the result found by previous researches conducted in foreign country, the following methods often create test anxiety.

Chapter II

REVIEW OF RELATED LITERATURE

This chapter deals about the review of related literature to the study and framework for the study. A review of related literature is the source for the further study of the research task. It helps to conduct the research programs and gives the better idea to survey the research questions. It helps to conduct the new research in a systematic manner by providing the general outlines of the study. The review of related literature involves the identifications and analysis of documents related to the study undertaken. The previous studies can't be ignored because they provide the foundation to the present study. Some related literature were studied about the chosen topic. This chapter of the research deals about the theoretical literature, empirical literature, theoretical framework and conceptual framework for the study.

Empirical Literature

There are very few researches about the topic, "Anxiety in mathematics at secondary school student "in the context of Nepal done in qualitatively. But some of the partially related researchers have been conducted about the affecting factors of higher failure rate in SLC examination. So, the researcher tried to link the major causes of higher failure rate with anxiety in mathematics. Some of the researchers reviewed in this purpose as a literature related to research topic are presented below.

Scarpello (2005) conducted a research for the completion of his doctor of physiology from Drexel University entitled "The effect of mathematics Anxiety on the course and career choice of high school vocational and technical Education Student." He generated interesting findings. On this research report it was found that many factor

influence a student's course and career choice, self-efficiency and peers. There have been explained about the interesting inversely proportional relation. The research concluded that loss of mathematics self-efficiency is the major factors to promote the anxious feelings towards mathematics. Students mathematics related attitude may strongly affect to like and dis like of mathematics. Parental encouragement in Mathematics was found to significantly influence students; earning experience and attitude towards mathematics. Parents support and negligence to their children seems to be positive and negative impact in their career. Mathematics anxiety and career choice are also interrelated. Anxiety in mathematics directly affects the course and career choice. Students should be motivated from the various factors. Environment affects to the student for various ways. They may lead to reduce or to promote anxiety in mathematics which harms or fertile the career choice and so on.

Dulal (2008) conducted a research entitled Causes of Anxiety in mathematics learning (A Case Study). He conducted with the purpose of to find out the causes of anxiety in mathematics learning at secondary level students and to suggest remedial measure in order to minimize anxious feeling to school students. He found that the students, teacher, school administration, school staff, school management committee, weak rules and regulations provided by government, peers, contents, curriculum, economic and educational condition of family and so on are responsible for anxiety of mathematics in some high or low classes. The effect of mathematics anxiety on mathematics efficacy is such that as mathematics anxiety increases mathematics self-efficacy decrease and vice versa. These two constructs are interlined and inseparable. Each directly influences the other two and these two together directly influences course and career choice.

High level of mathematics anxiety is and low mathematics self-efficiency can lead the students to avoid mathematics related careers or higher level mathematics

courses in high school. The student's career interest may be strong enough to counter the adverse effect of mathematics anxiety and low mathematics efficiency on their career choice or the student's career choice may be adversely affected by mathematics anxiety and mathematics efficiency.

Ramirez, Gunderson, Levine and Beilock (2013) conducted a research entitled Math Anxiety, Working Memory, and Math Achievement in Early Elementary School. They explored whether math anxiety relates to young children's math achievement. One hundred and fifty-four first- and second-grade children (69 boys, 85 girls) were given a measure of math achievement and working memory (WM). Several days later, children's math anxiety was assessed using a newly developed scale. Paralleling work with adults they found a negative relation between math anxiety and math achievement for children who were higher but not lower in WM. High-WM individuals tend to rely on WM-intensive solution strategies, and these strategies are likely disrupted when WM capacity is co-opted by math anxiety. They argued that early identification and treatment of math anxieties is important because these early anxieties may snowball and eventually lead students with the highest potential (i.e., those with higher WM) to avoid math courses and math-related career choices.

Beilock, Gunderson, Remirez and Levine (2009) studied fear and anxiety about mathematics entitled Female teachers' math anxiety affects girls' math achievement. They found that early elementary school teachers in the United States are almost exclusively female (>90%), and we provide evidence that these female teachers' anxieties relate to girls' math achievement via girls' beliefs about who is good at math. First- and second grade female teachers completed measures of math anxiety. The math achievement of the students in these teachers' classrooms was also assessed. There was no relation between a teacher's math anxiety and her students' math achievement at the

beginning of the school year. By the school year's end, however, the more anxious teachers were about math, the more likely girls (but not boys) were to endorse the commonly held stereotype that "boys are good at math, and girls are good at reading" and the lower these girls' math achievement. Indeed, by the end of the school year, girls who endorsed this stereotype had significantly worse math achievement than girls who did not and than boys overall. In early elementary school, where the teachers are almost all female, teachers' math anxiety carries consequences for girls' math achievement by influencing girls' beliefs about who is good at math.

Theoretical Literature

The theoretical literature of the study is very close to the background section. Math anxiety is emotional reaction to mathematics based on a past unpleasant experience which harms future learning. Mathematics anxiety has been defined as feeling of tension and anxiety that interfere with the manipulation of numbers and the solving of the mathematical problems in wide variety of ordinary life and academic situations. Math anxiety can cause one to forget and loss one's self confidence. Usually math anxiety can stems from unpleasant experiences in mathematics. Typically math phonics have had math presented in such a fashion that it led to limited understanding. Unfortunately, math anxiety is often due to poor teaching and poor experiences in math which typically leads to math anxiety. Many of the students have encountered in math as opposed to actually understanding the trigonometry math. When one tries to memorize procedures, rules and routines without much understanding, the trigonometry's formulae are quickly forgotten and panic song sets in. The strength of the relationship between anxiety and performance varies from study to study with correlations from extreme negative to positive values. In order to reveal the sources of this inconsistency, a series of meta-analysis was conducted using the Schmidt Hunter algorithm for effect size.

Since anxiety in math signifies negative attitude towards mathematics, so there may be various casual factors to motivate it. On the basis of past researches conducted in foreign countries, it has been concluded that the following causes responsible to motivate /produce anxious feelings to the students.

i) Pressure of time/test deadlines, public embarrassment / public exposure
ii) Imposed authority and ineffective teaching methods.
iii) Incorrect responses and loss of student's confidence.
iv) Passive situations of learning and useless of learning theories.
v) Presentation of lesson in a constant ways.
vi) No implementation of practical mathematics.
vii) Diverse condition of math knowledge with relevancy of life.
viii) Negative environment to the student in exploring, conjecturing and thinking.
ix) Positive practices of rote learning by avoiding other experimental methods.
x) Negative environments in students own homes.
xi) Blocked from professional and personal authority (according to the Sheila and Tobias).
xii) Negative impression taken from past generation such that math is often associated with pain and frustration.
xiii) No habit to use learned mathematical knowledge in everyday life.
xiv) No time devotion from parents to math seriously and creatively.
xv) No effort to create enjoyable feelings in student's mind because once young children see math as fun, they will enjoy it and joy of mathematics could remain with them throughout the rest of their life.
xvi) No effort to look mathematics up on in a positive light from the sides of both students and teachers.

On the basis of the various definitions of mathematics anxiety given or announced by different researcher in different period of time, we can theorize the concept of mathematics anxiety as a researchable discipline. We can generate so motivating factors to mathematics anxiety by the deep and thinkable study about it. Some of the theoretical perspectives of anxiety in mathematics had been explained in background section. So I would like to terminate the writing under this topic.

The researcher studied journals for related articles to collect the causes about the anxiety in mathematics learning. The researcher found the journal named shikshk exactly related to the research topic. The views expressed by different scholars through the articles were collected as research and presented as follows:

Theoretical Construction of the Study

This deals about the theoretical framework for the prescribed study. Since it is the qualitative type of research, so we need a theory to establish the research findings in a valid way. Beings the qualitative nature of the study, it is more useful to use the social learning theories to draw the actual results. To conduct the research on anxiety in mathematics, it would be difficult to use experimental as well as statistical approach. The main factors promoting anxiety in mathematics are supposed to be the social causes and verbal responses so it is hoped to be good by using social theory derived by different theorist. To conduct this research with the aim of drawing real fact about the motivators of anxiety in mathematics, the following theoretical bases were taken: Bandura's general social cognitive theory and Dienes's learning theory on mathematics. On the basis of this mentioned theory, researcher was hopeful to draw the real image to fulfill the intended objectives. I tried to draw raw information by the real directions of these theories. The brief introduction about the theory is explained below:

Bandura's General social Cognitive Theory

Bandura's general social cognitive theory is perhaps the most important theoretical underline for entertainment education. This theory was developed from experimental psychological studies which demonstrates how children learn and imitate from the modeled behaviors. It is general theory of human behaviors. This theory is widely used not only in education but also in health promotion campaigns, business, sociological and communication research. Bandura stresses the influence of symbolic modeling derived from TV, films, and other visual media, etc. Bandura (1977) argues that "Learning would be exceedingly laborious, not to mention hazardous". If people had to rely solely on the effect of their own action to inform them what to do. Fortunately, most human behaviors are observationally thoroughly modeling: from observing other one forms an idea of how new behaviors are performed and on latter occasions this coded information services as a guide for action because people can learn form before performing any behaviors. Bandura stressed on the concept of self-efficiency and collective efficiency is incorporated in numerous studies in different concepts. Bandura (1995) defined self-efficiency as the belief that people have in the ability to exercise control over events that affects their lives. Human behavior is affects by self-efficacy belief through cognitive, motivation, affective and decisional processes.

According to Bandura (2003): among the mechanisms of human agency none is more central a pervasive than beliefs of personal efficacy. Whatever other factors serves as guides and motivation, they are rooted in the core belief that one has power to produce desired effect by men's action, otherwise one has little incentive to act persevere in the face of difficulties. Bandura's studies concluded that enrolment causes behaviors but that behavior cause's environment, tool. He referred to is idea as "reciprocal determination," believing that an individual's action and the action of word. This theory will provide the

main theoretical base to conduct he research nicely. Under this theory it will be focused on self-efficacy is the root to promote mathematics anxiety. There may be so many causes on different sectors to loss self-efficacy in order to promote mathematics anxiety.

Bandura (1989) defined the efficacy beliefs as the product of a complex process on self-persuasion that relies on cognitive process or diverse sources of efficacy information. According to Bandura (1986), self-efficacy is a person's judgment of their capability to organize and carry out a course of action required to attain a desired type of performance (Pajares & Miller, 1995). Form the general social cognitive theory (GSCT), a person's choice of behavior and how much effort they will expand and for how long they will sustain that effort in spite of obstacles and adverse experiences is governed by one's perception of self-efficacy (Bundara,1977). The person will have lower performance (efficacy) expectation if they believe that are not able to be successful due to personal inadequacies rather than due to particular situation they find themselves (Bandura,1977).

Self-efficacy expectation are independent of performance and are a better predictor of behavior than is the actual capability of person because they determine what the person will do with the knowledge and skill they have. Thus the more efficacious a student is, the wider the range of mathematics interest. A student with a strong sense of efficacy and perceived value of an outcome may have more interest towards mathematics anxiety. The student's learning experiences significantly influence self-efficacy and outcome expectations (Ferry et.al, 2000) and ability or aptitude will affects a student's academic performance (Lent et al,1994). A students performance in mathematics (Barre 1999, Lent et al, 1999b) will directly affect self-efficacy attitude and outcome expectancies, grades and indirectly affects course enrollment intensions. The stronger the mathematics self-efficacy expectation a student has the more likely the student will

major in mathematics or science in college (Ferry et al, 2000). This academic self-perception along with motivation and self-regulation according to Mc Coach and Siegle (2001) appears to be a stronger predictor of academic achievement that does the students attitude towards school or teacher. They go on to say students who have high self-motivation and self-regulation and positive academic self-perception more likely to be high achievement then the students with the lower academic self-perception, motivation and self-motivation. As the student achieves success in mathematics her/his sense of efficacy will began to rise which is true will lead to increased interest in mathematics, as a result, the mathematics anxiety will be reduced. The following are the two technical terms considered as the self-efficacy.

Math self-Concept

Byrne (1984) defined it as those attitude felling and knowledge has once has concerning their skill abilities appearance and social acceptability. Self-concept influence the choice of acuities, effort expanded persistence thought patterns and emotional reaction of the individual (lent et al,1999b). students will poor attitude towards mathematics often have a low self-concept feeling of incompetence a perpetual lack of success in mathematics and mathematics anxiety (Sherman and Christian, 1999) when a positive self-concept and attitude toward mathematic is associated with lower mathematics anxiety (Fitzgerald, 1997) .

Bandura's (1986) work in the area of self-efficacy expectation and self-concept also has implications for understanding test anxiety. Bandura state that people engaging in new tasks make appraisal of their performance capabilities on the basis of of their knowledge of how they have done in similar situation. Bandura's (1986) conceptualization of self-concept as a global or composite view of self gives to the

possibility that self-concept develops put of more specific feelings, such as self-efficacy. In the context of the current study such a conceptualization suggests that perceived self-efficacy influences math self-concept. Relationship of math self-concept and test anxiety with achievement were also been found. Benson et al.(1994) and Zeidner (1992) found that students self-evaluation of their math ability had a negative influence on test anxiety. Benson and her colleagues also reported that math self-concept had a significant negative effect on test anxiety for women but no for man. On the basis of the research cited above, math self-concept was hypothesized to affect perceived self-efficacy in statistics, achievement score in a statistics class, and both general test anxiety and statistics test anxiety.

Conceptual Framework

This section deals about the conceptual framework for the research. It deals about researcher's own concept to conduct the research in an original way. The conceptual framework was established on the basis of research topic. Possible areas to fulfill the objective and theoretical framework. Since the study topic is; "A study on anxiety in mathematics found in secondary school student", so the demand of this study was supposed to be those factors which exactly fulfill the objectives.

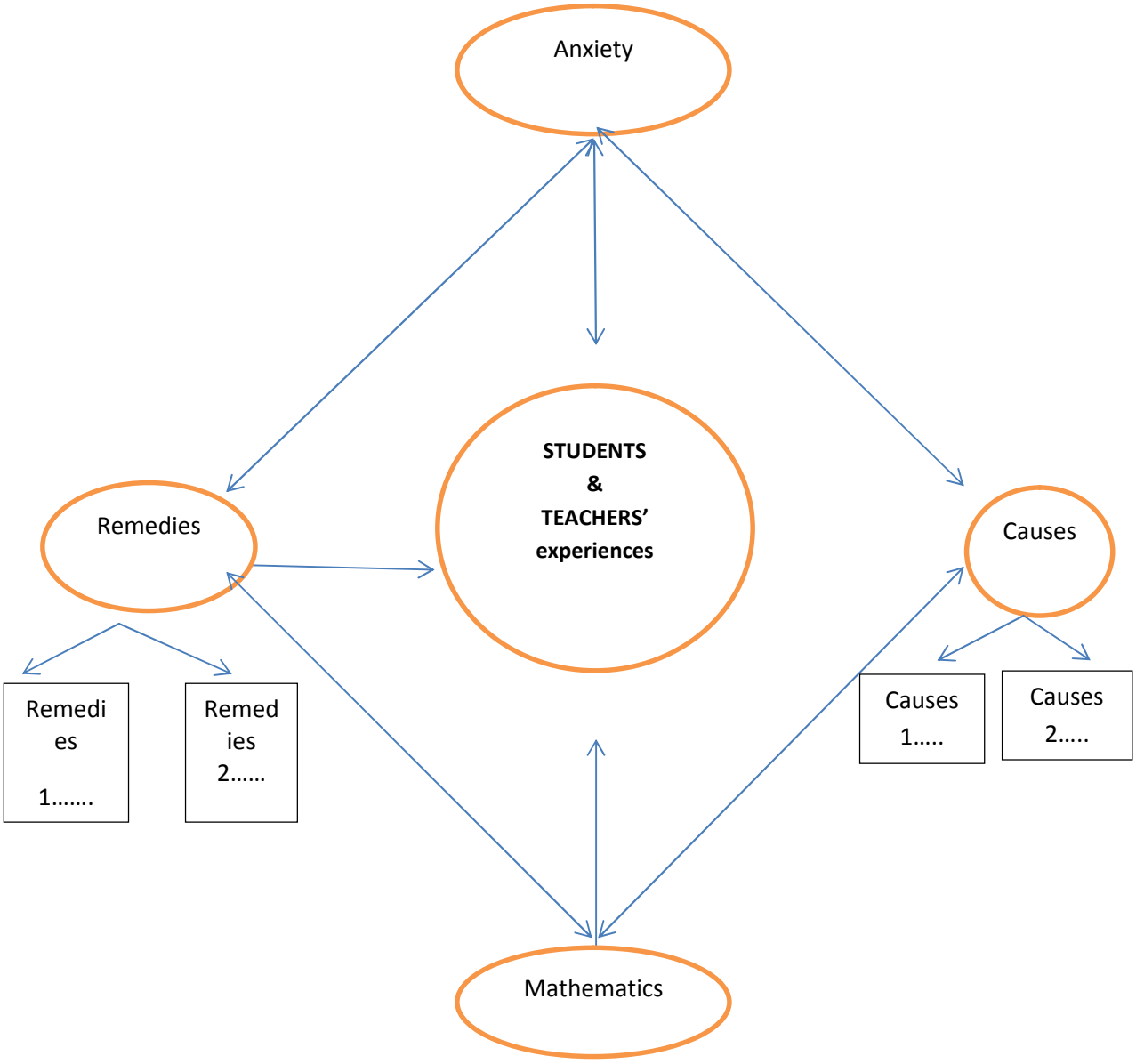

Fig 2: Conceptual framework of the study

Mathematics needs to relevant the student's everyday activities. Similarly students use mathematics in problem and solution of book as a rote learning. So, learning of mathematics takes short term memory and they feel anxiety. For the solution of these problems I collected the possible remedies and causes for anxiety in learning mathematics.

Why students are anxious in learning mathematics and how can the anxiety be minimized is the main concern of this research. This research was based on the responses of teachers and students and observation of the classroom and exam activities. The causes of the anxiety were categorized and the possible remedies were suggested with a view to minimize the anxiety in mathematics learning.

In the study, it was found that the reasons for anxiety in mathematics learning can be grouped into students related, teacher related and administration and society related factors. Some causes are of mixed concerned. Negligence of homework, copying homework from others is related to students' behavior. Teaching by considering learning ability of individual students, putting concern to each student, creating optimal learning environment, organizing different mathematical program and motivating students to participate are teacher related factors.

Creating sound environment in the classroom, examination and providing learning opportunity and funs and joyful learning requires joint efforts of students, teachers, administration and society. The research is exploring these factors which directly and indirectly helping in reducing/increasing the level of anxiety in mathematics learning.

Chapter III

METHODS AND PROCEDURE

This chapter deals about the methods and procedures that were used to conduct the research. There are various methods to find new knowledge about the related topics of research. Selection of suitable method is determined by the predetermined research question. Methodology is the important aspect of research. It deals about the way that how the research is going to be conducted. Among the various research methods, the following methodological aspects are followed by the researcher in this research.

Research Design

This is a case study about the causes of anxiety in Mathematics. The study was based on descriptive, analytic and explorative research design. It is descriptive because all the expressed logic, views and opinions obtained by respondents were subjective. It is analytic because all the expressed views related to the causes of anxiety in mathematics was realized with the possible factors which were directly or indirectly attached in the poor activity of the students. It is explorative because this research focused to explore the major causes of anxiety in mathematics learning.

Selection of the Research Site

This research focused on identifying the major causes of anxiety in mathematics learning. The researcher selected Kathmandu and Lalitpur district as research site. Two districts were selected with a view to obtain diversity in terms of districts.

Selection of Researched School

Two higher secondary level schools namely; Vishwo Niketan Higher Secondary School, Tripureswor, Kathmandu and Sagarmatha Higher Secondary School, Jawalakhel, Lalitpur were selected for data collection. Short description of each of the schools is presented here.

Vishwo Niketan Higher Secondary School

Vishwo Niketan Higher Secondary school, Tripureshwor Kathmandu started to run its higher secondary education from 2049.This is community based school. There are 1020 student studying currently. The community surrounding the school is medium (tending low) rather than high status economically. There are so many diversities in terms of racial status and with respect to caste such as Brahmin, Chettry, Tamang, Newar as well as Dalit. The school has 52 members including teaching and non teaching staff. There were 30 students in grade XI and 20 students in grade XII who selected mathematics as major subject in this school.

Sagarmatha Higher Secondary School

Sagarmatha Higher Secondary school, Jawalakhel, Lalitpur started to operate its higher secondary section from 2065.This is institutional school. There are 520 student studying currently. The community surrounding the school is medium rather than high status economically. There are so many diversities in terms of racial status and with respect to caste such as Brahmin, Chettry, Tamang, Newar as well as Dalit. The school has 32 members including teaching and non-teaching staff. There were 15 students in grade XI and 10 students in grade XII studying mathematics.

Sample of the Study

One private Higher Secondary School and one Public Higher Secondary School from Lalitpur and Kathmandu respectively were chosen to investigate the anxiety of students in Mathematics learning. The researcher used simple random sampling to select students from each of the higher secondary schools. One Mathematics teacher from each school was selected as participants of the research. The following table shows the number of research participants.

Table 1 Number of Research Participants

	School A		School B		Total
	Boy	Girl	Boy	Girl	
Students	2	2	2	2	8
Teacher	1	0	1	0	2

Tools of the Study

The research was carried out on interview and observation. The tools and techniques be used in the research are described below.

Interview guideline

The researcher prepared separate interview guideline for teachers and students to explore the causes and sources of anxiety in learning mathematics.

Observation form

To observe the process of developing anxiety in the class and behaviors of anxious students in teaching learning process, the classes were observed and such behavior were recorded by using class observation Performa.

The researcher's visit in two schools can be summarized as given in the following table 2.

Table 2 Summary of Field Visit Task and Frequency

	Area of Data collection	VSNHSS	SHSS	Total Episodes
1	Exam observation	1	2	3
2	Class observation	2	2	4
3	Teacher's interview	2	2	4
4	Student's interview	3	3	6

Data Collection Procedure

Researcher visited each school to interview with teacher and students. A field note was prepared be the main documents for collecting data. Interview will be recorded in suitable media (Mobile). The data collection was done through the interview guidelines performed on teachers and students. Class and exam observations were carried out by researcher with prepared guidelines.

Data Analysis Procedure

Simultaneous data collection and analysis was used as the practice of writing memos during and after data collection, the use of some sort of coding, the use of writing as a tool for analysis, and the development of concept and connection of one's analysis to the literature in one's field (Given, 2008, p. 186). Different causes were listed based on the interview data of teacher and students. Different themes were prepared to explain these anxieties. Similarly different remedies of causes were listed based on the interview data of teacher and students different themes prepared to explain these remedies. The data were analyzed on the basis of the related theories.

Chapter IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the analysis and interpretation of data. This is considered as the main body of the research. Being the main body of research, it can be seen as the practical aspect of study. On the basis of the intended objectives and constructed tools for collecting information, researcher visited to research field for grasping current data.

As the research demands the causes and remedies of anxiety in mathematics learning in higher secondary level, the causes of the anxiety are presented at first and then remedies are presented herewith in this chapter.

Causes of Anxiety

Data were collected and analyzed with classroom observation, exam observation, interview from students and teachers in order to find the causes of anxiety in mathematics learning. So the obtained information were analyzed under the following headings:

Data Analysis from Observation

Different class observations were carried out in higher secondary school students from different perspectives. In classroom observation, teacher's observation was also carried out in terms of teaching perspectives. In class observation, the researcher concentrated her attention to grasp the current situations surrounding the classroom. The exam observations were conducted on the sample schools with the aim of drawing the information in testing situations. The main objectives of such observations were to be familiar with various factors affecting students in the exam. These schools gave me

chances to supervise the exam as a guide by providing the rights parallel to those teachers who were working these schools. The Episodes I to IV are prepared based on the observation of exams and these episodes are presented here.

Episode I

When I entered into the room for observing exam with invigilator the room was the classroom. I counted the heads and found there were 35 students sitting for the examination. The noise and looking to each other started as soon as the invigilator distributed question paper and some of the students even did not complete reading all questions. Only 5-6 students started writing the answers and other students were delayed writing till around ten minutes. One student then started to ask with friend near him to find the correct answer. I was with my notebook and pen writing each activities and students were looking at me for another 15-20 minutes. Most of the students, around 20 students were able to pass an hour by looking at me, their invigilator and friends. Some of them (around five) started to seek help from their friends and some of the students (around five) started to show their emotions that they left the hall without doing any math problem. Around five students were attempting some problems many times but not successful in solving.

After an hour completion, some of the students went toilet for 3-4 times. I could guess that they either go to ask with friend or to kill the time. Some of the students started to cheat. I did not react anything with their action and the cheating rate was increasing. There was noise in the room while students cheated each other and tried to get help in copying from other. When invigilator found students cheating she threatened to out him from hall. The student used to beg sorry in polite manner and she excused.

Students were diverted physically as well as mentally when the supervisor left the exam hall. Discipline was not maintained from students. They went to toilet for cheating rather than toileting. Mental harassment was credited being weakness due to the negligence to study. Lack of coordination between question paper and content taught in class was seen. Examinees felt confusion on question paper. It was high possibility to get marks freely in the name of untaught questions. Norms of exam could not been maintained. Due to loss of discipline from the side of students as well as teachers, the environment was not maintained effectively. If a student/teacher wants to maintain the norms from varieties of angle, obviously he/she would become fail because of destroy of team spirit. If the cheating habits will be addressed then students would get attention to the classroom learning activities.

In conclusion, the importance of examination was not understood by the students. Students were highly depended on cheating. Parasitism condition was seen among the students. Ineffective question paper was created problem for understanding. Weak administrative role was found in sample school. Consequently, the students were tending to lose the discipline. As a result of the environment in the examination, the classroom activities and learning activities of students are guided. In such situation students are not regular in their mathematics study and worry only how to score pass in examination. After a long duration, they do not understand mathematics in the classroom and are worried about their mark. As a result of environment in examination is helpful in increasing/reducing anxiety in mathematics learning.

Episode II

The exam observation in another selected school was done as similar manner to that of the first school. The following activities were observed:

The environment was created nicely in the beginning of the exam. Some students followed their relations for asking support from friends. Some students read question frequently when they could not answer. They felt that the questions have never seen. One student came after 20 minutes when he had left the exam hall for toileting with the question paper. It was highly possible to cheat by strong and physically fitted students because he thought that if the supervisor disturbed him to cheat, then he would react negatively. A conversation between the researcher and the student of grade XI Rita Raut was derived after the exam can be narrate in the following manner:

Researcher: why do you need to cheat in exam?

Rita: I cheated in exam for practice of Board exam.

Researcher: Is it good to cheat?

Rita: Did you forget your cheating behavior in school life, mam? You also passed through cheating, so please don't take our cheat.

Researcher: Did you see my cheating behavior?

Rita: No.

Researcher: Why did you blame me?

Rita: Sorry Mam, you were talented, so it was not necessary to cheat but we are doll. It was our necessity.

From the above discussion we can say that there are many Ritas. Some students discussed negatively with teacher about cheating. They told that cheating is the right for them to pass the exam with studying. Some students compared teacher with their

physical structure such that they would be able to fight if the supervisor disturbed him on cheating.

This showed that cheating is the right for students to pass the exam rather than the studying seriously. They converted cheating in terms of the tool for solving the problem of studying without understanding. As a result they study in the next level/class they will face problems of understanding problems and they lack interest in learning mathematics.

Episode III

This episode of exam observation was performed on the second sample school. In this observation, the following activities were observed:

Some students had interchanged their seats to arrange place such that they created the favorable environment for cheating. The school fixed the time to go to toilet one hour later of starting exam, so most of the students waited the time for toileting but the hidden cause is to cheat rather than toileting. Those students who were physically fitted never respect teacher. They changed their place according to the favorable situations. Students were tackling out of discipline. They extremely rejected out of school teacher. As researcher, I entered into the exam hall, but the existing guide left. I tried to control the room but became failed. I felt that it was valueless. The group of cheated students was large but the group of good students was small in number. By the disturbance of cheated, good students didn't get nice environment to write independently. I suddenly saw a book cheated by a student, named Santosh Rai, and the invigilator tried to take this book from him, but he didn't give. The following discussion was generated:

Invigilator: Give me that book.

Santosh: No, mam.

Invigilator: This is your exam but not the time for doing homework.

Santosh: I know mam.

Invigilator: If you know it, why did you cheat?

Santosh: please mam, I'm copying one problem from trigonometry, I can't do it. So I want complete it.

The Invigilator tried to grasp the book from him but he suddenly stopped.

Invigilator: You don't give me this book?

Santosh: I'll give mam, just 5 minutes later.

Invigilator: You neglected my values. It is better to tell to your principal ok!

Santosh: No, mam. I'm telling you seriously mam, I will be failed if I lost the cheating opportunity now. Please mam, help me to pass in this exam.

I thought about this achievement level and discipline maintained by school. Most of the students cheated openly in classroom. The norms and values of exam were killed. Santos was only the sample student, more than 89% of students cheated openly. The discipline was not maintained by students and teachers in exam hall. The weak discipline was created negligence to study hard. Exam is similar to homework doing. The teacher and students did not take exam as exam. The teacher played the role only as a formality but didn't play the creative role. The exam was not seen as exam. The group of teacher were failed to motivate the students through the exam and the students were failed to use the exam as a chance of improvement.

Episode IV

This episode of exam observation was conducted surroundings the whole school. This episode was limited within and outside the school exam hall. Researcher played the role of running guard in school periphery. Environmental condition of school was observed inside the exam hall as well as grounding situations. The behaviors of examinees were observed in testing and test finishing situations. The following activities were observed.

The environmental condition of classroom/exam hall was continued similar to the previous episodes. When student has just finished their own exam, they tried to help their liked friends by showing their answers sheets. When the teacher told them not to show such behavior, they rejected the teachers directly. Some of the students used notebooks for cheating. One student of major English Anish told to the researcher as: you do not find any student who doesn't cheat in this exam. Is there anybody in Nepal who doesn't earn black money? You will also earn black money in your future. Everybody cheated here we also cheated. We need to get chance to cheat. Don't take our cheat.

Researcher: Is it good to cheat?

Anish: No, but everybody cheated here.

Student discuss (negatively) directly with teacher to defense the cheating behavior. They think that cheating is the demand of age. It is not the time for reading effectively. Student transposed the exam copy from one place to another for helping their peer friends. Students were out of control. School administration failed to maintain the discipline. Loose administration and weak role of principal was seen. The researcher never saw such behaviors from the side of students, which were not memorable. Researcher had no such words to express these naughty situations verbally because one student of economics Kumar Khadka took a guess paper from the front side of exam hall

by neglecting the teacher's value and exam norms. Supervisor tried to take this guess paper but he didn't give.

Lack of strong coordinate and teamwork spirit among all teachers, whole school system is tending to loss its prestige as well as going to produce unproductive manpower. Such conditions created the environment opposite to perform the teaching and learning program effectively. After analyzing all the aspects explained above may force to promote frustration extremely to mathematics also to other subjects. So we can conclude that this is the cause to produce anxious feelings, ultimately the anxiety in mathematics.

Student told that cheating is good. They have gained the concept of cheating strongly rather than studying seriously. Cheating is increasing as the culture besides studying. Weak teamwork spirit among teaching staff was seen. As to promote good learning environment the administrative role is important so that students get important of their study and get chance to study regularly. As a result this will help to reduce the level of anxiety in mathematics learning.

Class Observation

Class observation was carried out with the aim of looking at the anxiety in the learning process. Different episodes based on class observation are presented here. Researcher met different type of students varies individually and became friends of them because it is needed to draw the fresh information which were limited within them.

Episode V (Grade XI)

When I requested teacher to provide me opportunity to observe his class, he said simply welcome to my class. The teacher welcomed this day also to observe his class. I entered into the classroom with him. When we entered into the classroom students were busy

with their stuffs. But immediately they shot their stuffs and concentrated with the teachers' instruction. He asked what we did yesterday and based on some students' response he started the today's lesson. But he did not write any information about lesson in the board.

Teacher started to teach question number six. When he read the question by picking a book then I knew that it was the problem of combination. He noted figures in the board to be used. The lesson is of combination and used the formula of combination in repeated case and solved the problem. He did not explain why it is a problem of combination and not of permutation. He just wrote the formula to be used in the reparative case of numbers. The teacher asked students to do questions seven and some did in the same way and some could not. After some times he again asked all students to be concentrate in his explanation. He once again read the questions and noted important figures in the board with the symbols of the formula. He wrote formula and inserted to values and calculated the value and obtained the solution. He then did question number eight which is of another type. He mentioned it as a complementary combination and derived the solution as the proof. Then he asked to do question nine and ten as homework and went out from the class. I also came out.

The way of teaching is more teacher-centered and students were busy in copying from the board and trying to remember the formula and when to use the formula. He did not focus to content by nature. That means he did not focus structure of mathematics. He followed the lecture method rather than the student centered. The effective techniques weren't provided to active the students for learning. The comprehensive teaching wasn't performed by teacher. Students did not get chance to think why they have to use the formula of repetitive combination. The teacher did not care who understood and who did not. Every student copied in the same manner. Students were busy in writing rather in

thinking and discussion. The teacher's role can be passive in term of activeness in teaching.

Being the passive role of teacher students couldn't be motivated for effective learning. Due to the absence of comprehensive teaching, the main themes of problems weren't mentioned clearly according to whole to part approach such that the students were unable to understand the critical concepts. When students need to know the problems by heart without understanding, then it is one of the major sources of anxiety. Students were worried on the concern that how to remember the whole problems of the book. If they forget, then they do not have anything to do in the exam. They are worry about their habit of forgetting. The teacher centered classroom is one of the sources of anxiety in learning mathematics. In order to reduce anxiety, more student centered activities are to implemented.

Related to Facility

Physical facilities are helpful in creating learning environment and facilitate in the learning process. Physical facilities such as desk, bench, whiteboard, etc. were admirable and sufficient for students. But students sat on desk by neglecting. Instructional materials were available in the class room but weren't used. The environment of the classroom was failed to motive the students for learning.

Students Related Factors

Passive role were played by most of the students in the classroom. If the teacher asked to students about the subject matter, they would have given the answer blindly without mentioning that it is right or wrong. Students rotted the statement of problem related to content. Teacher openly asked the question that "what is chord (in Nepali it is

called jiva)?" one student Ujjwal, who was not serious in study, replied that chord means hajurbuba. The student sit on back side disturb to front side by throwing paper, rock, rocket etc. while teacher asked question, students start to laugh. Students never do homework. Student entered and exit any time while teacher teaching in classroom. Out of track condition of students were found. Students did not realize that it is time for study.

Because of the students' value to mathematics education, they are not valuing their learning activities. They are responsible themselves for the performance. Weak performance of students was observed. They did not think that achieving quality education implies the transformation of life from weak to good position. Students are highly responsible to promote anxious feelings in their mind. Teachers played the second position. The students are to be made responsible and they need to think for their future. Students are to be motivated to learn mathematics in their classroom.

Episode VI (Grade XII)

It is the class of the second school. It is in the third period. When we entered into the classroom, students welcomed us as teachers. The teacher introduced me as teacher and shared my objective. The teacher started the lesson by writing title "Integration" in the board. The lesson was the continuation of previous class and so started immediately with a problem.

Teacher gave a problem related to Integration to the students to solve by them. Most of the students were not sensitive in classroom. Students were unable to understand the problem clearly. They lost self-confidence to use appropriate formula as they knew it. They weren't initiated to do further problems although they finished previous one. Students were passive form. All students didn't do problems as homework. Researcher

asked to the students why didn't you do your homework? They replied: we couldn't do these problems because we didn't understand trigonometry. Here also mixing trigonometry. In the guide book, there is also not given such question answer. So we haven't done homework mam." They were confusion about given conditions and those operations. Which were needed to find? One student Susmita went to solve the problem in board, and the following activities were observed. She felt hesitation in front of board. She was in confusion about destinations of problem and she felt difficult to abstract from concrete. Teacher did not clarify the way of solution properly. Weak students followed to talent with the aim of copying without the aim of getting knowledge. They never showed the copy to teacher because they felt hesitation from own weakness.

Teachers support and encouragement in the learning process is crucial. Students try out is to be taken positively and in the try out, teacher's clues and cues play important roles. It was found that the student's self-efficiency level is very poor. There was weak coordination between teacher and students. Students do not know about the real meaning of mathematical concepts. Students were needed to encourage in the situation so they were able to understand the problem easily. The main problem is that one area of mathematics (such as trigonometry) is making difficult in learning another area (such as Integration) of mathematics. Teachers and students are not making such connections. This in a long run resulting the anxiety in students.

Episode VII (Grade XI)

Most of the students didn't finish their homework because they were unable to do. The discipline among the students was not maintained in classroom. Teacher didn't follow student centered teaching method. Materials were not used. Mind divergent situations to student were observed. Students were unknown to the destination to the

mathematical problems. The comprehensive and experimental study weren't conducted in classroom. One student Susma asked to the researcher: how are you became so talent in mathematics? Please! Tell us the causes. Researcher realized that they were worry about their own weakness and they were searching the way to reduce such frustration. Another student Ranjita gave the answer of the Susma's question suddenly that the weak base is the main cause of creating anxiety on students. Effective teaching couldn't found in class because of the uncontrolled situations. Most of the students were busy on making noise.

Lack of concentration was seen in the classroom. Lack of motivation to promote student's mathematical interest (was performed by teacher). In class student were busy to fulfill the autograph. Effective teaching was failed from various sides such student's negligence to study, teacher's negligence toward effective selection of teaching methods and material, poor classroom in term of facilities, unfavorable mathematical environment in class and that of school and so on.

Everybody should think creatively the above thoughts to develop the positive conception toward mathematics. If not, she/he will tend to increase the anxious feelings. Teachers play the major and highly responsible role to create frustration and anxiety about mathematics to the students. Students feel difficulty to study mathematics due to the cause of ineffective teaching.

If the teachers teach mathematics by clarifying the real concept, then the questions will not be raised about the difficulty in it. The mathematical concept should be proved experimentally through different perspectives to establish the permanent concept in its knowledge. But the teachers are not able to perform in this way. Most of

the teachers have no idea to teach it like a story, consequently students feel it as a dry subject without any interesting feelings and ultimately results anxiety in mathematical.

The main cause of minimizing the mathematical interest in students is that teachers are unable to teach it as an interesting story. Teachers need to devote their mind to motivate the students to establish the mathematical interest as well as strong concept. But teachers have no habit to promote students ability. Such conditions resulted the anxiety in mathematics. It is necessary to use the effective instructional materials for the formulation of mathematical concept but there are minimum conditions to use materials in most of the schools consequently, the situation tends to produce anxious feelings.

In the context of formulating the mathematical concept in learner's mind, first of all, the teachers needs to understand the conception. The teacher should be highly qualified and should be taught by relating with the local surroundings and need to provide so many examples. Materials should be managed according to the nature of subject matter and the students should be kept in classroom in appropriate ratio. But such favorable environment can be achieved in most of the schools then this results the negative attitude toward mathematical subjects.

Interview with Teachers

Interviews with teachers were conducted by the researcher in order to see the factors of anxiety in Mathematics learning and teaching. Researcher had met them for the interview on the related research. Researcher told them about research statement discussed about the possible causes about the anxiety in mathematics. Researcher used the developed interview guideline and took interview herself. Teachers were interested to express their experienced feelings in order to help the researcher and provided much

information based on the related sectors producing anxiety in mathematics. The themes developed based on the interview are given in the Episodes VIII to XI.

Ministry of Education (MOE) announced a report about school education. MOE has managed a system that out of 365 days of a year, 220 should open the school and minimum 180 days should run the teaching/learning program. But in average, only 79 days run the school with teaching and learning activities. Time punctuality was not maintained from the side of teacher because for example, some teachers enter into the classroom 10 min late and left before 5 min. The report showed that, in average, teacher were absent 10 days in a year and do not think about the coverage. The curriculum was managed for 180 days but need to finish in 79 days. This was the main cause of anxiety.

The level of anxiety in learning mathematics has been increasing due to the absence of specific targets of the Curriculum. Many students have not their own aim and future plan and have not the feelings about who am I? What is my aim? As a result they are unable to decide confidently. Student's negligence toward importance of time rather than using it was produced. Students do not consider the role for the success and failure. (Teacher A).

Some teacher always express the negative feelings in front of students, consequently, the students define everything in a negative way and are more anxious about mathematics learning. Some teachers do not check the homework, consequently, s/he does not know the modes of student's weakness. The discipline among the students was not maintained. Academic discipline should be maintained for success, consequently the anxious feelings will be reduced. Teachers have not devoted their attention to search the techniques to promote students self-confidence. Some teacher bits students frequently whatever the causes, which forces the negative feelings in subject matter and they think

about the possibility to control the student by punishment. Students do not want to practice and think that they do not understand math whatever the environment was created. Teachers do not use effective instructional materials that provide productive activities.

Less realistic approach to math in primary, lower secondary and secondary level some mathematical knowledge couldn't be accepted behaviorally, which creates frustration toward it. For example: 5 men need to build a house within 1000 hours, but how much time will be required to build this house for 1000 men? This problem will be the problem only in mathematics but we can't accept behaviorally. Every teacher should be capable to teach the subject matter effectively. But most of the teachers in school are untrained with low qualification. Parent's negligence plays the favorable role to reduce the children's self-confidence. Weak relationship between teachers and students destroyed the creativity, which must be realized (Teacher A).

This century known as the 21st century, the century of modernism, human being wants to be modernized from different angle. They are tending to higher education as fast as possible with proudly feeling. The problem they may be complicated or simple, students use scientific machine such as calculator as well as computer to solve them. Such condition plays the role to reduce the creativity existing in students. Consequently, the self-efficiency will be minimized.

Many students who are weak in study are interested to sit with weak students and it is difficult to create the learning environment. They copy the guide and talent's note copy for doing homework but do not devote time for thinking seriously. Ultimately they hate to study. They do not know about application and utility within and outside national

and international perspectives. School environment is directly related to the effective learning.

School environment need to maintain suitably according to the philosophy of learning, if not, the learning program will be technically paralyzed. Most of the schools are unable to maintain the effective learning opportunity. Teamwork spirit among the school family should be balanced nicely. Role of School Management Committee (SMC), principal, teachers, peon, and students should be demonstrated actively or performing any kind of tasks whatever the importance is there. The teamwork spirit motivates learning and teaching heartily, consequently, the academic program runs effectively. But most of the school is unable to create such environment as a result, we are observing such poor condition among students. Negative attitude of parents towards the daughter affect the study and tending to narrow minded. Parents have some duties to perform for school.

The role of parents is not only to send their children to the school but also to check reliable situation that their children are going to right way or not. But most of the students do to play the optimum role for the betterment. There are so many economical and sociological disasters, which are still standing opposite to the improvement. Most of the students in Nepal still lie below the poverty boarder line. They do not able to fulfill their basic needs and the capacity runs far from them. Such conditions destroys the family background, consequently, the poor children become servant for rich person. They do not get the opportunity to study. Such conditions play the vital role to minimize the educational achievement. Weak evaluation system played the negative role to maximize the anxiety in mathematics. In Nepal, the formative evaluation system is not still applied to improve the educational improvement. Dynamic evaluation should be

applied to access the student's performance continuously. But most of the school neglects such phenomena and focus to apply the summative form.

Negligence to time punctuality was found in most of the teacher in order to deal the course effectively which provided the minimum achievement in mathematics consequently the anxiety in mathematics. Most of the students haven't their future plan, so the study wasn't generated through spiritually. This is also the cause of anxiety in mathematics learning. Lack of mathematical language, its application and utility in daily life situation created the anxiety in mathematics. Most of the parents and students do not remember that home is the first school for the children. Factors concerning teachers, students and peer group play the leading role to promote the anxiety in mathematics. Students do not know him/herself who am I? and do not provide the sufficient attention for study. Family's economical, social and educational environment directly affects the study as well as mathematics performance. Students do not realize their self-confidence by him/her, consequently, he/she forget his/her own ability. School teamwork spirit, ability of teachers and student devotion acts the significant role to promote mathematical interest. If it fails to be maintained the anxiety in mathematics will be increased. Negative explanation about mathematics from the sides of teachers and other persons also created the frustration and anxiety in mathematics.

According to Teacher B, there are various causes responsible to reduce the self-efficiency in students. This situation creates anxiety in mathematics. The causes available by him were presented below:

Insufficient level of motivation in students to study Mathematics (Most of the teachers do not know about the techniques for motivations), insufficient of instructional materials on teaching/learning mathematics, inadequate opportunity for teachers to be

trained (also, the trained teachers are not conscious to apply the outcomes of training), less productive activities performed by school administration to motivate the students to study mathematics. Lack of activities performed by community and School Management Committee to promote the curiosity of teachers and students played the main role to promoted anxiety in mathematics learning. Since students are going ahead with the feelings proudly then they are unable to maintained the discipline, consequently they have lost the habit of doing homework and class work. They have lost the laborious behavior and devotion of time in doing exercise in order to establish the real and permanent concept about mathematical subject-matter. So this results the anxiety in mathematics. Students are not present in school regularly. Low achievement in mathematics in comparison to other subjects leaded to negligence to hard study. (Teacher B).

Most of the students in the classroom are shy to ask the questions about mathematical content/concept to the teacher. The thinking is not found about that mathematics is an attached knowledge in human life. Students and teachers were unable to perform the teaching/learning activities by keeping those facts in their mind. Students are upgraded to secondary level with weak base from primary level. They passed primary level and lower secondary level without understanding basic knowledge of mathematics. It is not necessary to pass math to upgrade the class. Some students never passed mathematics in exam but they are now studying secondary level.

There is a misconception that mathematics is difficult subject which is main obstacle to minimize self-efficiency in students. Most of the students are going to lose the moral behaviors and they neglect the respective behavior to mathematical knowledge and to the teacher. Also, some teachers are not able to maintain the balanced form in morality. The implementing system for upgrading the students should be based on the

necessary system to pass all the subjects but most of the community school also upgrades the students if they failed any two subjects. These conditions obviously minimize the self-efficiency and consequently promote anxiety in mathematics.

Students do not think that mathematics plays the vital role to develop the career. There is not co-operative behavior between students and teachers. Most of the teachers do not concentrate to apply the outcomes of training. Absence of students in classroom created frustration in mathematical interest and ultimately produced anxiety in mathematics. Teachers didn't provide the technique for motivations to mathematical subject matter. Low participation/ low practice results weak base consequently small number of students like it but large number of students does not (Teacher C).

Most of the students never do the homework and the teachers also never check it. The environment to share the experience is not maintained each other. Everybody thought that math is a difficult subject and not to use in human behavior. Students devoted their attention only to class teacher and mark-ledger instead of achievement. Lack of co-ordination between teachers (teaching staffs) and the discussion have been neglecting. Positional hierarchy plays the dominated role between school staffs.

Weak students choose unsuitable place to sit in classroom. Traditional teaching approach is applying still in most of the schools, which are unable to develop creativity in students. Teachers have no habit to establish the mathematical concept before solving exercise problem, so students are unable to speak about subject matter. Some mathematical contents are not relevant to the daily life situations. Contents have not managed with the philosophy of scope and sequence. The teachers didn't focus about the structure of mathematics. Students are not familiar with the structure. Most of the teachers do not know about the mathematical structure. This leads to maximize the

anxious feelings in students. Students give priority to economical and vocational aspects rather than learning.

Instructional materials are not used frequently based on the nature of mathematics and we have not got the chance to construct the materials from the side of school administration. The teacher didn't focus to the concrete concept, so it is difficult to establish the abstract concept. Consequently students didn't understand the structure of math. School always focused the summative form of evaluation rather than formative form. Teacher didn't apply formative assessment techniques to construct the strong educational background. Bad habit of copying guide and cheating behavior is going ahead in student. Consequently mathematical interest is tending to lower point. These above aspects are only the sample out of so many others. These weakness play the responsible role to maximize the quantity of anxiety in mathematics.

The main cause of student's anxiety is that they do not practice at home seriously. Most of the students are exam oriented rather than knowledge oriented. Student's harassment and negligence to creative study played the key role for anxiety in mathematics. The study of structure of mathematics didn't focus in most of the school and is the main cause of anxiety in mathematics learning. Lack of effective instructional materials and methods available in school promoted the loss of student's self - confidence.

Most of the parents are illiterate. They are extremely weak in math. They cannot measure the ability of their children. They have sent their children to study math on tuition coaching. This shows the supportive behavior but not creative role. Most of the students think free age and unable to use the time for mathematics study. Although teacher training program provides so many techniques, tools and force to teach through

student centered approach but the applying conditions could not be created due to the large number of students in class. Lack of sufficient time for a period, minimum school opening days (only 110 days run the school of 180 days) half holiday on Friday and most of the programs were conducted on school organized by different sectors such as parties, schools and so on. Such condition created the minimum running days of schools. This also created negative learning environment and consequently produced the anxiety in mathematics (Teacher B).

Although there is no negative relation between teachers and students and most of the students accept their own responsibility for mathematical weakness but they advocate self- weakness rather than improving it. Talent students followed talent and weak students followed to weak but the mixing co-ordination was not seen in each other. Weak student followed to talent for talking rather than studying. Most of them didn't touch the mathematical taste due to the weak performance of students as well as teachers. Most of the students do not provided the time for mathematics. To create such conditions so many causes are responsible such as cheating conditions on exam, upgrading system being failed in any two subjects, some have negative feelings to its study and so on.

Lack of co-ordinations between the content of school and college level, school administration is highly hopeful to students' mathematical performance but never measures the ability by formative evaluation techniques. Teaching materials are partially available in school but the using condition couldn't be created because of the weak environment (large number of student's managed materials, tight classroom etc.) particularly, in teacher's class, out of 150 students, the following level can be seen:

10%- Talent (Realize the sense of math), 15%- Talent (understand the problem)

10%- weak (low achiever) and 65%- Weak (Do not like mathematics period too).

Large number of students fails under the category of weak position. They make their weak surroundings and cannot manage the mathematical environment. This resulted anxiety in mathematics.

Interview with Students

Six students three from each school were interviewed with a view to find different perspectives in anxiety in Mathematics learning. Most of the students have good behavioral relation with teacher. Some have neutral relation. Some have extremely positive and no negative relation was found. Every student found the informal behavior of teacher in classroom. Teacher's joking style killed the seriousness to study mathematics nicely. Most of the students were accepted their own weakness in mathematics. Teacher never solved the complete problem. He just starts and left the class. No discussion has been conducted from teacher.

The sources of anxiety as perceived by students can be given in the responses of the individual student.

Susma's Views

I was not able to form the conceptual basis through the beginning of the school because of negligence of teacher. I left so many classes on different grades for watching the program conducting in the village. Lack of educated guardians in home i became weak in math. I usually followed weak friends which created the loss of creativity. I didn't provide the time for mathematics.

Sambridhi's view

Traditional causes and misconception about son and daughter pressured to perform the home task. Negligence to study math in lower class made me so weak. I have

no habit to do homework. Noisy classroom made me upset. Illiterate family didn't force me to study. I have no time to practice because I need to engage for home tasks. Due to hig density of students in class, I felt difficulty to write. Mathematical discussion and activities did not conduct. I didn't have to interest to learn mathematics because of its difficulty. Teacher did not check the homework continuously so we have forgotten habit of doing homework.

Rajen's Views

Lack of family motivation to study is responsible to make me weak in math. Most of the families are in below the poverty line. Students did not get chance to study at home. My attention diverted outside the classroom while learning is running ahead to observes the peers activities. I didn't realize the relevancy about mathematics content. Students negligence to teacher, teachers negligence to students as well as content was created weak performance. Lack of experimental study, material, homework done and punishment to bad students were created the ineffective environment. No practice, no study hard, absence of knowledge about the relevancy & application, unable to understand the structure of mathematical content made me so weak in math. Consequently, the anxiety in mathematics was maximized.

Sushant's Views

I have never done the homework and I missed the class. Noisy classroom diverted the concentration but the teacher was not able to control it. Recreation affected negatively because of the gang age. Minimum practice, shyness, weak memory power, weak relation between students and teacher made me so weak in math. Consequently, the anxiety was maximized. Misconception in math, lack of expert teacher and weak

responsibility in teaching staff and emphasizing in rote learning made every student weak in mathematics.

Ritesh's view:

I have no time for participate At home because of unfavorable situations. Poor economic condition and irregularity in collage made me weak. I couldn't concentrate my mind in classroom. If a student left a class, other followed him/her whatever the causes arises. Students were failed to maintain the nice environment in class. This holds for the teacher too. Talking in classroom made noisy environment, so we never understand the problem and we have no interest in mathematics. Teacher didn't solve sample problem similar for so many others. Lack of materials, rotted formula and no punishment for undisciplined students destroyed the creative environment. I was not interested to those problems which were unable to do. I did not think about the importance of math. I also followed the cheating to pass the exam. Most of the students were not interested to study to pass Board exam and optimistic for home center.

Aditya's View:

Interaction between students and teacher on math content has never been discussed. Student and teacher didn't active in order to conduct the interactive program productively. Lack of future plan and employment problem made everybody weak in math. Load-shedding affected negatively. Teacher bit the students being homework done. Mathematics is a difficult subject. No effort to practice, passive form of teachers as well as students, no habit of doing homework if problem became wrong, out of track attention, noise classroom, lack of understanding the structure of mathematics made to create anxiety in math. Teacher followed to talents rather than weak. Loss of curiosity to

study math, being failed in math and absence of supervision conducted were the main causes to produce the anxious feeling towards mathematics.

Students' own self responsible to make weak base in mathematics. Teachers have not tried to teach effectively to establish the mathematical concept. Weak family background in terms of education, economic, social conditions made everybody weak in math. Recreation program was affected badly being gang age because of negligence to study. Suitable environment in school as well as in home did not balance to study nicely. Weak relation among teachers, students and parents and no discussion among them destroyed the learning environment. We got the base in math and loose the self-efficiency. Consequently the anxiety in mathematics was maximized.

Role of Anxiety to reduce Mathematics Achievement

There is challenge in teachers' sensitivity in helping students learning as a result students felt anxious in mathematics.

Teachers are to be sensitive to individual students who seem unhelpfully anxious; set targets for reducing this anxiety through encouragement, reassurance and by sympathetically avoiding putting such pupils under unnecessary pressure; for example, do not expect them to answer questions or demonstrate mathematical procedures in public.

Most of the teachers do not share their experience on their students which can help to reduce the anxiety. In planning tasks for pupils, ensure an appropriate balance between challenge and success. Pupils respond to challenge, but too little success and the repeated experience of failure is likely to foster low self-esteem and anxiety.

Teachers need to make sure that the provision of correct answers is not the only thing for which pupils get rewarded in mathematics lessons. Give marks, encouragement,

praise and so on, for having good ideas, for thinking creatively, for having a go, for taking risks, and for process.

Teachers need to recognize that some pupils need more thinking time than others, so do not put too much emphasis on doing mathematics quickly or expecting children to provide answers to questions instantly.

Teachers need to make mathematics enjoyable for pupils, so they want to participate and are less likely to be inhibited. They need to communicate positive attitudes to mathematics and teach the subject with enthusiasm, a sense of humour and fun, showing pupils that you enjoy it and value it.

Teachers need to develop a classroom ethos in which pupils know that the teacher welcomes their questions and wants to know if they do not understand. When giving pupils any kind of assessment task, emphasize that the main purpose is to help you find out how well you have been teaching them and to teach them better in the future.

Chapter V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

Summary of the Study

The title of the study is “Causes of anxiety in mathematics learning.” The main objectives were to find out the causes of anxiety in mathematics and to suggest the remedial measures. The present study was done with a view to answer the question how anxiety is caused in learning mathematics is the main problem to have low achievement and performance in Mathematics in Nepal. The main objectives of this study were to find out the causes of anxiety in mathematics and to suggest the remedial measures. This study was done in two schools of Kathmandu valley. Mathematics teachers and students studying mathematics in higher secondary level within Kathmandu Valley can be the population of the study. Two mathematics teachers, eight students of two higher secondary schools were selected as research participants. This is a case study about the causes of anxiety and remedial measure to reduce anxiety, so qualitative approach of research methodology was used. Mathematics teachers and students were interviewed. Collected data, analyzed part and interpretation between them were resulted different findings. The findings were listed according to the theoretical and conceptual framework.

Findings of the Study

The findings of the research are as follows:

The research showed that there is a large intersecting part among the information/views given by students, teachers and observation.

i) Most of the students lost the habit of doing homework increasingly. Negligence to homework doing implies low practice, low practice implies loss of self-efficiency, and loss of self-efficiency implies the maximization of anxiety in learning mathematics. Doing homework is directly proportional to practice in mathematics. Practice in mathematics is inversely proportional to anxiety in mathematics. But it was found that most of the students didn't practice the mathematical problems and is a main cause of anxiety in mathematics.

ii) It was found that lack of understanding the structure of subject-matter have resulted loss of self-efficiency to perform the mathematical task. For example: If $\sin 2A = 2\sin A.\cos A$ then $4\sin^2 A.\cos^2 A = ?$ But most of the weak students were unable to tell this fact currently.

iii) The structural understanding of mathematical subject-matter is directly proportional to the conceptual understanding, conceptual understanding is directly proportional to the students Self-efficiency and student's self-efficiency is inversely proportional to the anxiety in mathematics learning which is obviously in trigonometry learning.

iv) It was found that loss of discipline on students implies dominated behavior toward teacher. Undisciplined behavior implies no respective attitude. Negligence to teachers implies negligence to mathematical commands. Minimum attitude toward math implies loss of self-efficiency. Consequently the anxiety in mathematics was increased.

v) Good discipline creates the seriousness toward study and increases the creativity about the mathematical thinking. Such thinking is directly proportional to anxiety in mathematics.

vi) It was found that teacher's negligence to check homework affects directly for the negligence to do homework from the side of students.

vii) It was concluded that teacher's negligence to do homework is directly proportional to the negligence to do homework from students and finally the self-efficiency on students was decreased and the anxiety was increased.

viii) Teamwork spirit among teacher's was directly proportional to effective teaching and learning. Effective teaching/learning program is directly proportional to anxiety in mathematics. On the sample college, it was found that the effective teaching plays the favorable role to promote the anxiety in mathematics.

Strong teamwork spirit implies effective teaching and learning activities and is inversely proportional to the anxiety in mathematics.

i) Absence of creative thinking have resulted the anxiety in mathematics due to the paralyzed form of self-confidence.

ii) Absence of mathematical programs conducted by school was played the positive role to produce anxious feelings on students.

iii) High degree of cheating behavior found in students didn't force to creative thinking about mathematical subject-matter. Negative attitudes have forced to neglect mathematics study. the degree of cheating on the students of sample colleges was found maximum which is the main cause of anxiety in mathematics learning.

Cheating behavior is directly proportional to creative study, creative study is directly proportional to the self-efficiency within students and self-efficiency is inversely

proportional to the anxiety in mathematics learning. Cheating is the main factor found in the sample colleges to reduce self-efficiency. Consequently the anxiety in mathematics was increased.

iv) It was found that the polarization of students played the negative role for conceptual understanding. Grouping system was found in such a way that group of talent students had placed in section A and the group of weak students had placed on section B and C. such placement created the high distance between the level of talent and weak.

Polarization of students was created unreasonable distance between talents and weak. Group of talents hoped that they have strong mathematical concept if they have not and went downward with over confidence. Group of weak thought that they didn't understand the mathematics subject-matter.

v) Lack of effective instructional materials and appropriate teaching methods corresponding to the trigonometrically subject-matter are also responsible to create the anxiety in mathematics. The researcher didn't see the materials during the research on the sample colleges.

Selection of appropriate teaching strategies and effective materials is directly proportional to conceptual understanding. Conceptual understanding is directly proportional to structural understanding and structural understanding is inversely proportional to anxiety in mathematics. This is also the main cause to reduce self-efficiency and produce the anxiety in mathematics learning.

vi) Lack of expert teacher results poor teaching and learning activities which were found on sample colleges too. Teachers were unable to establish the

conceptual understanding. Consequently the students did not know about what they studied. This also promoted the anxiety in mathematics.

vii) It was found that there is no creative visualization about the mathematical subject-matter. Teachers were failed to establish the mathematical concept properly in the mind of students by applying different techniques such that the learners can think concretely what they learned.

viii) It was found that the college administration played the passive and irresponsible role during the research that created irresponsible role among the staffs. The teaching and learning activities was not run effectively and that promoted the anxiety in learning with anxiety in mathematics learning.

Conclusion

Since the study, is the study of anxiety in mathematics found in Higher secondary schools students. So, it was hoped that it is very useful to maximize the mathematical understanding. Being the large important of mathematics all over the world students does not like it through the heart. There are so many causes which were found after the research that are responsible to maximize the anxiety in mathematics. School staff, school management committee weak rules and regulation provided by government, peers, contents, curriculum, economical, and educational condition of family and so on are responsible for anxiety in mathematics in some (high and low) degree. It was suggested that to maintain the balance from in conceptual understanding of math among students in order to reduced anxiety in math, t is necessary to address efficiency to the finding mentioned above. The related sectors should realize their own weakness and devote the attention to update the mathematics learning in terms of the demand of time and level of students. After improving the weak behavior from the side of various

components, the mathematics surrounding will be created and everybody will know that the existing world is the mathematical world.

Recommendations

This study was based on the main theme to search the causes of anxiety in mathematics learning. On the basis of study's findings some recommendations have providing to reduce the anxiety in mathematics learning. Some recommendations are as follows.

- Students should be self-motivated to learn and teacher should provide some technique to establish the mathematical concept nicely and creatively.
- Teacher should focus to study the structure of mathematics. School administration should be able to maintain the balance form in student's discipline teamwork spirit among staff to educated teaching learning program effectively.
- Some of the key principle to motivation the students in classroom practices can be suggested as: Be sure students can fulfill their basic needs, make sure that the classroom is comfortable, orderly and pleasant, help students to perceive classroom task as valuable, be sure tasks are suitable for students capability, recognize that students have different level of anxieties and need for advancement, help students to make appropriate responsibility for their success and failure, help students to set responsible goals, provide varieties of learning activities, use novel and interactive instructional methods, use cooperative learning methods, use cooperative learning methods,

monitor student’s work and provide feedback, provide way for improvements.

REFERENCES

Ashcraft (2000). *Dictionary of mathematics*. Available in www.mathacademy.com/pr/minitext/anxiety/-61k

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175-1184.

Battista, P. (1999). *People will proudly admit to having mathematics anxiety*. Available in www.articlesforeducators.com/dir/mathematics/math_anxiety.asp-23k

Russell, B. (1903), *All Mathematics is a Symbolic logic*.

Cemen, S. (1987). *The nature of Mathematics Anxiety*. Stillwater: okhhoma State University.

Dulal, R. P. (2008). *Causes of anxiety in Mathematics learning* /Case Study. An unpublished Master Degree thesis submitted to Department of Mathematics Education, Central Department of Education, TU, Kirtipur, Kathmandu.

Ferry, T. R., Fouda, N. A, & Smith P. L(2000). The role Family Context in a Social Cognitive Model for correlated Choice Behavior: A math and science perspective. *Journal of Vocational Behaviour*, 348-364.

Fireman, Hayes &Wilson, (1998) Description of Mathematics anxiety

Fitzgerald, S.M (1997). The Relationship between Anxiety and Statistics Achievement: A Meta- Analysis. Unpublished Dissertation, University of Toledo, Toledo,

Oxford English Dictionary (1933), Definition of Arithmetic and Algebra

Pandit, R.P Foundation of mathematics Education

Pandit, R.P(1980), Neupane, (1985), Upadhya, (1985), Yadav (2000), Neupane, (2001 Ph.D), and Scarpelo (2005) Thesis abstract by Hari Prasad Upadhyay In Mathematics Education,T.U)

Richardson and woolfolk (1980) Abou anxiety, boston (1981), Ceemen (1987)

Upadhyay, H.P (2061). Teaching mathematics in Secondary School. Kathmandu: Ratna Pustak bhandar/ Foundation of mathematics Education

Websites:

www.google.com

www.wikipedia.org/wiki/Education

www.wikipedia.org/wiki/Trigonometry

APPENDIX A

Interview Guidelines

(Teacher)

Sample Questions

1) What do you know about anxiety?
2) Are there any students anxious in learning mathematics from your class?
3) Why do s/he is anxious?
4) How is s/he showing anxiety in learning mathematics?
5) Can you describe some evidences for claiming that s/he is anxious?
6) Can you add other evidences?
7) What can be done to address anxiety by him or her?
8) What can be done to address anxiety by teacher?
9) What can be done to address anxiety by school administration?
10) What can be done to address anxiety by her friends?

APPENDIX B

Interview Guidelines

(Students)

Sample Questions

1) What do you know about anxiety?
2) Are you anxious? When and why?
3) What do you do when you are anxious?
4) Can you describe some evidences for claiming that you are anxious?
5) Can you add other evidences?
6) What can be done to address anxiety by you?
7) What can be done to address anxiety by your teacher?
8) What can be done to address anxiety by school administration?
9) What can be done to address anxiety by your friends?