

## Chapter – I

### INTRODUCTION

#### Background of the Study

Today's world is diverse in terms of culture, race, ethnicity, religion, and so on. Nepal is also home to 59 ethnic groups and 125 languages (CBS 2011). Multicultural education is very important in this context. Hence ethno-mathematics plays an important role for the development of mathematical knowledge of the indigenous groups.

The word Ethnic means easterner, that is, one who lives on the eastern side. 'Sher' means east and 'pa' means dweller. Because the Ethnic live on the north eastern part of Nepal, that's why they are come to know as the Ethnics. The Ethnic people in the north central of Nepal are one of ethnic groups with their own mathematical knowledge, concepts and process. They use mathematics every day in their lives while praying with beads in their hand. Ethnic live in difficult terrain in the remote hills and mountains of Nepal (Ethnic, 2008). The geographical remoteness coupled with prevailing poverty has kept many Ethnic children out of school for decades. This has also resulted in Ethnic children not learning mathematics for many decades now. Ethnic have the literacy rate of 41.23%. Their total population in Nepal 154,622 heads where 77,511 are male and 77,111 are female (CBS, 2011). Even today Ethnic children are mostly involved in household chores which keep them out of school often. This has impacted their learning in mathematics as well as other subjects. Hence the objective of this thesis is to evaluate the performance of Ethnic students from grade IX in mathematics.

The performance evaluation of the students can be made on the basis of the test in the form of examination conducted at different times in the session. These kinds of test are basically designed to measure knowledge, understanding and skills of the students in a specific subject or group of subjects.

Achievement is determined by different variables such as school related variables, student related variables and house related variable and so on. These variables are entirely related to the achievement obtained by students. The school

related variables refer to the learning environment at school, the academic qualification of teachers, teaching experiences and ability of the school, types of instruction, materials used, students-teacher's ratio, physical status and so on.

### **The Ethnic and Academic Performance in Mathematics**

It is found that most of the school students fail in District level Examination (DLE) or send-up or SLC examination due to the failure in mathematics rather than other subjects (Personal observation 2015). Mathematics is considered a comparatively difficult subject than other. Many students feel difficulty, dissatisfaction, hesitation and fear in this subject, which leads them to the failure in mathematics. Not only the lower caste students but also the upper caste students are found to have failed in mathematics. Failure in mathematics seems to be a common phenomenon irrespective of students' caste. Hence failure in mathematics is not a problem associated only with Ethnic students. Some studies have assessed the factors affecting the achievement of mathematics by students from Satar, Rai, Pahari and Tamang ethnic groups however there have not been any prior study regarding the factors concerning the achievement of mathematics by Ethnic community students. Hence this study would explore the factors affecting the achievement of Ethnic students in mathematics.

### **Statement of the Problem**

There is no equal access to education of all the castes and ethnic groups by the causes of language, interests, geographical situation and possibilities.

The Ethnic are one of the indigenous, backward, and disadvantages groups and their cultural activities are different from other communities. The Ethnic students are affecting mathematics achievement of Ethnic students in Kathmandu district and consequently demonstrate a poor learning outcome. So this study was concerned with finding out the level of achievement of Ethnic students in mathematics in Kathmandu district.

## **Objectives of the Study**

The objectives of this research were:

- To find out the factors that determined Ethnic students' mathematical results.
- To Suggest some remedies to reduce affecting factors.

**In this context this study wants to answer the following questions.**

The proposed study was focused on:

- What are the factors that affected Ethnic student's mathematical results?
- Why do ethnic students have lower achievement than the non-ethnic students in mathematics?

## **Significance of the Study**

In order to understand students' mathematics achievement comprehensively, it is insufficient to look at just the influence of gender – boys and girls, location – rural and urban and sector – public and private schools. Sound knowledge of what and how personal, environmental factors affect students' achievement needs to be accepted by educational planners, policy maker, curriculum developer, teacher educator, teacher and parents with the task of formulating appropriate strategies, techniques and policies to bring into effective mathematics instructions in the country.

Mathematics has continuously developed and changed according to the changes of needs of human beings. Mathematics is an essential part of school curriculum. So mathematics curriculum is included as a compulsory subject at school level. Mathematics is co-related subjects to other. So every student needs the fundamental knowledge of mathematics to solve his /her daily life problems. Though, the importance of mathematics is universally accepted, there are more than average cases of failure in mathematics. There are a number of reasons for failure in mathematics. Most of the researches had compared mathematics achievement of students on the basis of ethnicity, parent's education, occupation, and income; also they had found their effect on mathematics achievement. Those researchers found the different causes of low achievement in mathematics. But no studies have been conducted concerning the factors that affect the achievement of Ethnic students in

mathematics. Hence this study would be helpful to determine the influencing factors determining the achievement level of Ethnic students in mathematics. Moreover, this study would also determine why achievement level is high or low.

The following are the significance of this study:

- This study would be useful for teacher, parents, math educators, curriculum designer, education planner, researcher and other interested persons.
- This study would be helpful for NGO, INGO and related committees for implementing suitable educational projects.
- This study would provide the information to the teachers regarding to low or high achievement in mathematics and will help to create appropriate teaching learning environment in their class.

### **Hypothesis of the Study**

Ethnic students are highly affected in comparison to non-ethnic students in terms of mathematic achievement.

### **Delimitations of the Study**

Followings are the Delimitations of the study:

- Students from only five schools of Kathmandu district were surveyed.
- The sample of this study included the students of grade IX.
- This study was conducted only for the subject of mathematics.
- This study was carried out within the certain particular area of Kathmandu district and so its findings should be generalized carefully.

### **Definitions of Terms Used**

**Ethnic Group:** It refers to a specific group of people having common culture, tradition and language

**Ethnicity:** An ethnic group; a social group that shares a common and distinctive culture, religion, language and other.

## Chapter – II

### REVIEW OF RELATED LITERATURES

A number of books, research reports, papers and other booklets have been found that were concerned with the achievement of different ethnic groups. Different researchers have done the study on comparative study of mathematics and factor affecting the achievement of different ethnic groups in mathematics. However, the researcher could not find the study on “factor affecting the achievement of Ethnic students in mathematics.” Therefore, the researcher studied on this topic.

CERID (1980) did a research on "Achievement study of primary school children" including the three district from each four development region (excluding mid-western). It found that students are found to do poorly in the tests on comprehension, writing sentences with understanding and dictation exercises. The performance of students in various aspects of the arithmetic portion of the test showed that the students were weak in understanding the place value of numbers, the concept of fractions and the application of four simple rules.

EDSC (1997) studied on "National achievement level of grade 3 students" and found that achievement scores of private school students were found more than public school students. It also found many other influencing factors in the student's achievement like students, teacher, and parents influenced positively in the better achievement of their children.

Neupane (2001) conducted a research on "Mathematics achievement of primary school children of various ethnic group in Nepal" including 500 grade five children and their parents from five ethnic groups of western development region in Nepal. The researcher found that mathematics achievement of the children varies by ethnicity, location, parent's involvement and some biographical factors. Achievement level of hill area's children in mathematics was superior to that of the Terai areas.

Bharati (2003) conducted a research on "Mathematics achievement of Hindu and Muslim students at primary level". The researcher selected 120 students of grade V from two districts of Nepal. The main objective of the study was to compare the mathematics achievement of Hindu and Muslim students. The study found that the

mean score of Hindu students was significantly higher than of Muslim students. Similarly, boys were found to be significantly better achievers than girls.

Regmi (2004) did a research on "A study of achievement in Mathematics of Gurung and Kumal students at primary level". He selected eight public schools and 118 students to find out the differences in mathematics achievement of Gurung and Kumal students. His findings concluded that the mean achievement between Gurung and Kumal. While the achievement of Gurung girls differed significantly from that of Kumal girls. Another crucial aspect of the study was that the mean achievement of non-mother tongue speaking Kumal students differed significantly from that of Mother tongue speaking Kumal students. Similar finding was found regarding the case of the Gurung students.

Tharu (2005), conducted a study entitled "Impact of socio-economic Status on Mathematics Achievement" including 16 students (78 boys and 81 girls) of grade 'X' of a selected four secondary school in Bardia district. He studied using achievement test paper to find the achievement of students of different socio-economic status and collected the information about socio economic status by using questionnaire tools for students as well as their parents .From this study he found that mathematics achievement of students were strongly associated with the socio-economic status of the children.

Neupane (2006) conducted a research on "Effect of socio-economic status on Mathematics Achievement". For this study, the researcher developed the achievement test paper, parents' questionnaire form and 84 sample students of grade III from V government schools' of Lamjung district. From his research, he concluded that the score obtained by students in mathematics was founded significantly correlated with parents' education, occupation, family size and structure of family. Also, parents occupation, family size and structure of family were found negatively correlated with mathematics achievement.

Pantha (2006) studied "The Parents' Ooccupation and Their Children's Achievement in Mathematics". The result of his research showed that the students' level of achievement differs according to their parents' occupation. Among four different occupational groups, it was found that children of job holders have high achievement level in mathematics. In comparison to the job holder, businessman,

farmer and others' children have high achievement level respectively. The result also showed that the students who got high facilities have high achievement level in mathematics

Budhathoki (2006) conducted a research on "A comparative study on student's achievement in mathematics of lower secondary level in different ethnic groups". The prime theme of this study was to explore the mathematics achievement of Brahmin, Chhetri and Magar students at secondary level in Rukum district and make a comparative study of this achievement. It was found that the Brahmin students achieved significantly higher than Chhetri and Magar students in District level examination 2061. This study has found that there is significant difference in mathematics achievement of Brahmin, Chhetri and Magar students at lower secondary school in this district.

Pandey (2007) conducted a research on "Factor influencing mathematics achievement: A case study of ineffective secondary school of Kailali district". This study was done in one of the secondary schools of Kailali district. Poudel (2007) did a research on "A study to compare the student's achievement in mathematics between Kami and Gurung students at grade VIII". He selected only Syangja district. Purposive sampling method was chosen to sample 120 students. Boys and girls students were selected proportionally from each school. His findings were that the mean achievement of Kami students in mathematics is equal to the mean achievement of the Gurung students. i.e. No variation is seen in mathematics achievement of Kami and Gurung students.

Bhagat (2007) did a research on "A study on mathematics achievement of primary level students from Rai and Tharu communities in Udaypur district". The study concluded that the achievement of Tharu students was higher than Rai students.

Pandey (2008) studied on "Causes of low achievement in mathematics". His study was survey type in qualitative nature. He used stratified sampling method, data were collected by questionnaire and concluded that achievement of students is always affected by different variables such as school's learning environment, facilities at home, and classroom practice and so on. Lack of classroom practice was found to be the main cause of low achievement in mathematics at school.

Yadav (2008) held a study about "Cause of Low Achievement in Mathematics". This study was concluded with the sample size of five musahar students. The students were selected by random sampling process. Different tools such as : observation , interview and written tests were applied to find the causes of low achievement in mathematics. He concluded the following facts :

- ) Language plays vital role in mathematics learning due to lack of proper understanding of language that causes low achievement.
- ) The socio-economic condition plays also a vital role in mathematics learning.
- ) Motivation plays another role to learn mathematics but they don't get motivated from their parents and teachers.
- ) Learning environment plays vital role in better performance in mathematics learning due to poverty.

Sahi (2010) conducted "Factors affecting achievement of Dalit students in mathematics: A case study in Doti district". Only six mathematics failed dalit students and their parents and six peer groups were chosen for the study. The study showed that participation of dalit students is less than non-dalit students. Irregularity is one of the causes of dalit students failing in mathematics.

The above review has revealed that the achievement level of ethnic group students in mathematics is different from each other. Likewise, the achievement scores of private school students were found to be higher than public school children. Similarly, the achievement of indigenous, disadvantaged and marginalized group students in mathematics is found to be lower than others.

### **Theoretical Construction**

There are many theories about learning and development of children such as classical conditioning, operant conditioning, trial and error, and so on.

### **Social Cognitive Theory**

The Social Cognitive Theory (SCT) explains how people acquire and maintain certain behavioral patterns, while also providing the basis for intervention strategies (Bandura, 1997). Behavioral change depends on three factors, viz., environment,



people and behavior. SCT provides a framework for designing, implementing and evaluating programs.

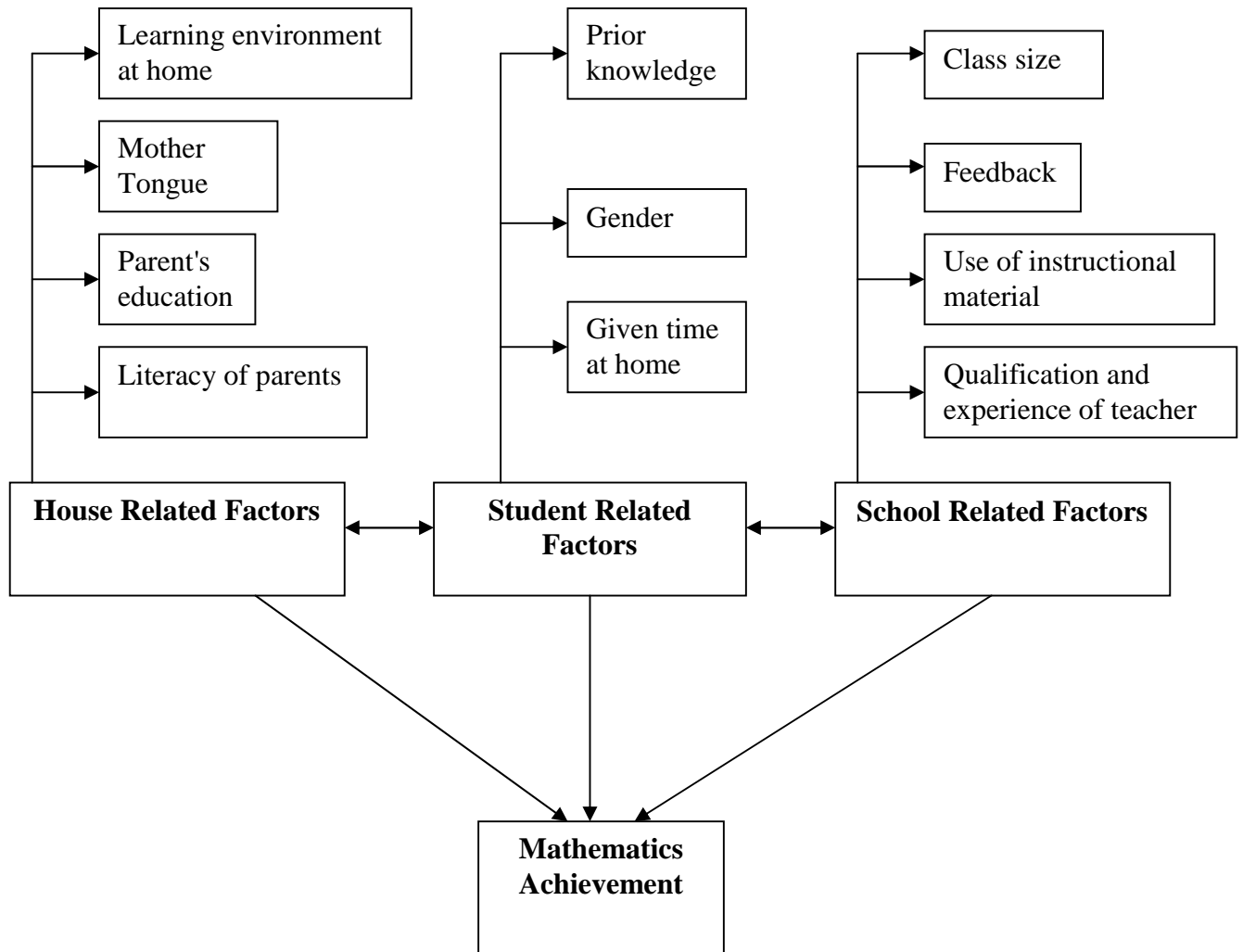
Environment and situation provide the framework for understanding behavior (Parraga, 1990). The situation refers to the cognitive or mental representations of the environment that may affect a person's behavior. The situation is a person's perception of the place, time, physical features and activity (Glanz et. al, 2002).

The three factors environment, people and behavior are constantly influencing each other. Behavior is not simply the result of the interaction between a person and environment, just like the interaction between person and his/her behavior doesn't result in environment (Glanz et. al, 2002). The environment provides models for behavior. When learning happens by looking at others and internalizing what he/she sees then it is termed observational learning (Bandura, 1997). The concept of behavior can be viewed in many ways. Behavioral capability means that if a person is to perform a behavior he must know what the behavior is and have the skills to perform it.

From the above points we can summarize by the following diagrammatic representation.

## Conceptual Framework of the Study

Different styles of learning and theories of learning are key literature of the study. So explains the factors as well as their interaction on the learning and results of Ethnic students in mathematics.



## **Chapter – III**

### **METHODS AND PROCEDURES**

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

This study was intended to assess the factors that impacted the achievement level of Ethnic students in mathematics. It made use of both quantitative and qualitative data. Therefore, it was based on the “mixed method” (Creswell, 2003) design and both quantitative and techniques used to analyse in this study.

#### **Sources of Data**

The research was mainly based on primary data. The primary data was collected by the researcher by visiting the selected schools.

#### **Population of the Study**

All the students who studies in public secondary school of kathmandu district who had recently completed grade IX were considered as the population of the study.

#### **Sample of the Study**

For this study, five secondary schools were selected by applying stratified random sampling method. Sample size included 60 Ethnic who had recently completed grade IX. Both boys and girls students were included equally in the sample. Structured questionnaire were provided to 20 low achievers Ethnic students (n=20) for filling up. However to study the factors influencing the level of achievement in students five math teachers, five head teachers, five low achiever students, and five parents were selected.

#### **Tools for Research**

The collection of the data for the study had been done with the help of interview schedule which included questionnaire. So the interview schedule was the main tool of this study. Class observation form and other school-documents such as marks ledger are also used to collect the data.

## **Questionnaire**

This study was related to influence of home related, students related and school related factors. Hence questionnaire was developed to collect the data on these particular factors. To acquire the responses relevant to the study, different questions from grade IX curriculum were set based on learning theories.

## **Interview Schedule**

The researcher used interview schedule to find out the information about the low achievement from respondents who included student (n=20), head teachers (n=5), mathematic teachers (n=5), and parents (n=5).

## **Item Analysis**

The researcher administered the test among 30 students of Bhimsengole Secondary School, New Baneshwor, Kathmandu for the pilot testing of the achievement test. Before administering the test paper, researcher instructed the students how to respond the test. To finalize the item of the test, item analysis was done by researcher himself. Level of difficulty (D) and power of discrimination of each item was calculated from 27% of higher scores i.e., 8 students from higher scores and 27% of lower scores i.e., 8 students from lower scores.

The table (appendix-B) of item analysis shows the level of difficulty (P%) and power of discrimination (D) of each items. After item analysis some questions were modified and some were cancelled. The items having D value above 0.20 and P value between 30% and 70% were accepted. The items having D value less than 0.20 were modified and the items with P value above 80% and below 30% were cancelled. 11 items of a pilot study were cancelled and 3 questions were modified. Finally 30 questions were included for the final achievement test.

## **Reliability and Validity of the Data**

To establish the reliability of the test, every test item was piloted before it was administered. In present study, the split half method of reliability of the test was determined. The reliability of the test was found 0.83. It indicates that test was reliable. For the validity of the questionnaire, questions were established by expert

opinion such as subject teacher and supervisor. The test items were selected or prepared on the basis of the secondary level math curriculum. Therefore, the test items were prepared to measure the achievement of mathematics as prescribed in their curriculum. At last questions were refined by modifying and cancelling some of its item according to the suggestions from the subject expert and thesis supervisor.

### **Scoring Procedure**

Weightage of 5, 4, 3, 2 and 1 were assigned to each of the statements if the response was “strongly agreed”, “Agreed”, “Undecided”, “disagreed”, and “Strongly Disagreed” respectively. For negative statement weightage were assigned in reverse order i.e., 1 for “strongly agree”, 2 for “agree” .....and 5 for “strongly disagree”. Further to make analysis and interpretation, the five point Likert scale was termed to three, combining “strongly agree” and “agree” on single category and similarly “disagree” and “strongly disagree” into one. So they are “Agree”, “Undecided” and “Disagree” .

### **Data Collection Procedure**

After taking achievement test, the researcher also visited the sample schools with questionnaire and guideline for interview schedule. Questionnaires were given to the 20 low achiever Ethnic students. The researcher explained and clarified any confusion that arose in understanding the questions. Also five low achiever students, five math teachers, two head teachers, and two parents were also interviewed. Schools documents like teachers profile, student's record, mark ledgers and related documents were also noted.

### **Data Analysis and Interpretation**

The data collected through questionnaire and interview were tabulated and analyzed descriptively with the help of mean weight. Similarly, the data collected through the interview were analyzed and interpreted descriptively.

## Chapter – IV

### ANALYSIS AND INTERPRETATION OF THE DATA

The collected data were classified, tabulated, analyzed according to the objective of the study and test the hypothesis of the study. The obtained data were statistically analyzed and interpretation by using t-test, mean weights and standard deviation. Also the data obtained were statistically analyzed and interpreted by using mean weight. The analysis of the data was based on the following heading.

#### Achievement Level of the Students

To determine the achievement level of grade IX students in mathematics, the collected questionnaire, interview data and mean and the standard deviation of the total sample were computed.

#### Achievement Level of the Ethnic Students in Mathematics

Number of Students	Mean	Standard deviation	Co-efficient of variation
60	13.70	4.64	29.92%

Above table showed that the mean achievement level of grade IX Ethnic students of Kathmandu district was 12.86. The mean achievement of Ethnic students was less than the average value. It showed that it was not satisfactory result. The standard deviation was 3.85 and the co-efficient of variation was 29.92%, which shows that there was less variability in grade IX student's achievement score in Kathmandu district.

#### Major Factors Affecting Mathematics Achievement of Ethnic Students

- Influence of home related factors in mathematics achievement.
- Influence of Student related factor in mathematics achievement.
- Influence of School related factor in mathematics achievement.

#### Influence of Home Related factors in Mathematics Achievement

Home related factor was found to be one of the main influencing factors in mathematics. This part deals with the home related factors that affect the students'

achievement .Learning environment at home, culture and tradition, economic condition parent's education and availability of study materials that directly affected the mathematics achievement have been taken as home related factors and influence of each of them have been analyzed.

### **Learning Environment at Home**

In the field of the study the environment of the family directly affected their education. In the respondent Ethnic family, there was no one educated. If anyone was educated then they were not in the village, they had gone out for job. In such an instance, who would help in their study? The researcher's observation showed that they were not interested in study simply because they did not get motivating environment for study at home.

About the third statement 90% of student agreed that their parents almost took care and concern about their study and remaining 10% of the students remained undecided. Therefore, the achievement in mathematics was directly influenced by the learning environment at home, i.e., the mean weight was only 2.58. About first statement, 15% of students agreed, 25% of students were undecided and 60% were disagreed that statement, guided by their parents, elder brother and sister. A mean weight 2.2 suggested that guided by parents, elder brother and sister to learn mathematics seemed to be one influencing factor. All students (100%) agreed that they had more work at home.

The head teacher and the math teachers claimed that environment at home must be peaceful for study and better performance in learning. Some of the students also held similar remarks. One of them said:

“My family is not supportive of studying. My father says that I should look after the sheep, while my mother asks me to help her at home. And I don't have time to go to school.”

Whereas parents believed that they wanted their children to study, but they could not help them go to school regularly because of household work. They also said that because of their illiteracy, they could not help in their study at home. As one parent commented:

“We don’t know ourselves, and how can we help them do maths?”

Thus, it was concluded that learning environment at home was one of the main factor which affected the students learning achievement and it was more so particularly in mathematics.

### **Mother Tongue**

About 2nd statement, 65% agreed that due to lack of instruction in mother tongue, it was difficult to understand math learning, 10% were undecided and 25% disagreed with that statement. Ethnic is the first language for Ethnic students but they are imposed to speak Nepali language in classrooms and while interacting with teachers and friends. So they feel difficulty to understand the problem. A mean weight 3.4 indicated that the mother tongue was one of the influencing factors in mathematics achievement.

From the researcher’s observation it was found that most of the parents speak in their mother tongue in their houses and the students were taught in either Nepali or in English in school. And thus, medium of instruction was seen to be one of the impediments of their learning achievement. However, the Head teacher and math teacher agreed to that statement partially and said that mother tongue more influenced at primary level, not for lower secondary and secondary level. The students also held the view that they did not understand properly when they were taught in Nepali language only. It showed that the students even at secondary level felt more comfortable with their mother tongue than other language as medium of instruction.

### **Parent’s Education**

About 8<sup>th</sup> statement, 50% of student agreed that most of the parents of Ethnic students were involved in trekking, business profession and farming which affected the study of children. While 15% remained undecided and 35% of student disagreed. A mean weight 3.1 showed that trekking and business profession of parents was also one of the influencing factors for student achievement of mathematics.

Most of the Ethnic were illiterate and they were not aware educationally. So they could not give attention to their children’s education. Also they were careless in making the good environment for study at home. They could not help their children in



their subject matter. It was also found that they were not aware about their children's education. Many of the Ethnic parents were engaged in trekking, business and farming. So they had no time to take care of their children's education.

In response to his parent's question of the effect of study, he said:

"I have no answer when my parents ask me the possibility of getting job after my study". (Student)

The above view showed that the Ethnic students were not sure for their future. Besides, they had to take up the job of their parents when they grew up. It was a part of their tradition.

Both the head teacher and the math teacher agreed that occupation of the parents were also the key factors for achievement of Ethnic students in mathematics. Thus, parent's education and occupation were directly related to the students' achievement in mathematics.

### **Analysis of the Response Given By the Parents**

Parents of the five low achiever students were not educated. In the interview the common response given by the parents were as follows:

"We do not have much wealth. We have to work, and so do our children. They go to collect firewood or grass in the morning and evening and they have little time at day time to go to school and study in spare time."

According to a male student's parent "What will they do after reading? Many educated are jobless. After S.L.C., I will send my son to join the trekker's group or overseas for work."

According to a female student's parent "they know how to read and write; why to read much for household work. After S.L.C. if we get right man for her we will marry them off."

## **Literacy of parents**

About 5<sup>th</sup> statement, 50% of students agreed, 35% remained undecided and 15% disagreed the statement about the effects of the literacy of parents on their mathematics achievement. A mean weight 3.5 suggested that literacy of parents was also one of the influencing factors in mathematics learning not only for Ethnic students but also for other students.

Most of the parents said they had to bear this back warded condition due to lack of their education. So they would educate their children anyhow so that their children would not have to suffer as they did. The head teacher and the math teacher pointed out that parents' awareness of the importance of education affected the mathematics achievement to a larger extent. One of the teachers said:

“If parents were literate somehow then they suggest their children to read mathematics regularly.”

This showed that parent's education or their awareness of the importance of education affected their children's education.

## **Household Workload**

About the 4<sup>th</sup> statement, 90% students agreed that they had work load at home and 10% were undecided about it. A mean weight of 1.6 suggested that household workload directly influenced the mathematics learning of their Children. To conduct the daily life they had to work in the field. Because of the household work load they were not involved in directly productive work, Ethnic female students had more workload at home than male ones. According to them they had to help their parents in cooking, washing clothes, cleaning pots, cutting grass, caring animals etc. Generally Ethnic male were also busy in collecting wood for cooking and grass for domestic animals.

“My sister cooked food and I used to go for grass in the morning”. (A male student)

The above view showed that Ethnic students should help their family for work. According to them they could not get enough time to practice on the

mathematics problem. Mathematics was hard subject for them so they needed enough time to practice. But they could not get time due to domestic work load. So their performance in mathematics was not good. Therefore, house hold workload was the main factor affecting their achievement in mathematics, including other subjects.

Whereas parents believed that they wanted to send their children to school but because of their household work, they could not send them to school.

### **Economic Condition**

Ethnic are one of the disadvantage groups. In Kathmandu, economics condition of most of the Ethnic family is very poor. The guardians are illiterate due to poverty. Due to poor economic condition they could not send their children to school regularly. When the parents were asked “how does economic status affect the children education?” the following answer came forth:

“Because of the weak economic condition, we could not afford for the good education for our children.” (Parent)

“It is difficult to pay fee on time and buy uniform on time , it disturbs their study.” (Parent)

“Anyhow I am trying to pay for good education for them.” (Parent)

From the above responses, we found that most of parents were poor. It was difficult for them to pay for the education of their children. The respondent parents expressed that they had to bear the poor condition due to illiteracy. So they said that they would educate their children at any cost.

Read the question given in the questinaire carefully and respond [ ] which you feel the best option .

Where,

S.A= “Strongly Agree”

A= “Agree”

U= “Undecided”

D.A= “Disagree” ,and

S.D.A= “Strongly Disagree”

Title."Factors Influence Achievement of Ethnic Students in Mathmematic"

S.N	STATEMENTS	SA	A	U	DA	SDA
	<b>Factors Related to Home</b>					
1	Parents almost take care and concern with my study.					
2	Due to the mother tongue of Sherpa, it is not difficult to understand mathematic learning.					
3	Parents, Sister and elder brother also guided me to learn in mathematic so it easy to study mathematic in a home.					
4	Due to house hold work it is not sufficient time to read.					
5	My Parents are not so much literate, so they donot pay attention tyo my study.					
6	Practicing mathematic exercise in home,time is sufficient.					
7	Some fafily members quarrel among them them time to time which affect the bad result in study.					
8	My Paresnt are involved in treaking and farmer profession which affect the study.					

**Influence of Student Related Factors in Mathematics Achievement**

This part deals with the student related factors that affect the students' achievement. Prior knowledge, gender, given time at home were found to have direct influence on mathematics achievement. And they have been taken as student related factors and influence of each of them have been analyzed hereunder.

**Favorite Subject**

About the 9<sup>th</sup> statement, 20% of respondents agreed with the statement that mathematics was favorite subject while 15% were undecided and the rest 65% disagreed about the statement "mathematics is my favorite subject from childhood". A mean weight 2.2 suggested that it influenced the achievement of Ethnic students in mathematics learning. Most of the students were of the opinion that they did not like

the subject because it was difficult, and they did not understand it. One of the students said:

It is my toughest subject, I don't like it. It takes more time for practice and I cannot do that because of household work.

However, some few students were very much interested in learning mathematics who also scored higher in achievement test. One student said that

“It is my favourite subject since childhood. I love doing maths. It is applicable in everyday life.”

Head teacher and mathematics teacher agreed that most of the students had fear, anxiety and felt difficult subject and left studying the subject.

The above discussion showed that only a few students (20%) who were keen in mathematics had higher achievement whereas those who did not take it as a favorite subject (65%) had poor performance in mathematics. Therefore, interest of students in mathematics became one of the influencing factors in mathematics achievement.

## **Gender**

About the 11<sup>th</sup> statement, 70% of students agreed, 10% were undecided and the rest 20% disagreed about the statement that gender was one of the variable which affected mathematics achievement. Both the math teacher and the head teacher agreed that boys achievement was better than that of girls in mathematics.

The mean weight 3.9 showed that gender was the influencing factor of mathematics achievement. So, mathematics achievement depended upon the gender difference, too.

From the researcher's observation also it was found that most of the girls did not have time to go to school, and even if they went to school, they had little time at home to practice it. Furthermore, the girl students also have to look after their small brother(s) and/or sister(s). Similarly, the CBS data (2011) also showed that the literacy rate of female is lesser than male ones.

The math teachers also said that girl students rarely complete their homework. They also did not come to class regularly and their achievement was always lesser than that of boy students.

### **Age of the Students**

Different age level of students was also the key factor for understanding mathematics. About the 14<sup>th</sup> statement, 65% respondents supported the statement, 10% remained undecided and 25% students disagreed with the statement that different age level of students was key factor for understanding mathematics. Also the mean weight 3.6 suggested that age of the level of the students played vital role in mathematics achievement.

The head teacher said that age level of the students was affecting their understanding of mathematics. The math teacher also had similar belief who said:

Relatively, age appropriate for class IX were better achievers than other age level students in the same class.

The parents stated that the school was far away from their houses, and so they could not send their small children to school. And when they were old enough to go to school on their own, they could not perform well. One of the parents accused their children for not passing the exams even though they were getting older. Whereas the students had different thing to say. They said that they felt uncomfortable going to the same class where there were many other students who were younger than them. It showed that most of the Ethnic students were overage for the standard grade studies, and hence they could not perform well.

### **Prior Knowledge**

Prior knowledge is the base for the further study. Learning process is always a stepwise process. If students have basic knowledge then s/he can easily learn the next step. Therefore, if student have prior knowledge of subject matter then teaching learning process runs smoothly.

About 16th statement, 60% agreed while 10% were undecided and 30% disagreed about the statement that prior knowledge directly affected the mathematics

achievement. A mean weight 3.3 suggested that the prior knowledge was one of the key factors affecting mathematics achievement.

The math teacher said, “Prior knowledge is an important potential determinant of performance in mathematics and other subjects too.”

### **Regularity in the Classes**

About 13<sup>th</sup> statement, 65% respondents agreed to the statement that they were always present in the mathematics class, while 35% disagreed. The mean weight 3.6 suggested that students should be more regular in class in order to achieve more in mathematics. In this respect, the math teacher said:

Some Ethnic students are not regular in class. They feel mathematics difficult and don't study it. They are not interested in mathematics. (Math teacher)

Most of the parents were poor and they could not send their children to school because they needed their children to help them in their work. Also most of the parents go to work out of home, and so the children should help their mothers at home. One of the mothers said:

I am alone at home because Furli's father goes to work for trekking, so Furli is the one who can help me at home to look after her little brother and help me prepare food. How can she go to school regularly then?

During the interview the head teacher said that some Ethnic students were irregular in class that made them difficult to pass mathematics. So, regularity in attending the class was revealed to have been one of the influencing factors of mathematics achievement.

### **No Consultation with Friends and Teachers**

About the 15<sup>th</sup> statement, 25% of respondent agreed, 25% were undecided and 50% disagreed with the statement that they consulted to friends and learned missed class subject matter from them if they missed the class. The mean weight 2.7 suggested that not consulting with friend was one factor for low achievement of Ethnic student in mathematics.

Similarly, about the 18<sup>th</sup> statement, 70% of the students agreed, 5% of the students were undecided and 25% disagreed with that statement. It showed that students were not interested in asking question to their teachers. So, it was also a main factor to have low achievement in mathematics of Ethnic students.

The math teacher and the head teacher agreed that students should consult with friends and teachers to learn something.

### **Study Mathematics**

About the 11<sup>th</sup> statement, 70 % of respondent students agreed, 10% were undecided and rest 20% disagreed to the statement that they spent 2-3 hours of the day for studying mathematics. The mean weight 3.9 suggested that average number of student spent that time on reading mathematics.

Again about the statement 17<sup>th</sup>, which stated that study of mathematics improved the intelligence level; hence they liked to learn mathematics. However, only 20% agreed to that statement, 15% were undecided and 65% disagreed. Even though mathematics being applicable, quite a less percentage of students agreed that mathematics improved the intelligence level. Also mean weight 2.3 suggested that students were not interested in learning mathematics.

During interview, the head teacher said, “Mathematics is base of all fields. So we give more emphasis on mathematics learning.” Also mathematics teacher added, “If the students spent more time to practice mathematics, mathematics achievement would be high and result would be better.”

### **Mathematics is Applicable**

On the 20<sup>th</sup> statement, 30% of students agreed that they did hard labor in mathematics because it was applicable in all sectors. 15% of students were undecided about the applicability of mathematics and remaining 55% disagreed to that statement. A mean weight of this statement was 2.5 which suggested that hard labour in mathematics directly affected the achievement of Ethnic student in mathematics. It showed that most of the students were unknown about the applicability of mathematics, therefore, they did not pay much attention to studying mathematics. However, the head teacher and the math teacher agreed that mathematics was the



most applicable subject but they were not able to make the students understand its application in day to day life. Therefore, the students were not performing well in mathematics even though the subject was very applicable in almost every field.

### **Practice of Previously Learned Subject Matters**

About the 21<sup>st</sup> statement, 15% students supported, only 20% students remained undecided and the rest 65% students disagreed with the statement “I used to practice previously completed exercise time to time”. A mean weight 2.2 suggested that practice of previously learned subject matters in mathematics improved the intelligence level hence it directly influenced the achievement.

Students were not practicing previously learned subject matter time to time so they forgot the subject matters. (Head teacher)

Read the question given in the questionnaire carefully and respond [ ] which you feel the best option .

Where,

S.A= “Strongly Agree”

A= “Agree”

U= “Undecided”

D.A= “Disagree” ,and

S.D.A= “Strongly Disagree”

Title."Factors Influence Achievement of Ethnic Students in Mathematic"

S.N	STATEMENTS	SA	A	U	DA	SDA
	Factor related to students					
1	Mathematic is my favorite subject form childhood.					
2	During the study almost 2-3 hours time spend for the study of mathemaics.					
3	Does gender has been one variable that influence mathematic acheivement ?					
4	I always asked problems to the mathematics teacher with out any hesitation.					
5	I always present in the mathemaic class.					
6	Different age levels of student's are also key factors for understanding mathematics.					
7	I consult to my friends about missed classes's subject matter and other too.					
8	Study of mathemaic improves the intelligence level hence I like to learning matemaics.					
9	Prior knowledge directly affecting mathematic achievement.					
10	Each and every problems of mathematic takes time to solve it hence I do not like to solve the problems.					
11	A part from class time first use to learn mathemaic with the teacher.					
12	I do hard labour in mathematic because it is applicable in all sectors.					
13	I use to practice previuosly completed exercise time to time					

**Analysis of the Influence of School Related Factors in Mathematics Achievement**

This part of the analysis deals with the school related factors that affect the student's achievement .Learning environment at school, teachers attitude, qualification of teachers, teaching experiences and ability of the teachers, class size,

location of the school, types of instructional materials used directly affect the mathematics achievement and these factors have been taken as home related factors and the influence of each of them have been analyzed.

### **Environment of School**

Environment plays a vital role in teaching learning process. If school is in peaceful place then environment of school is good and students are interested to learn. On the 24<sup>th</sup> statement 30% students supported 30% students remained undecided, whereas 40% students disagreed. A mean weight 2.4 suggested that poor school environment directly affected the high achievement in mathematics.

From the researcher's observation the outer environment of the schools was peaceful, however, interaction between teachers and students, training and workshops to the teachers, use of teaching materials, regularity of teachers, and extra-curricular activities were not found to be effective. Consequently, students' achievement in mathematics had been affected by the lack of dedicated teachers, unavailability and/or no use of teaching materials, lack of extra-curricular activities and weak teachers-parents relationship.

### **Desk, Benches and Blackboard**

About 22<sup>nd</sup> statement, 70% of students agreed, 15% were undecided and 15% disagreed to the statement that there was no good facility in desk and benches. The mean weight 1.4 suggested that good facility for sitting in the classroom directly affected for mathematics achievement of Ethnic students.

Also, Black-board is an essential thing which should be appropriate in size and place. On 23<sup>rd</sup> statement, size of the blackboard was an appropriate in the basis of class size. Only 20% of students agreed while 25% remained undecided and remaining 55% disagreed with that statement. The mean weight 2.4 was less than average weight. So it suggested that blackboard was also the key factor of mathematics achievement, not only for Ethnic students. The head teacher said that:

Appropriate size of classroom, blackboard and availability of desk benches directly affect the students' achievement in mathematics as well as other subjects. Here in our school we do not have enough classrooms, desk and benches, etc, for

accommodating the increasing number of students day by day. Rather, we do not have any sources of income for adjusting those students. (Head teacher)

Hence facilities of proper classroom, black board, desk and benches were not found in the school, which were found to have an adverse impact on students' overall learning including achievement in mathematics.

### **Qualification and Experience of Teacher**

About 25<sup>th</sup> statement, 75% students agreed to the statement that mathematics teacher along with other teachers should have higher education. 15% were undecided and 10% disagreed with the statement. A mean weight 3.9 suggested that qualification of teacher was one of the influencing factors for mathematics achievement.

On 30<sup>th</sup> statement, the entire mathematics teachers from primary level to secondary level were trained. 60% of respondent supported that statement, 15% remained undecided and the rest 25% disagreed with that statement. A mean weight 3.4 suggested that training of teacher was also the affecting factor in mathematics achievement of Ethnic students and other students alike. The head teacher said:

Almost all math teachers are trained as well as have higher education and are experienced. But we have not been able to provide them with sufficient teaching materials, and even if we have some, our teachers are not in the habit of using them so often.

The discussion of qualification and experience of the teachers showed that theoretically there should have been good achievement in the students but practically that was not found because the teachers were not found to be dedicated. As one parent said:

The teachers were simply taking the classes to take the salary. There were no extra classes for under achievers.

Similarly, they were not able to motivate students to studying mathematics. They were found not to be using even the available materials like geo-board, cone, cylinder, etc. This was further supported by one math teacher who said:

Though we are qualified and experienced, we are not able to run the classes in full fledge as most students are irregular. When students are absent, we do not feel like teaching. And when this happens, there is always low achievement in mathematics.

This showed that there were qualified and experienced teachers, however, student's achievement in mathematics was low.

### **Teacher Biasness**

In the statement 25<sup>th</sup>, 'teacher biases any race of students during the teaching of mathematics. 75% of student agreed, 15% were undecided and 10% students did not support the statement. A mean weight 3.9 suggested that biasness of teacher towards the different caste students directly influenced the achievement in mathematics.

During the interview some teachers disagreed that they biased any races of students during teaching and other time also. They also added, Brahamin and Chhetri students asked question frequently in class. So at that situation, it was assumed that the teacher was centred with Brahamin and Chhetri students only.

The head teacher said, "all the teachers in this school are co-operative and helpful and it has made the entire school a single family. So the behavior of teacher towards students and staff is satisfactory and appreciable and there is no any biasness to any caste."

### **Analysis of the Response Given By the Math Teachers**

Mathematics teachers were qualified, trained and experienced .In the interview the common response given by the math teachers was as follows. :

We in classroom are appearing in child oriented environment and we hope that we have fulfilled the basic requirements of teaching. For example, students feel good, interacting with teacher and students during studying. Also we are trying to present as many as possible teaching materials per the subject matter that help us to keep our learning in memory for a long time.

## **Teachers' Special Care**

On the 32<sup>nd</sup> statement, 20% of student supported the statement. 40% students remained undecided and the rest 60% disagreed to the statement that mathematics teacher should take care especially Ethnic students. A mean weight 2.2 which was less than average weight suggested that mathematics teacher did not provide special care the Ethnic students.

“Mathematics teacher not only care and concern the Ethnic students but also care and concern others too.

## **Analysis of the Response Given By the Head Teachers**

Most of the Head-teachers were qualified, trained and experienced (Appendix-H). All of the head teachers were of education background. Though not mentioned in the table, each of the head teachers was assuming the role of principal ship for no less than 5 years. Hence they were all very experienced. In the interview the common response given by the Head teachers can be concluded as:

We will give equal rights, opportunities and facilities as far as possible from our side to all the students. We will not differentiate students on any basis, may it be on race, caste, ethnicity, or any socio-economic backgrounds. We simply see students as students. Not only in the case of mathematics teacher but also other subject teachers are trained, educated and experienced. In their eyes, every student is equal, every student deserves the same treatment.

## **Facility of Play Ground and Playing Materials**

On the 34th statement, which stated that good facility of play ground and playing materials would affect mathematics achievement, 30% of respondents agreed, 15% remained undecided and 55% disagreed. The mean weight 2.5 suggested that there was not good facility of play ground and playing materials.

Head teacher stated that “we have good facility of ground but not enough playing materials. But still we have managed some materials which are somehow helpful for the students to perform their extra activities.”

This showed that there was no sufficient playing materials, which had an adverse effect on students overall learning.

### **Teaching Materials**

On the 31st statement, ‘teacher used teaching material in the mathematics class’ 25% student supported, 20% students were undecided and 55% students disagreed. A weight 2.6 suggested that the use the teaching materials while teaching mathematics by the teacher directly influenced in achievement of Ethnic students in mathematics.

The researcher’s observation showed that there was no or less use of teaching materials in the classroom. Similarly, during the interview, two math teachers said that they lacked teaching materials in their schools. The head teacher also accepted that they could not manage teaching materials due to economic reasons.

Hence, the availability and use of teaching materials became a great affecting factor in mathematics achievement of the students.

### **Extra Classes**

In the statement ‘for Ethnic students school provided extra classes’ no one supported this statement, 100% disagreed. A mean weight 1.00 suggested that the extra classes for Ethnic students weren’t provided by school. So it was an affecting factor in mathematics achievement.

Read the question given in the questinaire carefully and respond [ ] which you feel the best option .

Where,

S.A= “Strongly Agree”

A= “Agree”

U= “Undecided”

D.A= “Disagree” ,and

S.D.A= “Strongly Disagree”

Title."Factors Influence Achievement of Ethnic Students in Mathematics"

S.N	STATEMENTS	SA	A	U	DA	SDA
	Factor related to School					
1	There is no good facilities for sitting in a desk and bench.					
2	Size of the blackboard is appropriate on the basis of class size.					
3	The school is situated in the peace ful environment hence it helps in studying.					
4	Mathematics teacher alone with other subject's teacher got the higher education.					
5	During the teaching of mathematics, teacher is centered only with Brahmin and Chhetri students.					
6	Teacher biases the all races of students during the teaching of mathematics.					
7	Learning of mathematic by attraction with the teachers boosted up for long time memory.					
8	School is far away from the unnecessary noise and crowding studying environment is quite good.					
9	The entire mathematic teachers from primary level to secondary levels are trained.					
10	Teachers uses the cheape , attractive and suitable teaching materials while teaching mathematics.					
11	Mathematics teacher take care the students especially sherpa students.					
12	For ethnic student's school provided extra classes.					
13	There is good facility of ground and playing materials.					



## Chapter – V

### SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

After analyzing and interpreting the data, the researcher has tried to summarize, draw findings, and derive conclusions and recommendations for further study. The first section of this chapter presents the summary of the whole research, the second section reveals the findings of the study, similarly, the third section presents the conclusions and the last section presents some recommendations derived from the findings of the study.

#### Summary

This study was on the title of "Factors affecting mathematics achievement of Ethnic students". The main concern of this study was to find the factors that affects the mathematics achievement of Ethnic Students at grade IX. The major tools used for this study were interview, questionnaire test.

This was a mixed research. To fulfill the objectives of the study, the researcher purposively selected five public secondary schools of Kathmandu district. In total, 60 Ethnic students from five schools were taken as sample students. An achievement test paper was prepared with the help of specification grid, curriculum and text book. The pilot study was administrated to establish the reliability and validity of test paper. After that the achievement test was administrated to the sampled students by the researcher himself. .

Study found that mean achievement of Ethnic students was 13.70. The mean difference of two groups Ethnic and Other students was 3.6. It was found that the achievement of other students were higher than the achievement of Ethnic students. Prior knowledge, favorite subject, regularity in math class, consultation with friends and teachers, environment of school, qualification and experience of the subject teachers, parent's education and occupation, family environment, household work load, lack of motivation are the major factors affecting the mathematics achievement of Ethnic students.

## **Major Findings of the Study**

This study aims to find the factors affecting the achievement of Ethnic students in mathematics of Kathmandu district. The researcher finding of the study was:

### **Findings Based on Home Related Factors**

- Parents, sister and elder brother did not guide to learn in mathematics so it was not easy to study math at home.
- Due to lack of instruction in mother tongue, it was difficult to understand math.
- Most of the parent's occupation affected the study of their children.
- Parent's literacy and educational background directly influenced their child's achievement in mathematics.
- The Ethnic students did not get opportunity to learn mathematics at home.
- The students could not afford for tuition classes to improve in mathematics.
- Mathematics achievement very much depended upon gender difference.
- Prior knowledge was the basis for the further study in mathematics, the students having the prior knowledge of subject matters were better at learning mathematics.
- Amount of time given to study mathematics directly affected the achievement in mathematics.
- Regularity in attending classes influenced the achievement in mathematics. Consulting with the friends and teachers to learn the missed classes subject matter directly influenced the achievement in mathematics.
- Time to time practice of previously learned subject matters in mathematics improved the intelligence level hence it directly influenced the achievement in mathematics.
- Each and every problem of mathematics took time to solve it hence students did not seem to be interested in doing maths.
- Peaceful environment of school directly influenced in better achievement.
- Higher education of the subject teacher directly influenced achievement of students in mathematics.

- The entire mathematics teachers from primary level to secondary level were trained.
- Almost all the mathematics teachers were found qualified and experienced.
- Extra classes for backward students weren't provided by school.
- Care of students by maths teachers influenced the achievement in mathematics.
- They did not get encouragement and motivation at home and school.
- Ethnic students and their teachers relation did not seem to be dependable and co-operative to each other.

## **Conclusion**

The present study "A Study on factors affecting mathematics achievement of Ethnic students in Kathmandu district" analyzed the level of achievement of Ethnic students in Kathmandu district and explored the affecting factors that determine the achievement of Ethnic students of grade IX. The major tools used for this study were interview, questionnaire and achievement test. This study found the following key influencing factors in mathematics achievement of the Ethnic students.

There was low achievement of Ethnic students in Kathmandu district. There was a significant difference between the mean achievement score of Ethnic and Other students in mathematics in Kathmandu district. The Ethnic students were not getting motivation from their parents and teachers to learn mathematics. Even though the teachers were well trained, experienced and qualified, the students' achievement in mathematics was not satisfactory. Student's achievement was affected by some school related factors like school environment, facilities and extra-curricular activities. There was no special provision of extra classes for mathematics, though the students were poor in mathematics.

Based on the findings, it can be deduced that if proper attention was paid from all the concerned stakeholders, including parents, teachers and school management committee, the achievement of mathematics by Ethnic community could be enhanced.

## Recommendations

The findings of the study are valid for Ethnic students of Kathmandu district and may not be generalized to the students of other districts of the kingdom. Also finding of this study cannot be generalized to the entire grade and level of school because of it is limited to grade IX of secondary level students. On the basis of finding and conclusion provided by the study, the following recommendations are made for improving the Ethnic students' achievement in mathematics:

- They should be motivated to be regular in class, regular student should be awarded.
- Necessary educational material should be provided.
- There should be interaction between their parents and teachers.
- They should be motivated from their parents and teachers.
- Appropriate environment should be provided.
- It is seen that training and orientation is necessary for math teacher in order to manage multi-ethnic or diverse classroom.
- Educational program should be organized to enhance the capacity of math teacher to identify the necessity and learning capacity of multicultural students in math class.
- Language is not the major issues of mathematics learning rather it is to be used to convey the information where students feel difficulty and should give the flexibility in using the language as per the easiness of the community.
- The curriculum of mathematics should be made relevant to the everyday need of multi ethnic students.
- They should be afforded for tuition and extra classes to improve in mathematics.
- In the school, Ethnic students should be given special attention.
- This study is done within the limitation and particular area. A broad and general study may be done for overall Ethnic community.
- As there are very limited number of this kind of researches in Nepal and therefore it is recommended that the concern authority can conduct and apply enough of similar researches to make the curriculum effective.
- Special remedial package should be provided to Ethnic students to boost up their achievement.

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## Appendix-A ITEM ANALYSIS CHART

Students	Upper Right 27%								Lower Right 27%								P %	D	Remark
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8			
1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	93.75	0.12	Cancelled
2	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	68.75	0.62	Acceptable
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	0	Cancelled
4	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	37.5	0.75	Acceptable
5	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	0	68.75	0.37	Acceptable
6	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	31.25	0.62	Acceptable
7	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	68.75	0.37	Acceptable
8	0	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	62.5	0.5	Acceptable
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	87.5	0.25	Acceptable
10	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	68.75	0.62	Acceptable
11	1	1	1	0	1	1	1	1	1	0	1	0	0	0	0	0	56.25	0.75	Acceptable
12	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	25	0.25	Modified
13	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1	68.75	0.37	Acceptable
14	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	75	0.5	Acceptable
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	0	Cancelled
16	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	81.25	0.37	Acceptable
17	1	1	1	1	0	1	0	0	0	1	0	0	0	1	0	0	43.75	0.37	Acceptable
18	1	0	1	1	1	1	1	1	1	0	0	1	0	0	1	0	0.5	0.62	Acceptable
19	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	18.75	-0.12	Cancelled
20	0	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	75	0.25	Modified
21	1	1	1	0	1	1	1	1	1	0	1	0	0	0	0	0	56.25	0.75	Acceptable
22	1	1	1	0	1	1	1	1	1	0	1	0	0	0	0	0	56.25	0.75	Acceptable
23	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	81.25	0.37	Acceptable
24	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	75	0.5	Acceptable
25	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	68.75	0.62	Acceptable
26	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	81.25	-0.37	Cancelled
27	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	81.25	0.37	Acceptable
28	1	0	1	1	1	1	1	1	1	0	0	1	0	0	1	0	0.5	0.62	Acceptable
29	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	93.75	-0.12	Cancelled
30	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	81.25	0.37	Acceptable
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	0	Cancelled
32	1	0	1	1	1	1	1	1	1	0	1	1	0	1	0	0	68.75	0.37	Acceptable
33	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	87.5	0.25	Modified
34	0	0	1	1	1	1	1	1	1	0	0	0	0	1	1	1	50	0.5	Acceptable
35	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	81.25	-0.12	Cancelled
36	0	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	75	0.25	Cancelled
37	0	1	1	0	1	1	1	1	0	1	1	0	0	0	0	0	43.75	0.37	Acceptable
38	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	93.75	0.12	Cancelled
39	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	81.25	0.37	Acceptable
40	1	1	1	0	1	1	1	1	1	0	1	0	0	0	0	0	56.25	0.75	Acceptable
41	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	81.25	0.12	Cancelled



**Appendix – B**  
**QUESTIONNAIRE**

Dear students,

I am Pitambar Sigdel, a student of Master Degree in Mathematics Education from T.U., Kirtipur. I am going to conduct a research thesis entitled "Factor affecting mathematics achievement of Sherpa students in Kaski District", for the partial fulfillment of Master Degree in Mathematics Education, with the objectives:

- ) To analyze the level of achievement of Sherpa
- ) To explore the affecting factors that determines achievement of Sherpa students in mathematics.

So, to complete this thesis, I have prepared some questionnaire to collect some valuable information from you. The researcher is very much thankful for your valuable help and would like to express gratitude to you and your institution. The information obtained from you will be used for this study and your answer will be kept secret. I request you to fill this questionnaire as follows:

- ) Please read carefully and respond as you feel.
- ) You are requested complete all the questionnaire items, i.e., do not to leave any question blank and unanswered.
- ) If you do not understand any question in the questionnaire please ask those questions to the researcher for clarification.

**STUDENTS' BIO-DATA FORM**

Name of the student .....

Gender:    Male                        Female                   

Name of school .....

Father's education .....

Occupation of you father .....

Mother's education .....

Occupation of your mother .....

Total members in the family .....

## Appendix – C

### GUIDELINE FOR INTERVIEW WITH MATHS-TEACHER

Name : sex :  
Qualification: Ethnicity:  
Training: Religion:  
Experience:

The interview with mathematics teacher will be taken on the basis of the following main topics:

- ) Encouragement the students in learning
- ) Expectation for learning mathematics
- ) Monitoring progress
- ) Reinforcement provided by the teacher
- ) Teacher-student interaction
- ) Teacher-parents interaction
- ) Types of assessment used

### Guideline for Interview with Head-Teacher

Name: Gender:  
Qualification: Ethnicity:  
Training: Religion:  
Experience as a principle:  
Experience as a teacher:

The interview with Head teacher will be taken on the basis of the following main topics:

- ) Professional development of math teacher
- ) Learning environment in the school
- ) Communication between parents and teacher
- ) Guidance for mathematics teacher
- ) Instructional leadership
- ) Student opportunity for learning with teacher

### Guideline for Interview with Sherpa Students

Name : Class :  
Sex : School :

The interview with student will be taken on the basis of the following mach topics

- Study environment at home
- Given time to learn mathematics by elder brother or sister
- Parents education
- Culture or tradition
- Occupation of parents

## Appendix – D

### Title: "Factors Influencing Achievement of Ethnic Students in Mathematics"

S.N	STATEMENTS	SA	A	U	DA	SDA	Mean Wight
<b>Factors Related to Home</b>							
1	Parents almost take care and concern with their study.	1	2	5	9	3	2.5
2	Due to the mother tongue of Sherpa, it is not difficult to understand mathematics learning.	5	8	2	0	5	2.5
3	Parents, sister and elder brother also guided to learn in mathematics so it is easy to study mathematics in a home.	1	4	2	4	9	2.2
4	Due to household work, it is not sufficient time to read	10	8	2	0	0	1.7
5	My parents are not so much literate, so they don't pay attention to my study.	4	6	7	1	2	3.5
6	Practicing mathematics exercise in home time is sufficient.	2	5	6	3	4	2.9
7	Some family members quarrel among them time to time which affect the bad result in study.	1	2	8	5	4	2.5
8	My parents are involved in trekking and farmer profession which affects the study.	2	8	3	6	1	3.1
<b>Factors Related to student</b>							
9	Mathematics is my favorite subject from childhood.	1	3	3	6	7	2.2
10	During the study almost 2-3 hours time spent for the study of mathematics.	4	4	6	4	2	3.2
11	Does gender has been one variable that influence mathematics achievement?	9	5	2	3	1	3.9
12	I always asked problems to the mathematics teacher without any hesitation.	2	5	0	9	4	2.6
13	I always present in the mathematics class.	7	6	0	4	3	3.6
14	Different age levels of students' are also key factor for understanding mathematics.	5	8	2	3	2	3.6
15	I consult to the friends and learn the missed classes' subject matter from them if missed the classes.	1	4	5	2	8	2.7
16	Prior knowledge directly affecting mathematics achievement	3	9	2	3	3	3.3
17	Study of mathematics improves the intelligence level hence I like to learning mathematics.	2	2	3	6	7	2.3
18	Each and every problem of mathematics takes time to solve it hence I don't like to solve the problems.	4	10	1	3	2	3.5
19	Apart from class time I use to learn mathematics with the teacher.	1	4	7	6	2	2.7
20	I do hard labored in mathematics because it is applicable in all sectors.	2	4	3	4	7	2.5
21	I used to practice previously completed exercise time to time.	0	3	4	8	5	2.2
<b>Factors Related to School</b>							
22	There is no good facility for sitting in a desk and benches.	4	10	3	3	0	1.4
23	Size of the black-board is appropriate on the basis of class size.	0	4	5	8	2	2.4
24	The school is situated in the peaceful environment hence it helps in studying.	2	4	6	2	6	2.4
25	Mathematics teacher along with other subject's teacher got the higher education.	6	9	3	1	1	3.9
26	During the teaching of mathematics, teacher is centred only with Brahamaan and Chhettri students.	1	2	4	5	9	2.2
27	Teacher biases the all races of students during the teaching of mathematics.	2	3	5	7	3	2.7
28	Learning of mathematics by interaction with the teachers boosted up for long time memory.	4	7	4	3	2	3.4
29	School is far away from the unnecessary noise and crowding studying environment is quite good.	5	8	0	4	3	3.4
30	The entire mathematics teachers from primary level to secondary level are trained.	4	8	3	2	3	3.4
31	Teacher uses the cheap, attractive and suitable teaching materials while teaching mathematics.	1	4	4	8	3	2.6
32	Mathematics teacher take cares the students especially Sherpa students	0	4	8	2	6	2.2
33	For Ethnic Studentsschool provided extra classes	0	0	0	12	8	1.5
34	There is good facility of ground and playing materials	2	4	3	5	6	2.5

## Appendix – D1

### Title: "Factors Influencing Achievement of Ethnic Students in Mathematics"

S. N	STATEMENTS	A	U	DA
<b>Factors Related to Home</b>				
1	Parents almost take care and concern with their study.	45%	40%	15%
2	Due to the mother tongue of Sherpa, it is not difficult to understand mathematics learning.	65%	10%	25%
3	Parents, sister and elder brother also guided to learn in mathematics so it is easy to study mathematics in a home.	80%	10%	0%
4	Due to household work, it is not sufficient time to read	50%	80%	5%
5	My parents are not so much literate, so they don't pay attention to my study.	50%	35%	15%
6	Practicing mathematics exercise in home time is sufficient.	35%	30%	35%
7	Some family members quarrel among them time to time which affect the bad result in study.	15%	40%	45%
8	My parents are involved in trekking and farmer profession which affects the study.	50%	15%	35%
<b>Factors Related to student</b>				
9	Mathematics is my favorite subject from childhood.	20%	15%	65%
10	During the study almost 2-3 hours time spent for the study of mathematics.	40%	30%	30%
11	Does gender has been one variable that influence mathematics achievement?	70%	10%	20%
12	I always asked problems to the mathematics teacher without any hesitation.	35%	0%	75%
13	I always present in the mathematics class.	65%	0%	35%
14	Different age levels of students' are also key factor for understanding mathematics.	65%	10%	25%
15	I consult to the friends and learn the missed classes' subject matter from them if missed the classes.	25%	25%	50%
16	Prior knowledge directly affecting mathematics achievement	60%	10%	30%
17	Study of mathematics improves the intelligence level hence I like to learning mathematics.	20%	15%	65%
18	Each and every problem of mathematics takes time to solve it hence I don't like to solve the problems.	70%	5%	25%
19	Apart from class time I use to learn mathematics with the teacher.	25%	35%	40%
20	I do hard labored in mathematics because it is applicable in all sectors.	30%	15%	55%
21	I used to practice previously completed exercise time to time.	15%	20%	65%
<b>Factors Related to School</b>				
22	There is no good facility for sitting in a desk and benches.	70%	15%	15%
23	Size of the black-board is appropriate on the basis of class size.	20%	25%	50%
24	The school is situated in the peaceful environment hence it helps in studying.	30%	30%	50%
25	Mathematics teacher along with other subject's teacher got the higher education.	50%	10%	40%
26	During the teaching of mathematics, teacher is centered only with Brahman and Chhettri students.	15%	20%	70%
27	Teacher biases the all races of students during the teaching of mathematics.	25%	25%	50%
28	Learning of mathematics by interaction with the teachers boosted up for long time memory.	55%	20%	25%
29	School is far away from the unnecessary noise and crowding studying environment is quite good.	65%	0%	35%
30	The entire mathematics teachers from primary level to secondary level are trained.	20%	60%	25%
31	Teacher uses the cheap, attractive and suitable teaching materials while teaching mathematics.	5%	20%	75%
32	Mathematics teacher take cares the students especially Sherpa students	20%	40%	40%
33	For Ethnic Students school provided extra classes	0%	0%	100%
34	There is good facility of ground and playing materials	20%	15%	65%

**Appendix – E**  
**SAMPLE SCHOOLS**

<b>S.N.</b>	<b>SCHOOLS NAME</b>	<b>LOCATED PLACE</b>
1.	Shree Gaurishankar Higher Secondary School, Sitapaila, Kathmandu	Sitapaila, Kathmandu
2.	Shree Himalayai Higher Secondary School, Kalimati, Kathmandu	Kalimati, Kathmandu
3.	Shree Himalaya Secondary School, Seto Ghumba, Kathmandu	Seto Ghumba, Kathmandu
4.	Kalika higher secondary School, Kalanki, Kathmandu	Kalanki, Kathmandu
5.	Kalinag Higher Secondary School, Kalimati, Kathmandu	Kalimati, Kathmandu

**Appendix – F**  
**SAMPLE MATH-TEACHERS**

<b>S.N.</b>	<b>Teacher's Name</b>	<b>Qualification</b>	<b>Experience</b>	<b>School's Name</b>
1.	Upendra Yadhav	B.Ed.	1 yr	Shree Gaurishankar Higher Secondary School, Sitapaila, Kathmandu
2.	Kul Bdr Bhattarai	B.A, B.Ed.	12 yrs	Shree Himalayai Higher Secondary School, Kalimati, Kathmandu
3.	Dhurba pd. Khanal	B.Sc, B.Ed.	13 yrs	Shree Himalaya Secondary School, Seto Ghumba, Kathmandu
4.	Bimal Ghimire	M.Sc,	2 yrs	Kalika higher secondary School, Kalanki, Kathmandu
5.	Dipak Nepal	M .Ed.	6 yrs	Kalinag Higher Secondary School, Kalimati, Kathmandu

**Appendix – G**  
**SAMPLE HEAD-TEACHERS**

<b>S.N.</b>	<b>Head Teacher's Name</b>	<b>Qualification</b>	<b>School's Name</b>
1.	Govinda Pd. Barakoti	M.Ed.	Shree Gaurishankar Higher Secondary School, Sitapaila, Kathmandu
2.	Chuda Bdr. Thapa	M.A.,B.Ed.	Shree Himalayai Higher Secondary School, Kalimati, Kathmandu
3.	Biswa Bajrachrya	B.Ed.	Shree Himalaya Secondary School, Seto Ghumba, Kathmandu
4.	Sher Bahadur Puri	M. A. , B.Ed	Kalika higher secondary School, Kalanki, Kathmandu
5.	Rambahadur Shiwakoti	B.Ed.	Kalinag Higher Secondary School,Kalimati, Kathmandu