

**STUDENTS' ATTITUDE TOWARDS ON ADDITIONAL MATHEMATICS AT
CLASS X**

A

THESIS

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Letter of Certificate

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(Prof. Dr. Bed Raj. Acharya)

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Date:- 15th March 2021

Letter of Approval

Letter of Approval This is thesis entitled “**Students’ Attitude Towards on Additional Mathematics at Class X**” submitted by **Mr. Mohanilal Basyal** in partial fulfillment of the requirements for the Master's Degree in Education has been approved.

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This is to certify that **Mr. Mohanilal Basyal** has completed his M. Ed. thesis entitled “**Students’ Attitude Towards on Additional Mathematics at Class X**” under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, and Kathmandu, Nepal. I recommend and forward his thesis to the Department of Mathematics Education to organize final viva-voce.

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Declaration

This thesis contains no material, which has been accepted for the award of other degree in any institutions. To the best of knowledge and belief this thesis contains no material previously published by any authors except due acknowledgement has been made.

.....

(Mohanilal Basyal)

March 2021

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.....

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Abstract

This study focused on Students Attitude towards on Additional Mathematics at Class X of Kathmandu district. This study is based on mixed method under concurrent design. Survey was conducted for quantitative data and interview with students' and teachers' for qualitative data. The purpose of this study was to find the students' attitude towards mathematics and the factors affecting students' attitude towards mathematics at grade X. Researcher selected 230 students from 12 community based schools by simple random sampling method (odd-even method) and the schools were selected by systematic sampling method. The data were collected from questionnaire and unstructured interview schedule.

For the quantitative data 40 statements of questionnaire were used in this study. The collected data were organized, tabulated, analyzed and interpreted by using the statistical package for social sciences (SPSS) program. Percentage and χ^2 -test were used to find out the attitude of students towards mathematics at 0.05 level of significance. The responses from interview were recorded and transcribed under the headings and then were organized in themes and categories that emerged. The result of this study showed that most of the students had positive attitude towards mathematics at grade X but many of the students have facing so many problems such as, lack of students' confidence level, mathematical anxiety, lack of guardians' qualification, home environment, social culture, social tradition, social discrimination, lack of trained teacher, lack of teaching material, and due to other physical facility are the main factors that affecting students' attitude towards on additional mathematics.

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Chapter I

INTRODUCTION

Introduction of the Study

Attitude towards mathematics is one's view, opinion towards mathematics. According to Zanand Martino (2008), an attitude is fundamental concern on learning of mathematics. An attitude can be as positive or negative evaluation of people, objects, events, ideas and activities. It could be concrete, abstract or just about anything in our environment. Attitude can be seen as more or less positive. A positive attitude towards mathematics is reflects a positive emotional disposition in relation to the subject and in similar way negative attitude is towards mathematics relates to a negative emotional disposition.

Attitude towards mathematics is defined as a general emotional disposition towards the school mathematics. This should not be confused with attitude towards the field of mathematics or towards some specific area within mathematics. An attitude development may be influence by a number of factors operating in sides or outside school, by the teacher and bye-learning environment.

Haan (1961), argues that "the attitude of students and teachers understanding of mathematics as the large number of teacher who desired or fear mathematics has become a factor in children attitude towards the subject". In the 21st century mathematics is an essential subject for various field of science and technology, economics, management, business, and many other fields. Most of the guardians want their children study mathematics and science well. They inspire even compel their children to study these subjects. But most of them do not know about various psychological factors, for

examples their children's interest, aptitude, attitude, ability and intelligence towards those subjects.

They are not even capable to find out whether their children have got a favorable (positive or negative) attitude for the study of particular subject or not. As a result, there is large number of students failed in mathematics examination and increase dropout and repeated rate. Mathematics has a great role in human life; our daily life and all civilization cannot be imagined without mathematics. It is used in every activity of our society. It is needed for the study of most of the discipline. It is the foundation of all the sciences. Now a day, mathematics is considered as an important subject called the queen of all sciences, key and gateway of all sciences.

It is directly related to the cultural, political, social, geographical condition of society. Mathematics is the way of thinking, organizing, analyzing and synthesizing the body of data. Mathematics develops the ability to think logically and creatively for the proper development. A strong backgrounds in mathematics necessary almost all technical careers in society. Mathematics has not only been useful in its own right. But it has also enriched this world by helping in development of other field of knowledge.

There is no science, no art and no profession where mathematics does not hold as a key position. Mathematics has grown with the development of early civilization and present modern civilization. Due to the change of needs and demand of society the aim of education also changes consequently, mathematics in the 21st century put great emphasis in today's society to meet the rapidly growing need and demands. So mathematics has been given a significant place at all levels of school curriculum. Every student should study it and gain better achievement in school mathematics.

Numerous researches have been carrying out to identify the variables that influence the attitude towards mathematics. The study of mathematics is not only essential for practical life but also for as inspirable parts in the science and technology. There are two important aspects on mathematics program that are, mathematical aspects and social aspects. The first aspect is related to usefulness of mathematics in daily living and the balanced optional mathematical curriculum is combination of both aspects. The aim of mathematics in grade X is to develop positive attitude, to apply mathematics in daily life, to develop mathematical knowledge for the further study, to appreciate as a means of communication. To execute the challenging aim of mathematics should be sincere, honestly and co-operative attitude from the side of teacher co-operation in teaching learning activities.

The area of mathematics is not bounded but has been adding several new concepts with the evaluation of human society. Now it is being the composition of different branches of mathematical concepts. So, it is most essential to invent about its many disciplines and develop it ahead according to necessary of solving many problems faced by students in present situation.

Many of the schools have got zero achievement in SLC examination every year due to mathematics. In 2074 B.S. there are 25 students attended in the SEE examination from Good Start Academy Secondary School at Gongapu, Kathmandu, out of them only 14 students were passed and 11 students were failed in mathematics only.

In 2074 B.S., there are 23 students involved in SEE examination from Peace Land Secondary Boarding School at Manamaiju, Kathmandu, out of them only 10 students had passed in SEE examination and 13 students were failed in mathematics. Although those

students who had passed in had got least marks around 40. Similarly, in 2075 SEE examination from Good Start Academy Secondary School, only 2 students got C+ grade, only 5 students had got D+ grade and no one got grade B and above.

So this issue forced to researcher for this study. Hence the mathematics which always fastens its speed for further development. So in this study stress has been laid on investigating the attitudes of grade students of Kathmandu district towards mathematics.

Problem Statement

The problem of this study mainly concern with the attitude of Class X students towards on Additional Mathematics. Also the researcher wants to know the influencing factors that affects the attitude of Class X student towards mathematics and also analyzed the attitude of students towards mathematics at Class X. Thus the study attempts to seek the answer of the following questions;

1. What are the students' attitudes towards on Additional mathematics at Class X?
2. How can we improve the student attitude towards on Additional mathematics at Class X?

Objective of the Study

The main objectives of this study as following:

1. To find the students' attitude towards on additional mathematics at Class X.
2. To analyze the factors affecting students' attitude towards on additional mathematics at Class X.

Significance of the Study

Mathematics is very useful and valuable subject for everyone. It should be helpful in every person's daily life. That's why everyone should study mathematics and gain good achievement. For the good achievement there should be positive attitude from every aspect towards mathematics. To gain the mathematical knowledge everyone should study in-depth. So the mathematics becomes one of the essential parts of school curriculum. Together with compulsory mathematics, optional mathematics also play vital role in everyone's life. It is more practical and behavioral than compulsory mathematics. Mainly it should be helpful in studying higher level for several related fields. Thus this study has following significance;

- This study helps to those students who have fear to study on Additional mathematics.
- This study is helpful for those students who want to study science and technology as well as mathematics in higher level.
- The result of this study is helpful for national policy maker, mathematics curriculum designer, researcher person educational administrator, educationist and guardians of students of secondary level students.
- This study is helpful for rural areas students who don't give opportunity to study on Additional mathematics.
- This study helps to make positive attitude of secondary level students towards Additional mathematics.

- This study also provides information about why most of the students were failed in mathematics at public schools.

Delimitation of the Study

Some of the terms used in this proposal are defined below

- This study was conducted in twelve secondary schools only.
- This study was limited in community-based secondary school in Kathmandu district.
- This study was limited in grade X students only.

Chapter II

REVIEW OF RELATED LITERATURES

Literature review is the most important component in research practice in which the previous researches are reviewed and researcher tries to differentiate the distance and similarities of their research. Reviewing related literature help researchers to limit their research question and to clarify and define the researchers in a better position to interpret the significance of their own results. Through studying related research, researchers learn which methodology has proven useful and which seem less promising. In the literature review there are two types of related literature reviews they are empirical review and theoretical review.

Empirical Review

Pandit (2007), studied on the topic “Attitude of secondary level students towards optional mathematics curriculum”. The objectives of this study were to find the attitude of secondary level students towards optional mathematics curriculum, to compare the attitudes of boys and girls towards optional mathematics curriculum at secondary level and to compare the attitude of urban and rural students towards optional mathematics curriculum at secondary level.

The design of this study was survey. The population of this study was all the students of Parsa district who studied optional mathematics. For this study researcher had selected 10 community base schools from Parsa district by using purposive sampling where five schools were from rural area and five from urban area. To collect the data researcher had used questionnaire and Likert five-point scale was used for scoring each item. Chi-square test was used to analyze the secondary level students’ attitude towards

optional mathematics curriculum. Also t-test was used to compare the attitude of boys and girls and to compare the urban and rural areas students' attitude towards optional mathematics curriculum at 0.05 level of significance.

The conclusion of this study was, there was a positive attitude of secondary level students towards optional mathematics curriculum, there was no gender wise difference in students had positive attitude than rural area students towards optional mathematics. Also find boys had better attitude than girls towards optional mathematics curriculum according to attitude score obtained by boys and girls.

Bohara (2009), studied on attitude of students and teachers towards higher secondary school mathematics". The main objectives of this study were to identify the students and teachers' attitude towards higher secondary school mathematics in Kathmandu district and to find out how much students and teacher enjoy of the value of mathematics.

Survey design was conducted for this study. Researcher had administrated the questionnaire and observation form on 60 students from 20 schools and 20 mathematics teachers of higher secondary school. The researcher also used the Likert five-point scale for scoring each item in questionnaire.

To analyze the data mean, standard deviation and t-test was used to compare the attitude of students and teachers' attitude towards mathematics at higher secondary school mathematics at 0.05 level of significance. At the end of this study researcher had found that the attitude of students was slightly higher than attitude of teachers towards the mathematics. Also researcher had found that there is no significance difference between the attitudes of students and teacher towards higher secondary school mathematics.

Moreover, this study has shown that the attitude of students and teachers towards the higher secondary mathematics was positive.

Mallick (2009), studied on the topic “Attitude of secondary level students and teacher towards set theory. The objectives of this study were to find the attitude of secondary level mathematics teachers towards set theory, to find the attitude of secondary level students towards set theory, to compare the attitude of secondary level students and teacher towards set theory and to compare the attitude of boys and girls towards set theory. The design of this study was survey. The researcher had selected the 200 students and 25 teachers as sample from 20 secondary schools at Kathmandu district.

The Questionnaire was administrated as data collection tool. The researcher had consisted 32 statements for teachers and 30 statements for students. Chai-square was used to analyze the data collected during the study and t-test was used to compare the opinion of boys’ and girls’ students and to compare the attitude of teacher and students. Both the test was applied at 0.05 level of significance.

The conclusion of this study was there was positive attitude of secondary level students and teachers towards set theory, there was no gender wise difference attitude among students towards set theory and also found teacher had significantly better attitude than students towards set theory.

Mahato (2010), conducted the research on the topic “A study on attitude of abroad and non-abroad parents’ towards school mathematics. The aim of this study was overview the attitude of abroad and non-abroad parents towards school mathematics and to compare the achievement of their children in mathematics. The survey was conducted.

Researcher selected 12 sample schools and 10 parents were selected from each school in Siraha district. 60 were abroad parents and 60 were non-abroad parents.

The weighted mean was used to find out opinion of parents and t-test was used to compare the opinion of abroad and non-abroad parents and achievement of their children. He interpreted and analyzed the data by using weighted mean. Researcher found the result of study that there was positive attitude of abroad and non-abroad parents' towards school mathematics and the mean score of achievement of non-abroad parents' children were better than the mean score of abroad parents' children. Langat (2011), studied on the topic "Students attitude and their effect on learning and achievement in mathematics". The purpose of this study was to determine the effects of the students' attitude towards learning and achievement in mathematics education. This study adopted a descriptive survey design.

The study involved in seven sampled public secondary schools out of 23 secondary schools in Kiambu county and 140 students were selected for the sample from the target population were the form four students who were about to sit for their Kenya Certificate Secondary Examinations. The purposive and random samplings were employed in selecting the schools and the students from these schools respectively with the use of students' questionnaires as a method of data collection.

The response of students was analyzed by qualitative and quantitative approach. The study found out that most students had a positive attitude towards mathematics and also show that perceptions and beliefs, perceived learning abilities and competencies and previous performance of students in mathematics affected their level of motivation learning to low outcomes.

Waheed, (2011), studied on the topic “Secondary level students’ attitude towards mathematics in a selected school of Maldives” the purpose of this study is to find out the students’ attitude towards mathematics and find out gender difference in attitude towards mathematics in selected school of Maldives. A survey was conducted to find this result. For the survey, total of 200 students were chosen from grade 10. For finding the students attitudes he prepared questionnaire and administrated it with them. The students answered questions regarding their personal confidence to mathematics and perceived usefulness of mathematics. He had used the Fennema and Sherman attitude scale to find the students attitude. To find significance difference between gender and attitude towards mathematics t-test was conducted. The result shows that the attitude students towards mathematics are positive and there is no gender difference in their attitude.

Pant (2014), studied on the topic “Attitude of students towards optional mathematics”. The main objectives of this study were the attitude of secondary level students towards optional mathematics as well as their attitude with respect to gender and to identify the influencing factors of the secondary level students’ attitude towards mathematics. For this propose, researcher used survey method and selected 20 secondary schools as sample out of 110 secondary schools in Dhading district, where 10 schools from rural area and 10 from urban area. From these schools’ researcher selected 12 students from each school by random sampling. Among 240 students, 140 were boys’ student and 100 were girls’ student.

Fenneman-Sherman attitude scale was used for testing students’ attitude and researcher used questionnaire as tools for data collection. The data were analyzed by using descriptive as well as inferential statistics. The Chai square value and mean value

were used to determine the secondary level students and t-test was used to compare the attitudes of boys' and girls' attitude. The result was found that there was a positive attitude of secondary level students (both boys' and girls') towards optional mathematics and concluded that there was no significant difference between attitude of boys and girls towards optional mathematics. Also researcher found that the influencing factors were personal factors, school environment, parental environment, economic factors, tuition culture etc.

Alam (2016), did research on the topic, "Bangladeshi rural secondary school children attitude towards mathematics" with the purpose of this study was to check the reliability of using Bangla translated version of Fennema-Sherman mathematics attitude scale in the rural Bangladeshi context and analyze the preliminary data to observe the pattern of difference in attitudes to mathematics among different group. The purposive sampling method was used and chosen three secondary schools in rural area from where total of 161 students were chosen for survey. All the students were age group of 15-16 years. Some of them were studying higher math optional course but some were not. Fennema-Sherman mathematics attitude scale was used to find students attitude towards mathematics.

To analyze the data SPSS was used. The researcher found that the use of Bangla translated version of Fennema-Sherman attitude scale is reliable in rural Bangladesh although a few subscales have alpha reliability coefficient less than 0.70. From the preliminary data it is found that there is now significant difference in attitude towards mathematics between different group (Boys and Girls).

Timalsina (2016), studied on the topic, “Achievement and attitude of Tamang students towards mathematics at secondary level”. The objectives of this study were to find the attitude of Tamang students towards mathematics at secondary level, to compare attitude and achievement of Tamang students in mathematics at secondary level and to determine the relationship between attitude and achievement of Tamang students towards mathematics. For this study researcher used quantitative and descriptive survey design. Researcher had selected nine schools from Lalitpur district by using stratified random sampling method. On this study researcher had taken the sample school from the three-election region of Lalitpur district.

Researcher had selected 252 students by using simple random sampling method for sample. Researcher used questionnaire, which is prepared on the basis of George Levie (1971) for data collection. Researcher used Likert five-point scale to find attitude of students. Also t-test was used to compare attitude and achievement of the Tamang students in mathematics at secondary level and also used mean and standard deviation was used for data analysis.

At the end of this study researcher had found Tamang students had positive attitude towards mathematics at secondary level. There is no significance difference between Tamang students’ attitude and achievement towards mathematics. Also researcher found that there is high relationship between Tamang students’ attitude and achievement towards mathematics at secondary level.

Theoretical Review

In this review some ones’ theory or findings after research related to the topics are included. In this part researcher has include Eagly and Chaiken (1993) multi component

model of attitude. According to this model attitude are influenced by three components. They are Cognitive (belief, thoughts, attributes), Affective (feelings, emotions) and Behavioral information (past, events, experience).

The psychology of attitudes is generally a social psychology of attitudes. Clearly, cognitive psychology has contributed to our understanding of the micro processes involved in attitude formation and change, and biological psychology can account for the sensorial mechanisms underlying preferences for certain objects, such as foods. There is, however, a reason why attitudes have been a focus in social psychology: Attitudes are often learned from others, make individuals similar to members of their groups, and are affected by social pressure and persuasion – the act of attempting to change the attitudes of another person. In this introductory chapter, we discuss these critical issues regarding the nature of attitudes, addressing *The Psychology of Attitudes and Persuasion* 3 classic and contemporary questions. In doing so, we give you an insight into what the forthcoming chapters of the handbook will cover in more extensive detail, and thus, provide a brief sketch of the general organization of this handbook.

(G. Maio et al, 2010). When reviewing the related literature on students' attitude towards mathematics, it reveals that several factors play vital role in influencing student's attitude. These factors can be categorized into three distinctive groups. Firstly, factors associated with the students themselves. Some these factors include student's mathematical achievement score (Kogce et al, 2009), anxiety towards mathematics, student's self-efficacy and self-concept, extrinsic motivation (Tahar et al, 2010). And experience at high school (Klein 2004; Bosis & Cusworth, 1994).

The anxiety and fear may elicit negative attitude towards the subject among students and these general unfavorable perception and attitudes about mathematics are passed on to children from adults. Society that treats and views mathematics as an unknown territory made up of x's and y's society also views mathematics as teacher as sarcastic and important didactic and scornful (Mac nab and Cummine 1986).

Students unconsciously pick these views and they come to mathematics classroom with an already distorted perception and attitude towards learning of mathematics Secondly, the factors that are associated with school, teacher and teaching.

Some of these factors that influences attitude are teaching materials, used by teacher, teachers, classroom management, teachers' content knowledge and personality, teaching topic with real life enriched examples, other students opinion about mathematics courses (Yilmaz, Altun & Olkun, 2010 teaching methods reinforcement (Papanastasiou, 2000), receiving private tuition (Kogce et al, 2009), teachers' belief towards mathematics (Cater & Norwood, 1997) and teachers attitude towards mathematics (Ford, 1994, Karp, 1991).developed negative attitude towards mathematics.

In any given year of learning a student spends more time in school than at home. Much influence on a students' learning could in school given this much time spend therein. While at school he/she goes through a planned school program. He/she is subject to curriculum of mathematics, which is administrated in a classroom.

Eshiwani (1984) emphasized the need to have adequate resources in school to ensure students effectively learn mathematics. These resources include adequate an appropriate 3-dimensional models, geo-boards and textbooks among others. Access to these learning resources will determine how students learn mathematics. National schools

are well equipped but district schools lack basic resources (Twoli, 1986). If the school administration has not provided sufficient resources, learners, especially girls are likely to resent mathematics as being too involving and too much competitive.

Russel (1983), also found out that boys prefer manipulative teaching models. Hence mixed classroom boys lord over them while girls, lose out in the use of these apparatus and materials. Use of textbook with sexist orientation has not helped things either (Costello 1991). Textbook written by some authors have examples of boys doing very well. Frequent use of boys' name in the end of topic exercises make girls to feel that they are passengers in mathematics learning while boys can rumble and mumble and yet the teacher still wait for him to finish (Twoli, 1986).

Thirdly, factors from the home environment and society also affect students' attitude towards mathematics. Factors such as educational background of parents, occupation of parents' (Kogce et al, 2009) and parental expectations, social belief, social tradition, social culture (Tobias, 1993) plays a crucial role in influencing student's attitude towards applied mathematics. By the time of students joins from one, he/she will have interacted with his/her parent, who to a great extent, influence his/her perception of learning in school in general and specifically learning mathematics.

Orten (1994), attributed the noticeable difference in learning among boys and girls to "society attitudes and expectation". He asserted that influences of society and from the environment affect mathematical development of the students. Boys are engaged in more vigorous activities while girls take more passive roles. This scenario is replayed in school and in class while learning. On the other hand, difference in parental

expectations and desires and pressure they exert at home on their sons and daughters has been attributed for attainment variations among the sexes (Orten 1994).

Society views mathematics as a male subject as Costello (1991) found out. This especially when parents react and reinforce daughters and sons differently. When their children do something mathematically daughter are told “you really tried” meaning nothing much is expected from the female child. But to their sons, they are told, “you can do far much better” (Costello 1991).

Conceptual Framework

A conceptual framework provides a guidance of the study on the basis of theoretical review. Theory and conceptual framework are interrelated. The main propose of this study were to find the secondary level students attitude towards mathematics and to find the factors affecting students’ attitude towards mathematics at grade X.

In the above theory (Tehar et al, 2010) emphasis on the factors, anxiety towards mathematics, students’ self-efficacy and self-concept, extrinsic motivation. In their views, (Klain 2004) (Bosis & Cusworth, 1994) also added the factors experience at high school also influences the students’ attitude towards mathematics. Similarly, (Yilmaz, Altun & Olkum, 2010) emphasis that attitudes are influenced by teaching materials used by teacher, teachers’ classroom management, teachers content knowledge, teachers’ personality, teaching technique etc. and (Kogce at al, 2009) emphasis in the factors as educational background of parents, occupation of parents and (Tobias, 1993) added in these factors as parental expectation, social belief, social tradition, social culture etc. On the basis of this literature, researcher draws a following framework.

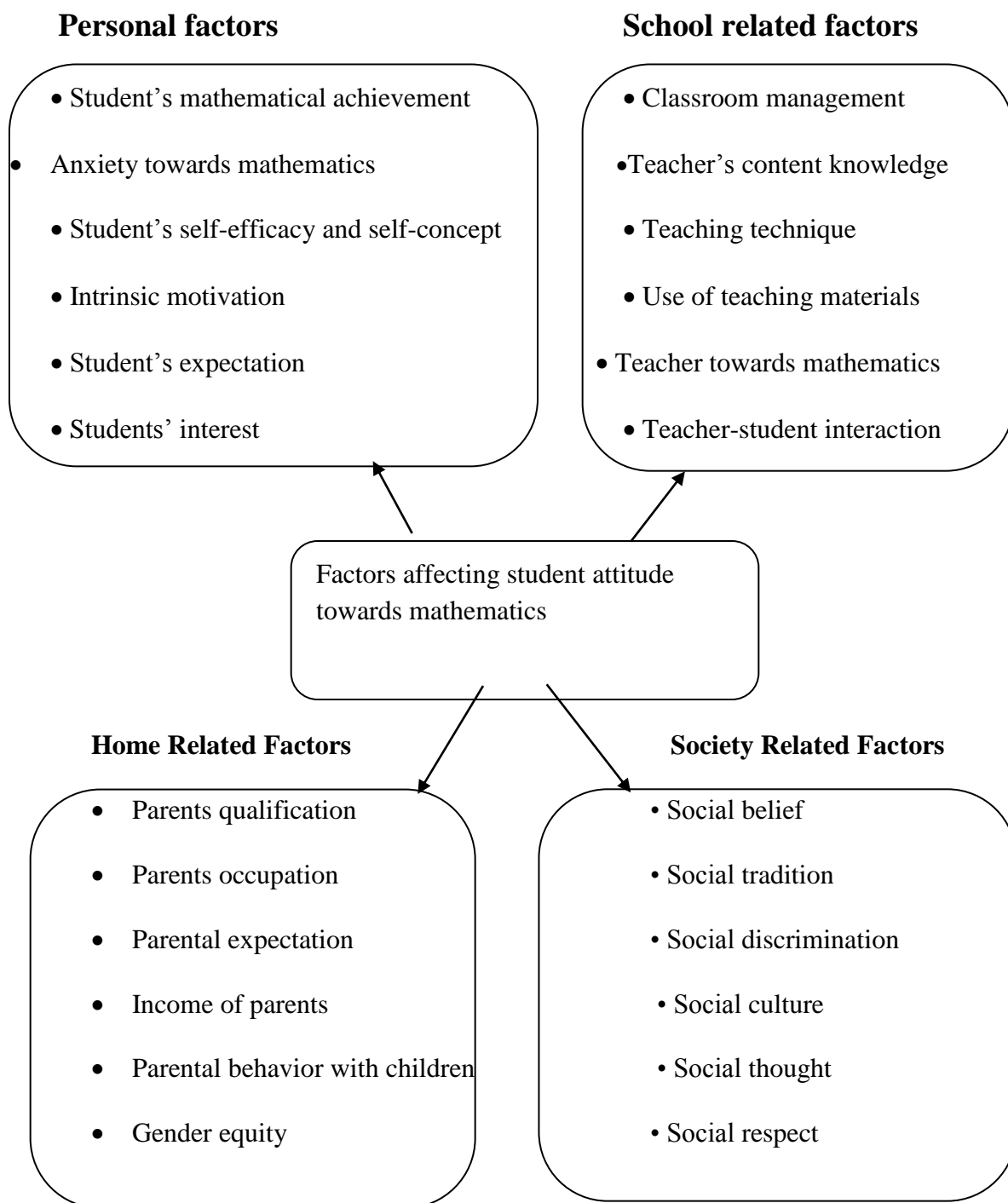
The above framework was constructed on the basis of the above-mentioned theory. From the above theory it is found that there is some factors associate with Factors affecting student attitude towards mathematics personal factors, school related factors, home-related factors and social factors. On the theory home related factors and social factors are described as a one factor but researcher described them separately on the basis of his experience.

Also researcher added some factors according to his experience under these factors. Under the personal factors theory includes students' mathematical achievement score, anxiety towards mathematics, students' self-efficacy and self-concept, intrinsic motivation and experience at high school. The second factors in the theory are school related factors. This factor includes classroom management, teacher's content knowledge and personality, teaching technique, use of teaching materials in mathematics classroom, teacher thought towards mathematics and teacher-student interaction.

The third factor in the framework is home-related factor. In this factor researcher added some factors according to his experience. These factors are parent qualification, parent occupation, parental expectation, income of parents, parental behavior with children and gender equity at home. The last factor mentioned in the theory is social factor. Under this factor researcher added six factors as social belief, social tradition, social discrimination, social culture, social thought and social respect to students. These factors play a crucial role in affecting student's attitude towards mathematics. Researcher had prepared 40 statements on the basis of these factors to investigate respondent attitude towards mathematics, which were used for quantitative data, and 20 statements were

prepared to investigate how these factors affecting students' attitude towards mathematics, which were used for qualitative data.

Table of factors affecting students' attitude towards mathematics



CHAPTER III

METHOD AND PROCEDURES

This chapter shows the design of plan and procedure of the study. It determines the size of sample, method of sampling process, methods of techniques of data collection, instrument of data collection scoring procedure and procedure of data analysis.

Design and Method of the Study

The research aims to find out the attitude of secondary level students towards on Additional mathematics and to analyze the factors affecting students' attitude towards on Additional mathematics.

For this study researcher had used mixed method under the concurrent design. Concurrent design is used when quantitative and qualitative data have to collect at a time. Also this design is useful when the result obtained from quantitative and qualitative data is to triangulate. Triangulation means description of data obtained from quantitative and qualitative data at a time. In this method first researcher should collect the quantitative and qualitative data one after another and then analyze the data obtained by both methods one after another and finally draw a conclusion obtained from both data. The quantitative method was used to find student's attitude towards on Additional mathematics and qualitative method was used to analyze the factors affecting students' attitude towards on Additional mathematics.

Population of the Study

The population of this study I take secondary level students of whole community based secondary schools of all students of class X of Kathmandu district. There are 115

secondary schools in Kathmandu district. Among them 4 are private schools and remaining 111 are community based schools. For the sample of this study researcher had chosen only community-based schools because the problem was shown in the community based schools. Out of 111 communities based secondary schools,

Sample of the Study

There are 12 - community base secondary schools were selected for sample by systematic random sampling method. Systematic random sampling method is a type of probability sampling technique. With the systematic random sample, there is an equal chance of selecting each unit from within the population when creating the sample.

This method is quite popular and widely used if complete list of population is available. From all 12 schools total of 230 students were selected for sample by odd-even method. For the qualitative data 5 students and one mathematics teacher were selected for sample in each school. So total of 60 students and 12-mathematics teacher were selected as a sample for qualitative data.

Tools of the Data Collection

To conduct the survey, researcher had prepared a set of questionnaire on the basis of conceptual framework and administrated on students at sample schools. Also taken unstructured interview with students and teachers. For interview researcher set twenty open-ended questions. For scoring each item of questionnaire, the Likert five-point scale strongly agree, agree, neutral, disagree and strongly disagree was used.

Reliability of Tools

Reliability concerns to degree to which a measuring instrument gives similar results over a number of repeated trials. Here in this survey to ensure the reliability of questionnaire researcher had conducted the pilot study on 20 students who were not involved in survey. The obtained data were calculated by using SPSS software setting at 0.05. The Cronbach α was found 0.78 (>0.60) which is the high score for reliability of each statement.

Validity of Tools

For the validation of the instruments, the researcher consulted with the thesis supervisor. The research tools used in this study were questionnaire for quantitative data and interview guideline for qualitative data. It also prepared by through the consultation with the expert. The statement was being fixed for the final study. For the interview, the researcher consulted with the thesis supervisor.

Data Collection Procedure

Data is the foundation of any research. Therefore, collection of reliable data is very essential part of all types of research. The researcher visited the sample school to collect data by questionnaire for mathematics students at secondary level.

The researcher took permission of head teacher and mathematics teacher before the distribute questionnaire for students. By the used of questionnaire the researcher took the attitude of all the students of grade X during their regular mathematics period in the presence of their mathematics teachers. For the response of students, the researcher distributed questionnaire to the students. After getting response of all the students, the

questionnaire was taken back with thanks. Then collected data was tabulated. Each statement was followed through each aspect by the rank responses in five point Likert-scales. Each positive statement received the score based on the basis of five point for strongly agree, four point for agree three point for neutral, two point for disagree and one point for strongly disagree, for negative statements one point for strongly agree, two point for agree, three point for neutral four point for disagree and five point for strongly disagree.

Data Analysis and Interpretation Procedure

After the completion of data collection, the researcher had analyzed the obtained data by using the statistical procedure. The researcher analyzed the obtained data by using the Statistical Package for Social Sciences (SPSS) programmed, version 20.0. The collected data, nonparametric chi-square was used for each statement to find the attitude of students towards mathematics. By the help of chi-square test at 0.05 level of significance, researcher had found the significance of each statement of four affecting factors. The responses from interviews were analyzed by using their own words and then researcher had described in brief.

Chapter - IV

ANALYSIS AND INTERPRETATION OF THE DATA

This is a survey research related to find the students attitude towards mathematics at secondary level. This chapter presents the results of statistical analysis of collative data, which were collected from the students of grade X at Kathmandu district. From the list there are 12 secondary school were selected by the method of systematics sampling. Total of 230 students of grade X were as samples for this study. The questionnaire consists forty statements, which were developed and constituted under the guidance of supervisor. Questionnaire was the main tools for the collection of data in this research.

For scoring each item researcher used the Likert five-point scale which valued five point for strongly agree, four for agree, three for neutral, two for disagree and one for strongly disagree for positive statements. And one point for strongly agrees, two for agree, three for neutral, four for disagree and five for strongly disagree for negative statements. Regarding statistical description measures of data were analyzed by using the Statistical Package for Social Sciences (SPSS) program, version 21.0 setting 0.05 level of significance. For analyzing the data, percentage and chai- square test were used. The Collected data were analyzed and interpreted under the following headings:

Personal Factors

Candidates were asked to respond to 40 statements related to all these factors. The items designed under students' personal factors were (1-10), School related factors were (11-20), items related home were (21-30) and items related to social variables were (31-40). Attitudes of grade X students were represented by χ^2 - value on a five point scale for

positive statements, where five point was given for Strongly Agree represents the maximum score of scale and one point was given for Strongly Disagree represents the minimum score and same thing is done in negative statements. The analysis and interpretation of the data obtained from questionnaire can be presented as follows:

The following table consists the student's attitudes and it corresponding χ^2 - value of the questionnaire related to personal factors affecting attitude towards mathematics.

Table 4.1 Responses on the personal factors

Statements	SD %	D %	N %	A %	SA %	χ^2	Decision
1. Mathematics provides us with knowledge used in daily life.	0.9	5.2	12.2	45.7	36.1	179.69	S
2. Mathematics is an easy subject	3.5	19.6	25.7	44.3	7	122.83	S
3. Mathematics will not be important to me in my life work.	10.9	32.2	40	13.5	3.5	108.91	S
4. Mathematics is better than other optional subject.	0.9	9.1	17.8	62.2	10	272.26	S
5. I am not good in mathematics.	5.2	27.4	38.7	25.7	3	108.35	S
6. Mathematics has been my worst subject.	14.8	42.2	25.2	14.3	3.5	97.87	S

7. Mathematics is sufficient to select better education	1.7	12.2	20.9	57	8.3	218.39	S
8. I feel boring in the class of mathematics	7	31.3	38.6	19.6	3.5	105.87	S
9. I can get good grade in mathematics.	2.6	17.4	14.3	54.3	11.4	183.61	S
10. To take mathematics one should have strong foundation in mathematics.	0	1.7	10.4	40.9	47	136.82	S

Critical region $\chi^2 = \chi^2 \leq 9.49$ (Non-significant) $\alpha, v 0.05, 4$

The first statement “Mathematics provides us with knowledge use in daily life” is significant with the χ^2 -value 179.69 at 0.05 level of significance. A total of 81.8% students were agreed and 12.2% students were neutral about this statement. This shows that most of the students were positive with this statement. The second statement “Mathematics is an easy subject” is significant with the χ^2 -value 122.83 at 0.05 level of significance.

A total of 51.3% students were agreeing with this statement and 25.7% students were neutral about this statement. This shows that maximum students were positive with this statement. The third statement “Mathematics will not be important to me in my life work” is less significant with the χ^2 -value 108.91 at 0.05 level of significance.

A total of 43.1% of students were disagreeing with this statement and 40% students were neutral about this statement. This shows that maximum number of students

were positive about this statement. Fourth statement “Mathematics is better than other optional subjects” is significance with the χ^2 -value 272.26 at 0.05 level of significance.

A total of 72.2% students were agreed with this statement and 17.8% were undecided about this statement. This shows that most of the students were positive with this statement. The fifth statement “I am not good in mathematics” is highly significance with the χ^2 -value 108.37 at 0.05 level of Significance.

Total of 32.6% students were disagree with this statement and 38.7% were undecided about this statements this shows that maximum number of students were unanswered in this statement. On the statement “Mathematics has been my worst subject” is significance with the χ^2 -value 97.87 at 0.05 level of significance.

Total of 57% students were disagree with this statement and 25.2% were neutral with this statements. It means most of students were positive with this statement. On the statement “Mathematics is sufficient to select better education for study in higher education” is highly significance with the χ^2 -value 218.39 at 0.05 level of significance.

A total of 65.3% of students were agreeing with this statement and 20.9% were undecided about this statement. It means that most of the students were positive with this statement. On the statement “I feel boring in the class of mathematics” is highly significance with χ^2 -value 105.87 at 0.05 level of significance.

A total of 38.3% students were disagreeing with this statement and 38.6% students were undecided about this statement. It occurred that most of the students did

not feel easy in mathematics classroom. The statement “I can good grade in mathematics” is highly significance with χ^2 -value 183.61 at 0.05 level of significance.

A total of 65.7% students were agreeing with this statement and 14.3% students were neutral about this statement. This shows that most of the students were positive with this statement. On the statement “To take mathematics one should have strong foundation in mathematics” is highly significance with the χ^2 - value 136.82 at 0.05 level of significance. About this statement total of 87.9% were agree with this statements and 10.4% were unanswered about this statement. Thus most of the students were positive with this statement.

On the other hand, researcher takes an interview with students and their math teacher at sampled schools to find the affecting factors that affects students’ attitude towards mathematics. Some questions asked to students at in classroom after the returning questionnaire to researcher. The questions are included in the appendix c. In a reply students replied as: “To learn mathematics, we should do much more practice otherwise we couldn’t understand mathematical concept easily and we don’t have more time to practice in home because we should do household work too.

We are basically poor in mathematics so it is hard to understand mathematical concept and we have to fear as how can we solve the mathematics paper in examination. We are coming from very far by walking 4-5 km distance. So we have no more time for additional study at home as well as in schools. Mentally we are unable to ready for making interesting to our study and we feel mathematics is only for talent student. Thus we have fear how can we pass in examination in mathematics. It difficult to understand

without much more practice.”

Students' View

‘To learn mathematics students should have positive attitude towards it. If students have no interest to learn mathematics, they would not be able to learn it. Thus at first they should have positive thinking. In our school the students who are coming from very far, they are poor in mathematics because they have not much more time for doing practice at home. They studied mathematics only 45 min in school but they have more than 10 hours at home if they manage the time to study they can do better in mathematics. When they are coming from long distant walking, they feel tired and some are sleeping at classroom. So they couldn't be refresh for learning and unable to learn mathematics well. Thus they achieve the low grade in mathematics even they have positive attitude towards mathematics.

Teachers' View

According to students' and teachers' view in sampled schools, there are various problems that students have to face. Since students want to do better in mathematics than other subject but due to various problems they are failed. Kathmandu is economically and geographically backward district. Majority of the parents are away from home for earning money some of them are in abroad. Thus there is lack of good guidance for students, various students are poor in mathematics due to lack of additional practice at home.

At most all the students know that mathematics is used in our daily life and it is

easy to learn because school level mathematics curriculum is made according to behavioral problems. Many of the students have wrong thinking that mathematics is only for talent students, poor couldn't learn it.

To make mathematics easy students should remove the negative thinking about mathematics and they have to prepare their mind for learning. They have to make change their attitude towards mathematics for effecting learning. Some of the students were not interested in mathematics subject. There was traditional teaching strategy therefore students felt bore in their study. If students' change their mentality positively, they can easily learn mathematics and gain good grade in mathematics. Some students who are from poor family said that they have to fear about mathematical problems and they couldn't learn mathematics easily. So teacher needs to make mathematics classroom interesting and use problem solving technique in the mathematics class.

Hence, from the analysis of the above data, maximum number of students had positive attitude towards positive statements and negative attitude towards negative statements. So, it is concluded that maximum number of students in community schools in Kathmandu district at grade X had positive attitude towards mathematics.

On the other hand, qualitative data showed that students have mathematical anxiety and they feel very poor to themselves due to which they achieve the low achievement in mathematics. So they have to face various problems even they have positive attitude towards mathematics. Thus they are directly affected by personal factors pointed out in the conceptual frameworks.

School Related Factors

There were 10 statements (11-20) related to the schoolteacher and teaching. The following table consists the student's attitude towards school, teacher and teaching and its corresponding χ^2 -value of the questionnaire related to this topic.

Table 4.2 Responses on the school related factors

Statements	SD %	D %	N %	A %	SA %	χ^2	Decision
11. My teacher has been interested in my progress.	0.4	3.9	30.9	53.5	11.3	224.96	S
12. It is hard to get math teacher to respect me.	2.6	20.4	60.4	13.5	3.1	260.78	S
13. My teacher has encouraged me to study more math books.	0	8.7	16.1	64.3	10.9	192.57	S
14. Teacher has used teaching material in mathematics classroom.	2.2	14.8	23.9	53.9	5.2	198.83	S
15. Teacher beat when we get wrong answer for asked question.	13	29.1	44.8	12.2	0.9	134.91	S
16. Teacher would not take me seriously if I told them, I am interested in a career in science	10	26.1	39.6	19.5	4.8	86.44	S
17. Teacher has good content knowledge in mathematics.	0.9	3.5	20.4	60.4	14.8	264.65	S
18. Teacher give us classwork to do in group	0.9	14.8	36.5	43.9	3.9	172.13	S

19. There is math lab in our school.	16.1	36.1	28.7	17.8	1.3	80.96	S
20. Teacher thinks advanced math is waste of time for me.	12.2	44.3	33	10.1	0.4	150.30	S

Critical region $\chi^2 = \chi^2 = \leq 9.49$ (Non-significant) $\alpha, v 0.05, 4$

On the statement “My teacher has been interested in my progress” is highly significance with χ^2 -value 224.96 at 0.05 level of significance.

A total of 64.8% students were agreeing with this statement and 30.9% were disagreeing about this statement. It concluded that most of the student was positive with this statement. On the statement “It is hard to get math teacher to respect me” is highly significance with χ^2 -value 260.78 at 0.05 level of significance.

A total of 23% students were disagreeing with this statement and 60.4% were neutral about this statement. This shows that most of the students were neither positive nor negative with statement. The statement “My teacher has encourage me to study more mathematics” is highly significance with χ^2 - value 192.57 at 0.05 level of significance.

A total of 75.2% students were agreeing with this statement and 16.1% students were neutral about this statement. It means that most of the students were positive with this statement. The statement “Teacher has used teaching material in mathematics classroom” is highly significance with χ^2 - value 198.83 at 0.05 level of significance.

A total of 59.1% students were agreeing with this statement and 23.9% percent were neutral about this statement. This concluded that maximum number students were

positive with this statement.

On the statement “Teacher beat when we get wrong answer for asked question” is highly significance with χ^2 -value 134.91% at 0.05 level of significance. A total of 42.1% students were disagreeing with this statement and 44.8% students were neutral for this statement. This shows that most of the students were positive with this statement.

The statement “Teacher would not take me seriously if I told them, I am interested in a career in science” is significant with χ^2 -value 86.44 at 0.05 level of significance. A total of 36.1% students were disagreeing with this statement and 39.6% were neither agree nor disagree with this statement. This shows that maximum students were positive with this statement.

The statement “Teacher has good content knowledge in mathematics” is highly significance with χ^2 -value 264.65 at 0.05 level of significance. A total of 75.2% students were agreeing with this statement and 20.4% students were neutral about this statement. This shows that most of the students were positive with this statement.

The statement “Teacher gives us classwork to do in group” is highly significance with χ^2 -value 172.13 at 0.05 level of significance. Total of 47.8% students were agree with this statement and 28.7% were neither agree nor disagree with this statement. This shows that maximum students were positive with statements.

The statement “There is a math lab in a school” is significance with χ^2 -value 80.95 at 0.05 level of significance. A total of 19.1% students were agreeing with this

statement and 28.7% students were neutral with this statement. This shows that maximum school has not math lab. The statement “Teacher think advance math will be waste of time for me” is highly significance with χ^2 -value 150.30 at 0.05 level of significance.

Total of 56.5% students were disagree with this statement and 33% were unanswered for this statement. This shows that maximum students were positive with this statement.

Researcher asked some questions to students and their math teacher to know their view about school related factors that affects their attitudes. The questions asked to students and mathematics teacher are included in the appendix C. In reply students replied as: “Teacher didn’t care to students in mathematics class. Teacher just completes their duty. They only focus to talent students who are sitting in the front benches in the classroom. But teacher didn’t interactions with us we are sitting in the middle and last benches. Teacher couldn’t control the classroom silently and students are discussing in the out topic in the class.”

Students’ View

“It is hard to control to students in the classroom. When we are teaching in the classroom, they start out topic discussion with each other. The students who are sitting in the last benches, they have zero knowledge in mathematics. We are trying to motivate them by saying popular mathematicians’ history and other mathematical inventions but they stop their discussion for few minutes and again they start side talks each other.

We accept it is our weakness but we always trying to control but it is not possible

yet. We are using teaching materials, which are available in our schools. But due to late availability of mathematics textbook in the school we are unable to complete the course. Students couldn't understand geometry easily so we left the geometry if we have not sufficient time to complete the course of study.”

Teachers' View

In Kathmandu they're no much facility in the rural areas schools. Many of the school don't have sufficient teaching materials. There is no water supply, no comfortable desks, classroom and no math lab. At most all the school have qualified energetic and creative teacher. There is permanent teacher in all the sampled schools. But it is the issue that when teacher go to classroom for teaching mathematics students start side talk in classroom.

According to teacher the students who are sitting in the last bench they coming here only for time pass and didn't homework regularly. School management committee decided to start additional mathematics class for poor students but they did not attend the additional classes because many of the students coming from very far so they didn't have sufficient time to study in additional classes.

It also found in the sampled schools that teacher wants to do interaction with all students but when teacher asked the questions poor students stop their mouth and they didn't give the answer either it was true or wrong. But the students who are positive in classroom learning they answered the question asked by teacher. Poor students only blamed their teacher but they are not trying to learn something.

There is no possibility of effective interaction between teacher and student. All the teachers are energetic and capable in the sampled schools but there is one of the big problems as textbook is not available in time. The books are available after 2/3 months late. Also in the community schools there is more vacations happened such as 2-3 months long vacation in a year in the community based school.

Teacher who show the acceptance, clarification of students' feelings and praise have been associative with more positive attitude towards higher achievement by student. Many of the teacher often unconsciously reinforcement by validates students' perceptions of appropriate gender related behavior. Boys are assigned assertive roles and when they do well they are told they have a talent. But girls may be assigned less assertive role and when they do well in mathematics, they are reminded that have least worked hard to achieve such grades. Because of this unconscious reinforcement from teacher, boys and girls from different attitude towards mathematics.

Thus to make teaching learning activities interesting teacher have to encourage their students by giving good reinforcement and feedback equally to boys and girls. Therefore, due to all these problems many of the students are failed in the mathematics even they have positive attitude towards mathematics.

Hence, from the analysis of the data, majority of the students had positive attitudes towards positive statement and negative towards negative statements. So, it is concluded that maximum number of the students of grade X had positive attitude towards mathematics. But there are various problems arises in the school which affected students' attitude towards mathematics.

Home-Related Factors

There were ten statement (21-30) related to home environment. The following table consists the student's responses to wards home environment and its corresponding χ^2 -value of the questionnaire.

Table 4.3 Responses on the home related factors.

Statements	SD %	D %	N %	A %	SA %	χ^2	Decision
21. Guardians have positive attitude towards you while selecting math.	0.4	2.2	13.9	35.7	48.8	202.40	S
22. Guardians should help you to study at home.	1.3	3.9	8.7	53	33	229.78	S
23. Economic background affecting while studying math.	0.4	2.6	25.7	58.3	13	256.39	S
24. Guardians play a vital role for learning mathematics.	0.4	3	16.1	55.3	25.2	224.61	S
25. Guardians does not provide sufficient material for studying math at home.	7.4	39.1	40.9	10.4	2.2	157.52	S
26. My parents did not encourage for selecting optional mathematics.	15.2	37.5	34.3	11.3	1.4	108.13	S
27. I use internet for learning mathematics at home.	20	36.1	33.4	9.6	0.9	105.26	S

28. I have no more time for studying math at home.	4.8	33.9	40.4	17.8	3.1	130.52	S
29. Family background affect while choosing the math.	3.5	4.8	13	72.6	6.1	293.13	S
30. My parents help me for solving math problems at home.	1.3	6.1	20	41.7	30.9	130.39	S

Critical region $\chi^2 = \chi^2 \leq 9.49$ (Non-significant) $\alpha, v 0.05, 4$

On the statement “Guardian have positive attitude towards you while selecting mathematics” is highly significance with χ^2 -value 202.4 at 0.05 level of significance. A total of 85.3% students were agreeing with statement and 13.9% were neutral about this statement. This shows that most of the students were positive with this statement.

On the statement “Guardians should help you to study at home” is highly significance with χ^2 - value 229.78 at 0.05 level of significance. A total of 86% students were agreeing with these statements and 8.7% were neutral with this statement. This shows that most of the students were positive with this statement.

On the statement “Economic background affecting while studying mathematics” is highly significance with χ^2 -value 256.39 at 0.05 level of significance. A total of 71.3% students were agreeing with this statement and 25.7% were unanswered for this statement. This shows that maximum number of students were positive with this statements.

On the statement “Guardian play a vital role for learning mathematics” is highly

significance with χ^2 -value 224.61 at 0.05 level of significance. A total of 80.5% students were agreeing with this statement and 16.1% students were undecided about this statement. This shows that most of the students were positive with this statement.

The statement “Guardians does not provide sufficient materials for studying math at home” is highly significance with χ^2 -value 157.52 at 0.05 level of significance. A total of 46.5% students were disagree and 40.9% students were undecided this statement. This shows that maximum students were positive with this statement. The statement “My parents do not encourage for selecting optional mathematics” is highly significance with χ^2 -value 108.13 at 0.05 level of significance. A total of 52.7% students were disagreeing with this statement and 34.3% students had undecided this statement. This shows that maximum students were positive with students.

The statement “I use internet for learning mathematics at home” is highly significance with χ^2 -value 105.26 at 0.05 level of significance. Out of hundred only 10.5% students were agreed with this statement and 33.4% students were unanswered for this statement this shows that most of the students did not use internet to learn mathematics at home.

The statement “I have no more time for studying math at home” is highly significance with χ^2 -value 130.52 at 0.05 level of significance. A total of 38.7% students were disagreeing with this statement and 40.4% were unanswered with this statement. This shows that most of the students were neither positive nor negative with this statement.

The statement “Family background affect while choosing the mathematics” is highly significance with χ^2 -value 293.13 at 0.05 level of significance. A total of 78.7% students were agreed with this statement and 13% were neutral for this statement. This shows that most of the students were positive with this statement.

The statement “My parents help me solving mathematical problem” is highly significance with χ^2 -value 130.39 at 0.05 level of significance. A total of 72.6% students were agreeing with this statement and 20 % were neutral with this statement. Hence most of the students were positive with this statement.

For qualitative data researcher take an interview with students and mathematics teacher in the sampled schools on the basis of some open-ended questions which are included in the appendix c. On the reply they replied as:

“Our father and mother both go to work out in the field and that time we have to help them working in the field and other house hold works. So we don’t get enough time to study at home, our parents are uneducated so they couldn’t help to us for solving mathematical problems and due to heavy workload at home we couldn’t come to schools regularly. So we are unable to get good marks in mathematics even if we want that.

Students’ View

“Many of the students are helpless from their home in the case of study. Their parents have low qualification, economical problem, and time availability for study at home etc. Many of the parents are farmers and they have to work in the fields and so they want help from their children for working together in the field. When the heavy work

load in the home their children doesn't come into school. Some parents want boys should go to schools and girls should do household work. So girls are not coming regularly in the school.

Teachers' View

Students have much more time at home for study than school if they are not busy in household work. Many of the parents are uneducated in the society and they didn't care about their children study as their performance in the school. But educated people has positive attitude as they give more time to their children in home and they help to them for solving mathematical problems in home.

Thus the children from educated family are comparatively better than students from uneducated family. All the parents want their children bright future but there is some weakness is the couldn't give much more time to their children study. For the better study home environment should be peaceful and clean but in many of the society some uneducated parents are crying after drinking alcohol at night.

Thus to promote children study parents should give much more time to their children for study at home and they should do equal behavior to their son and daughter. Also they have to provide them to necessary materials and they should to cooperate and communicate the teacher in the school. Also parents need to know the information about their children whether they are attending in classroom or not. Thus if parents help to their children in every time then they can study well and get good grade in mathematics as well as other subject. In many of the societies researcher found some gender biasness.

Some family doesn't send their daughter to school for four days when they became in period. Also they not allowed studying at home for four days. It is also found that boys are free at home and they have enough time to study at home where as girls should help household work first and after the completion of the work they go for study.

Thus it is found that boys have positive attitude than girls. Thus parents are responsible in students' progress thus they need to do equal behavior to their children. AS a hole from above data analysis majority of the students had positive attitude towards positive statements and negative attitude towards negative statements. So, it is concluded that majority of the students of community school at grade X in Kathmandu district had positive attitude towards mathematics. On the other hand, from qualitative data it can be concluded that many of the students have to face various problems during their study time so they are unable to show good performance in examination even they want.

Social Factors

There were ten statements (31- 40) related to students' response towards social variables. The following table consists the students' responses towards social variables.

Table 4.4 Responses on the social factor.

Statements	SD %	D %	N %	A %	SA %	χ^2	Decision
31. It is hard to believe girls could be genius in mathematics	4.3	37.5	43.9	11.7	2.6	171.35	S
32. The selection of mathematics subject makes a smart and distinct to themselves	0.9	4.8	25.2	65.6	3.5	263.91	S

infect of their friend.							
33. Mathematics is male domain subject.	10	44.8	36.5	7.4	1.3	172.00	S
34. Studying math is just as good for girls as for boys.	0	3	8.7	77.4	10.9	239.70	S
35. Social environment affects the learning mathematics.	0.4	1.7	14.8	68.3	14.8	287.47	S
36. Boys are not naturally better than girls in mathematics.	5.7	47.4	38.7	6.5	1.7	209.39	S
37. The society members respect you when you get good grade in mathematics.	0	3.9	12.2	59.6	24.3	166.00	S
38. Mathematics is usefulness in society.	0.8	3.5	20	68.3	7.4	249.61	S
39. Girls can do just as well as Boys in mathematics.	0.5	2.6	6.1	71.7	19.1	290.31	S
40. When girls have to solve math problems they asks for boy.	1.3	30.4	47.4	15.2	5.7	165.30	S

Critical region $\chi^2 = \chi^2 \leq 9.49$ (Non-significant) $\alpha, v 0.05, 4$

The statement “It is hard to believe girls could be genius in mathematics” is highly significance with χ^2 -value 171.35 at 0.05 level of significance. A total of 41.8% students were disagreeing with this statement and 43.9% were unanswered for this statement. This shows that most of the students were positive with this statement.

The statement “The selection of mathematics makes a smart and distinct to

themselves infect of their friend” is highly significance with χ^2 -value 263.91 at 0.05 level of significance. A total of 69.1% students were agreeing with this statement and 25.2% students were neutral with this statement. This shows that most of the students were positive with this statement.

The statement “Mathematics is male domain subject” is highly significance with χ^2 -value 172 at 0.05 level of significance. The total of 54.8% students were disagreeing with this statement and 36.5% were undecided for this statement. This concluded that more than 54% students were positive with this statement.

The statement “Studying mathematics is just as good for girls as for boy” is highly significance with χ^2 -value 239.70 at 0.05 level of significance. A total of 88.3% students were agreeing with this statement and 8.7% students were unanswered for this statement. Hence we concluded that most of the students were positive with this statement.

The statement “Social environment affects learning mathematics” is highly significance with χ^2 -value 287.47 at 0.05 level of significance. The total of 83.1% students were agreed with this statement and 14.8% were neutral with this statement. This shows that most of the students had positive attitude with this statement.

The statement “boys are not naturally better than girls in mathematics” is highly significance with χ^2 -value 209.39 at 0.05 level of significance. The total of 53.1% students were disagreeing with this statement and 38.7% were neutral for this statement.

This shows that majority of students were positive with this statement.

The statement “the society member respect you when you get good grade in mathematics” is highly significance with χ^2 -value 166 at 0.05 level of significance. A total of 83.9% students were agreeing with this statement and 12.2% students were unanswerd for this statement. This shows that majority of the students were positive with this statement.

The statement “mathematics is usefulness in society” is highly significance with χ^2 - value 249.61 at 0.05 level of significance. A total of 75.7% students were agreeing with this statement and 20% were neutral with this statement. Thus majority of the students were positive with this statement.

The statement “girls can do just as well as boys in mathematics” is highly significance with χ^2 -value 290.31 at 0.05 level of significance. A total of 90.8% students were agreeing with this statement and only 6.1% were neutral with this statement. Thus most of the students were positive with this statement.

The statement “when girls have to solve the mathematics problems, they asks the boys for help” is highly significance with χ^2 -value 165.30 at 0.05 level of significance. The total of 31.7% students were disagreeing with this statement and 47.4% students were neutral about this statement. This shows that majority of the students were positive with this statement.

For qualitative data researcher take an interview with students and teachers at

sampled schools by asking some questions mentioned in the appendix C. They replied as “Educational society always be positive towards students’ progress and they can raise their hand for helping economically poor students who cannot studying regularly in school. Also they can help by stop the gender discrimination in the society and they have to change their attitude towards girls.”

Students’ View

“Students are directly influenced by society. Mathematics is developed by society and it is useful too. If the talent students are awarded by society then they can do better in future and they motivate poor and they can try to study more. Also if social people help to buy mathematical materials and other facility in the school then we can easily use those materials in classroom too. Thus students are positively impressed by them.”

Teachers’ View

In the development of mathematics society play a vital role. Mathematics is directly related to society the mathematical problems are included according to social needs. Thus mathematics learning is also related with society. People can help to reduce mathematical anxiety of students and prepare them to ready physically and mentally. People should have to encourage for learning mathematics. In the research areas researcher found that society, students and schools are not linkage each other.

Researcher found there is social discrimination with students’ they dominate to Dalit students, girls’ students and poor students’. Mainly Dalit students and girls’ students doesn’t get the chance to go to school regularly and are unable to do their

homework. If they miss the mathematics class, then next day they feel difficult to solve the mathematical problems which missing. Many of the students in mathematics classroom come from diverse background in terms of their social belief, tradition culture throughout. Such diversity was beneficial to not all students to learn math. It was cause to back draw in math achievement. It means that society related factors also contribute to shape students' attitude towards on additional mathematics.

Hence, from the analysis of the data, majority of the students had positive attitude towards positive statement and negative attitude towards negative statement. So, it is concluded that majority of the students of community schools of Kathmandu district at grade ten had positive attitude towards mathematics.

Also χ^2 - value of each statement is significant, all components taken for survey were highly significant. It shows that most of the students had positive attitude towards mathematics. Hence, researcher concluded that, there are so many factors arises in front of students and teacher in secondary level thus these factors affects the students' attitude towards on additional mathematics.

Chapter – V

FINDINGS, CONCLUSION AND IMPLICATION

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

Findings of the Study

Mathematics is the most useful subject in our daily life. So it is taught at every level of our formal education. But most if the student fails in this subject. It is due to lack of qualified teacher, lack of math lab, access of internet, lack of trained teacher, lack of teaching material, due to backward society due to lack of educated guardians all these factor becomes cause of low achievement in SLC examination. So that researcher had tried to study with purpose to determine the factors that affect student attitude towards mathematics at Kathmandu district.

For this study 230 students from 12 community based schools of Kathmandu district were selected by the method of systematic sampling in first phase and twenty students were selected by purposive sampling in second phase. In the first phase researcher set the closed ended questions for survey and ten open ended questions were asked for interview with students to find affecting factors that effects on student attitudes towards to additional mathematics. For quantitative part researcher had used “Likert Attitude scale” for scoring the obtained data.

For survey, researcher had prepared a questionnaire contains 40 items. The

questionnaire is designed as 5-point Likert's scale. In questionnaire 15 statements were negatives and other 25 statements were positives. These statements were categorized into four categories according to conceptual framework. In each category 10 statements were included. On the other hand, 10 open ended were designed for interview with students and five statements were for teacher and the questions were asked for purposively.

The chi-square test and percentage of responses for the statements was used to find the attitude of students towards to additional mathematics at grade X. And open ended question were asked to find affecting factors in student attitude towards mathematics. The collected data were analyzed following major findings of the study.

- The majority of the students have positive attitude towards on additional mathematics at grade X.
- It has been found that teaching learning process, use of teaching materials, teacher's qualification, interest of learner students as well as parents' expectation, and beliefs affected student attitude towards on additional mathematics at grade X.
- It has been found that home environment such as gender bias at home, parents' education, practice time given to students, parent's economic background, study hour at home affected the student attitudes towards to additional mathematics.
- The school environment, such as physical facilities, classroom management, teacher student interaction, teacher behavior towards student affects the student attitude towards additional mathematics.

- Social variables such as gender bias, social discrimination; social tradition, culture, etc. also affect the student attitude towards on additional mathematics at grade X.

From analysis most of the students feel difficulty in solving mathematical problems and comparing the overall meaning of mathematics and make mistake in solving the problems. Most of the students don't know the importance of mathematics for the further study. They don't know the usefulness of mathematics in our daily life.

Conclusion

This study tries to find out the attitude of grade X students towards and affecting factors in student attitude towards on Additional Mathematics at grade X. After the analysis and interpretation of the data from primary sources it was found that maximum students had positive attitude towards Additional mathematics at grade X but they have to facing so many problems due to which they couldn't get good grade in mathematics. Except some students, all remaining students had positive attitude towards mathematics.

It is also found that student confidence level, their anxiety towards on additional mathematics, lack of guardian qualification, home environment, school environment, social variables as social discrimination, social culture is appeared as main affecting factors that affects student attitude towards on additional mathematics.

Thus, this research concluded that government should provide teaching materials to all schools and must give training to teacher and guardian should give more time to their children for practice in home. Also they should interact with mathematics teacher

and principle to know student participation in classroom learning. Also society should change their behavior towards children and behave equally to all children even they are Dalit.

Implication

The conclusion of the study cannot be generalized to all areas due to the limitation contained in this study. Thus after analyzing the conclusion and implication of the study the researcher has made the following recommendations or suggestions for further studies.

- The study is done only in Kathmandu district as a case. For generalization of case the study similar study should be done in a wider scope and large sample.
- The backward society many people have narrow mind so government should have to lunched the new programs which can help to change their thinking and do equal behavior to all children.
- School should provide free extra classes for those students who get low marks.
- Trainings are provided to all teachers and it should be made more effective.
- Government should provide mathematical lab for every secondary level school.

- Guardians should provide more time for practice to their children in home.
- Society should stop the social discrimination and gender bias to all children.
- Government should provide mathematics books for all students in time.
- Teacher should study the curriculum and follow the teacher's guide during teaching.
- Government should help to teach through Midas App if possible.

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Appendix A

Sampled schools selected for study by systematic sampling

Shree Manshing Dharam secondary School Tarkeshower – 10, Kathmandu.

Shree Tarun secondary School Mahanagarपालिका – 16, Kathmandu,

Shree Manamaiju Higher Secondary School, Tarkeshower – 9, Kathmandu

Shree Futung Higher Secondary School, Tarkeshower, Kathmandu

Shree Kalidebhi Pravidhik Higher Secondary School, Kabhresthali, Kathmandu

Shree Dharma Sthali Secondary School, Dharmsthali, Kathmandu

Shree Nagarjun Higher Secondary School Tarkeshower – 5, Kathmandu

Shree Gudheshori Higher Secondary School, Tarkeshower, Kathmandu

Shree Peace Land Academy School Tarkeshower – 5, Kathmandu

Shree Good Start Academy School Tokha – 3, Kathmandu

Shree Bishnu Mati Secondary School Tokha – 5, Kathmandu

Shree Dipjyoti Secondary School, Tokha – 6, Kathmandu

Appendix B

Attitude Questionnaire

Dear students,

As students of Master Degree in Mathematics Education, I am going to conduct “Students Attitude Towards on Additional Mathematics at grade X” In this study it is a part of the academic requirement for the Master Degree in Education. For this purpose, I distributed 40 statements concerned with attitude please study the statement carefully and give your own opinion by putting tick marks (√) on any one of the following five rating of each statement.

School Name..... Subject.....

Students Name..... Class.....

Sex.....

S.N	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Mathematics provides us with knowledge use in daily life.					
2.	Mathematics is an easy subject.					
3.	Mathematics will not be important to me in my life work.					

4.	Mathematics is better than other optional subjects.					
5.	I am not good in mathematics.					
6.	Mathematics has been my worst subject.					
7.	Mathematics is sufficient to select better education for study in higher education.					
8.	I feel boring in the class of mathematics.					
9.	I can get good grade in mathematics					
10.	To take mathematics one should have strong foundation in mathematics.					
11.	My teacher has been interested in my progress.					
12.	It is hard to get math teacher to respect me.					
13.	My teacher has encouraged me to study more mathematics.					
14.	Teacher has used teaching material in mathematics classroom.					
15.	My teacher beat when we get wrong answer for asked					

	question.					
16.	My teacher would not take me seriously if I told them, I am interested in a career in science					
17.	Teacher has good content knowledge in mathematics.					
18.	Teacher gives us class work to do in-group.					
19.	There is math's lab in our school.					
20.	Teacher thinks advanced math will be a waste of time for me.					
21.	Guardians have positive attitude towards you while selecting math.					
22.	Guardians should help you to study at home.					
23.	Economic background affecting while studying mathematics.					
24.	The guardians play a vital role for learning mathematics.					
25.	Guardians do not provide sufficient materials for studying math at home.					

26.	My parents do not encourage for selecting optional mathematics.					
27.	I use internet for learning mathematics at home.					
28.	I have no more time for studying math at home.					
29.	Family background affect while choosing the mathematics.					
30.	My parents help me for solving mathematical problems.					
31.	It is hard to believe a female could be genius in mathematics.					
32.	The selection of mathematics subject makes a smart and distinct to themselves infect of their friend.					
33.	Mathematics is male domain subject.					
34.	Studying math is just as good for girls as for boys.					
35.	Social environment affects the learning mathematics.					
36.	Males are not naturally better than females in mathematics.					

37.	The society members respect you when you get good marks in mathematics.					
38.	Mathematics is usefulness in society.					
39.	Girls can do just as well as Boy's in mathematics.					
40.	When girls have to solve a math problem, she could ask boys for help.					

Thank you for Cooperation

Appendix C

INTRVIEW GUIDELINE FOR STUDENTS AND TEACHERS

For students

- Is your teacher use teaching material in mathematics classroom? It teaching materials helpful for effective learning?
- Is mathematics really difficult than other subject? If not, why didn't select optional mathematics at grade IX?
- Do you fear to solve mathematical problems? Why?
- Is your teacher done interaction with you when teaching math in classroom?
- Does your parent really help you for learning mathematics? If not, why?
- Economic background really affects in learning mathematics.” Are you agreeing with this statement? How?
- Social discriminant affects the learning mathematics.” What do you think about this statement?
- How is your teacher's classroom performance?
- Is you attending mathematics class regularly and do homework regularly? If not, why?
- Do your parents provide all materials you need for practice mathematical problems at home?

For teacher

- Do you use teacher materials in classroom? Which teaching method do you use in mathematics classroom?
- Do you do interaction with your students in the classroom?
- Why the result is going low every year in mathematics at your school?
- Do you follow the teacher's guide and follow make lesson plan before teaching?
- Did you take any training given from government? What may be the benefits of teaching training?
- How do you believe that mathematical achievement affects the students' attitude towards the subject?
- How society can affect the students' attitude towards mathematics?
- Do you agree that parent's economic status affect student's attitude? How?
- Is gender discrimination affects students' attitude? How?
- Do you check the homework regularly?

Thank You for Your Cooperation