

**PROMOTING THANGMI STUDENTS IN LEARNING
MATHEMATICS AT BASIC LEVEL**

A

THESIS

BY

SANTOSH DAHAL

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR
THE DEGREE OF MASTERS OF EDUCATION**

SUBMITTED TO

DEPARTMENT OF MATHEMATICS EDUCATION

CENTRAL DEPARTMENT OF EDUCATION

UNIVERSITY CAMPUS, KIRTIPUR

TRIBHUVAN UNIVERSITY

KIRTIPUR, KATHMANDU

JUNE, 2022



त्रिभुवन विश्वविद्यालय
शिक्षा शास्त्र केन्द्रीय विभाग
गणित शिक्षा विभाग

विश्वविद्यालय क्याम्पस
कीर्तिपुर, काठमाडौं, नेपाल

UNIVERSITY CAMPUS
Kirtipur, Kathmandu, Nepal

TRIBHUVAN UNIVERSITY
CENTRAL DEPARTMENT OF EDUCATION

DEPARTMENT OF MATHEMATICS EDUCATION

पत्र संख्या:-
Ref.

मिति:
Date:

LETTER OF CERTIFICATE

This is to certify that **Mr. Santosh Dahal**, student of the academic year **2073/075** with campus Roll No: **652**, Exam Roll No: **7328449** and T.U. Registration No: **9-2-409-45-2011** has completed his thesis under the supervision of **Mr. Krishna Prashad Bhatt** during the period prescribed by the rules and regulations of Tribhuvan University, Nepal. The thesis entitled **Promoting Thangmi Students in learning Mathematics at Basic Level** has been prepared based on the results of his investigation conducted during the period of January 2022 to June 2022 under the Department of Mathematics Education, University Campus, Tribhuvan University, Kirtipur, Kathmandu. His thesis number is **1749** I recommend and forward his thesis for evaluation as the partial requirements to award the Degree of Master of Education.

.....

Prof. Dr. Bed Raj Acharya

Date:-15 June 2022



त्रिभुवन विश्वविद्यालय
शिक्षा शास्त्र केन्द्रीय विभाग

विश्वविद्यालय क्याम्पस
कीर्तिपुर, काठमाडौं, नेपाल

गणित शिक्षा विभाग

UNIVERSITY CAMPUS
Kirtipur, Kathmandu, Nepal

TRIBHUVAN UNIVERSITY
CENTRAL DEPARTMENT OF EDUCATION
DEPARTMENT OF MATHEMATICS EDUCATION

पत्र संख्या:-
Ref.

मिति:
Date:

LETTER OF APPROVAL

This thesis entitled "**Promoting Thangmi Students in Learning Mathematics at Basic Level**" submitted by **Mr. Santosh Dahal**, in partial fulfillment of the requirement for the Master's Degree in Mathematics Education has been approved.

Viva-Voce Committee

Signatures

Prof. Dr. Bed Raj Acharya
(Chairman)

.....

Prof. Dr. Binod Prasad Dhakal
Supervisor)

.....(External

Mr. Krishna Prashad Bhatt
(Supervisor)

.....

Date:-30 June 2022



त्रिभुवन विश्वविद्यालय
शिक्षा शास्त्र केन्द्रीय विभाग
गणित शिक्षा विभाग

विश्वविद्यालय क्याम्पस
कीर्तिपुर, काठमाडौं, नेपाल

UNIVERSITY CAMPUS
Kirtipur, Kathmandu, Nepal

TRIBHUVAN UNIVERSITY
CENTRAL DEPARTMENT OF EDUCATION
DEPARTMENT OF MATHEMATICS EDUCATION

पत्र संख्या:-
Ref.

मिति:
Date:

RECOMMENDATION FOR ACCEPTANCE

This is to certify that **Mr. Santosh Dahal**, has completed his M.Ed. thesis entitled “**Promoting Thangmi Students in Learning Mathematics at Basic Level**” under my supervision during the period prescribed by the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. The study embodies the result of an investigation conducted during the period 2021-2022 under the Department of Mathematics Education, University Campus, Tribhuvan University, Kirtipur, and Kathmandu. I recommend and forward his thesis to the Department of Mathematics Education for the final viva-voice.

.....
Mr. Krishna Prashad Bhatt
Supervisor

Date:- 15 June 2022

© 2022

Copyright by Santosh Dahal

This document is copyright material. Under the law, no parts of this document may be reproduced without the expressed permission of the researcher.

All Right Reserved

DEDICATION

This work is heartily dedicated to my respected parents , teacher and all family members whose support, love, care, and sacrifices made me the person I am now.

DECLARATION

This thesis does not contain any other work which is offensive and beyond the copy write norms. To the best of my knowledge and beliefs, this research is truly based on my effort and it does not match with any researches that were published earlier in any institutions. I take all the ethical and legal responsibility for submitting this thesis.

.....

Santosh Dahal

Date:

ACKNOWLEDGEMENTS

I am highly indebted to my respected **Mr. Krishna Prashad Bhatt**, Reader, Department of Mathematics Education, T.U. Kirtipur. His constructive and valuable suggestions, instruction, and scholarly guidance have become the greatest property of this research work. I have no impressive words to express my deep gratitude to him for his kind help.

My sincere appreciation goes to **Prof. Dr. Bed Raj Acharya**, Head, Department of Mathematics Education, T.U., Kirtipur, for his suggestions, support, inspiration, and encouragement to complete this work. At the same time, I wish to express my gratitude to all Lecturers and the respected teaching staff of the Department of Mathematics Education, T.U., Kirtipur for their valuable remarks, stimulation, and encouragement to complete the study.

Especially, I am very much grateful to the all-sample schools' family of Dolakha district for their kind co-operation and for providing an opportunity for the collection of data. I am also thankful to my friend and colleagues for their cooperation and help in the completion of this work.

Finally, I am grateful to my family members for their inspiration and assistance throughout my study.

.....

Santosh Dahal

ABSTRACT

This study entitled on “**Promoting Thangmi students in learning mathematics at a basic level**”. The main aims of this study were to find the achievement level of students and explore the strategy for promotion Thangmi students in learning mathematics and explore the ways to overcome difficulties faced by Thangmi students in learning mathematics. The design of this study was a sequential explanatory research design under a mixed research approach. The researcher used purposive sampling and selected sample schools from the Dolakha District. The researcher constructed an achievement test on the basis of the curriculum prescribed by the CDC and administrated it to sample schools of this research. Quantitative data were analyzed by the statistical tools and qualitative data were analyzed by the thematic network approach of analysis. Similarly, mathematics teachers, head teachers, Thangmi students and parents were also included in the interview. The researcher analyzed the collected data with the help of conceptual understanding on the basis of problems related to the learning environment at home and school, and the pre-knowledge of the students.

The finding of the study shows that there are lots of difficulties for Thangmi students in learning mathematics. Thangmi students have been facing difficulties with fundamental concepts of learning mathematics, the use of the knowledge of algebraic structure and syntax to form equations, manipulation of operator symbols procedure, the transformation of word problems, process skill, formulas, and theories in the new context, and pre-requisite knowledge. Behind problems that have been faced by Thangmi students, poor economic status of parents, poor management of school administration, and carelessness of students towards their study are found to be the causes behind the difficulties of learning mathematics, especially for Thangmi students.

TABLE OF CONTENTS

LETTER OF CERTIFICATE	ii
LETTER OF APPROVAL	iii
RECOMMENDATION FOR ACCEPTANCE	iv
DEDICATION	vi
DECLARATION.....	vii
ACKNOWLEDGEMENTS	viii
ABSTRACT	ix
ABBREVIATIONS	1
TABLE OF CONTENTS.....	x
LIST OF TABLES	xiv
LIST OF FIGURES	xv
CHAPTER I	1
INTRODUCTION.....	2
Background of the Study.....	2
Problem Statement	5
Objectives of the Study	6
Research Questions	6
The Justification of the Study	6
Delimitations of this Study.....	7
Operational Definition of Key Terms	7

CHAPTER II.....	9
REVIEW OF RELATED LITERATURE.....	9
Empirical Literature Review	9
Theoretical Literature.....	15
Cultural Capital Theory.....	15
Cultural Difference Theory.....	16
Cultural Difference and Discontinuity Theory.....	17
Conceptual Framework	19
- Cultural Capital Theory.....	20
The Implication of a Review of Literature.....	20
CHAPTER III.....	22
METHODS AND PROCEDURES	22
Research Design	22
Explanatory Sequential Approach.....	22
The Population of the Study.....	23
Sample.....	23
Sampling Strategy.....	23
Research Tools.....	23
Achievement Test.....	24
Development Process of Achievement Test	24
In-depth Interview.....	26

Observation.....	26
Documents Analysis.....	26
Quality Standards.....	26
Trustworthiness.....	27
Credibility.....	27
Source of Data.....	29
Primary data.....	29
Secondary data.....	29
Data Collection Procedure.....	29
Data Analysis and Interpretation Procedure.....	30
Ethical Consideration.....	30
CHAPTER IV.....	31
RESULT AND DISCUSSION.....	31
Analysis of Achievement Test.....	31
Identified Difficulties: arithmetic, algebra, and geometry.....	34
Causes of Difficulties.....	40
Remedies to Overcome Causes.....	45
CHAPTER V.....	50
FINDINGS, CONCLUSION, AND IMPLICATIONS.....	50
Finding.....	50
Conclusion.....	53

Implications	54
REFERENCES	55
Appendices	58

LIST OF TABLES

	Pages
Table 4.1: Mean and s.d on Achievement Test	31
Table 4.2: T-test on Achievement Test	32

LIST OF FIGURES

	Pages
Figure 2.1: Conceptual framework	19

ABBREVIATIONS

HCF:	Highest Common Factor
ICT :	Information Communication and Technology
LCM:	Lowest Common Multiple
NASA:	National Assessment of Students Achievement
USA :	United State of America

Chapter I

Introduction

Nepal is a multicultural and multi-social country where the different ethnic indigenous groups are Nepal among these groups, Thangmi is also a caste that belongs to the ethnic group. This is the study on promoting Thangmi students in learning mathematics at a basic level. This introductory part includes the background of the study, a statement of the problem, the rationale of the study, objectives of the study, research questions, significance of the study, delimitations, and definition of the key terms, respectively.

Background of the Study

Education as a system can be called the brain of any society and it is the backbone of any system. In the traditional sense, education in which instruction takes place between an instructor and students where all are physically present in the same classroom. But at present, it is the way of learning by social interaction. Traditional education refers to the mainstream educational environment not designated as an alternative. Mathematics is the fundamental subject for all streams in traditional or modern eras.

Mathematics is a subject that has a significant impact on people. Every people need mathematics to solve problem in their daily life activities. Mathematics is used throughout the whole world as an essential tool in many fields including natural sciences, engineering, medicine, and social science (Bell, 2008). As a school subject, mathematics has tremendous authority. Having difficulty with mathematics is a serious issue. Successes of failures in mathematics in school have a deceive influence on the choice of further education and carrier both access and necessarily self-

confidence. Mathematical skills and competency are very important to make life social and easier. Like mother-tongue competency, mathematics is associated with basic literacy and a corresponding literacy in case of its absence. It is a serious matter for a child to be successful in gaining functional mathematics skills. This lack of success may have consequences for both the child's perceptions of their capacity to manage the challenges of schooling and their future education and life (Lange, 2009).

Mathematics emerged as a subject of study along with civilization. In the present scenario mathematics is a necessary subject for living. This importance is evident in the school curriculum and the importance given to mathematics education. Learning in particular mathematics learning is a complex type of performance in human cognition. It is affected by many factors like short-term memory, long-term memory, the ability to memorize mathematical facts, and visual and spatial perceptual abilities (Chinn, 2013).

Nepal is a multi-caste, multilingual, multi-cultural, multi-religious country with 125 ethnic groups and their 123 mother tongue and geographical diversity and inhabited by various regional groups (National Census Report 2068). Because of diversity in Nepalese society, there are inequalities in socio-culture, economy, and education based on caste (Bista, 2004). In the past, education was taken as a privilege for the upper-class people but in the present, it is the fundamental right of all people.

Many students find their studies in mathematics to be difficult and unrewarding. There is a tendency for students to opt-out of studying mathematics as soon as possible. However, mathematics is usually seen to be important and holds a central place in the curricula in most countries. Mathematical ideas find application in numerous areas of life and many careers. Thus, negative attitudes among students

may have important ramifications for career choices and contributions to wider society (Akhter, 2018).

Mathematics is an essential part of the school curriculum of Nepal. It has been shown as a compulsory subject at all levels of school education programs.

Mathematics is also included as an optional subject in secondary level education.

Although mathematics has given an important place in the curriculum of all levels of school education. Most of the students are weak in mathematics and hence it is felt that most of the students' dislike mathematics and are afraid of it.

The Thangmi are an indigenous tribe of the hills east of the Nepalese capital Kathmandu. They mainly live in Suspa, Kshamawati, Khopachagu, Alampu, Bigu, Kalinchok, Lapilang and LakuriDanda villages of Dolakha district in East-Central Nepal. They are locally known as Thangmi. According to the 2011 Nepal Census, there are a total of 29,000 Thangmi of which some belong to the Kirant religion and some belong to Buddhism (National Census Report 2068). Legend says that the first Thangmi couple had seven sons and seven daughters. When the parents could not find suitable marriage partners for their children, they allowed them to intermarry. The Thangmi people are their descendants. The Thangmi men originally engaged in shifting agriculture besides hunting and foraging. They now earn a meager living through the stone quarrying business and by joining the military forces. To escape this extreme hardship, many have fled to India to find better jobs. Many upper-class members of the Thangmi clan are living in Bhutan. They go to Nepal in search of employment, and to do business. This is the context of the Thangmi people of Nepal. This research has searched the difficulties of learning mathematics of Thangmi students.

Problem Statement

Due to different kinds of problems like methodology, instructional materials, environment, teaching strategy, etc. Mathematics subject becomes more difficult for the students and there is less interest in mathematics, which becomes a phobia for the students.

This study has mainly concerned to promote the learning mathematics of Thangmi students. So, this study has discussed the learning difficulties which are faced by the Thangmi students. To improve the condition, this study has analyzed the difficulties in learning mathematics of Thangmi at the lower secondary level in terms of their achievement in mathematics, cultural effect on learning, learning opportunities, classroom social dynamics, curriculums, and language use in learning mathematics.

This study conducted the achievement test of Thangmi students and analyzed the reason behind the difficulties of learning mathematics in lower secondary level students. Previously, research had been done on the low achievement of Thangmi students in learning mathematics, it was found that lack of proper use of the learning mathematical tools is the major reason behind this problem. But Thangmi students are the indigenous ethnic group of Nepal, there may have many more reasons such that the lack of local teachers, and the lack of use of suitable learning strategies. They have their cultural background. They have low economic status, so they may have problems in communication, and they may have a problem with the textbook which is designed based on central students' necessities. Learning Difficulties in Thangmi Students in learning mathematics found the major difficulties and obstacles in learning mathematics. The researcher intended to find out the difficulties which are

faced by the Thangmi students in Learning Mathematics about different perspectives which are influencing learning mathematics at the lower secondary level.

Objectives of the Study

Objectives are basic tools that underline all planning and strategic activities. The following are the main objectives of the study:

1. To find the achievement level of students and explore the difficulties of Thangmi students in learning mathematics.
2. To explore the strategy for promoting Thangmi students in learning mathematics education.

Research Questions

To complete this study, the following questions have been taken as research questions:

1. What is students' level of achievement in mathematical concepts at the lower secondary level?
2. What type of learning difficulties do Thangmi students have in learning mathematics?
3. How do Thangmi students promoting their learning Mathematics education?

The justification of the Study

Mathematics provides an effective way of building mental discipline and encourages logical reasoning and mental rigor. Mathematics has got a prominent place in the school curriculum for its practical value. It has been taken as a compulsory subject at the school level and elective discipline at the higher level. It is used in every discipline of study. So, its significance has been increasing day by day. In this research, the learning difficulties being faced by the mathematics students and teachers will be the main focus of the study. Therefore, this study will provide some

logical and valuable information about the current problem of mathematics difficulties with the following significance.

- This study will be helpful to identify the achievement level and knowledge level in mathematics of Thangmi students.
- This study will be helpful to identify the learning difficulties of Thangmi students in learning mathematics.
- This study will be helpful to find and solve the learning difficulties of Thangmi students in learning mathematics.
- This study will help increase the learning activities of Thangmi students in mathematics.
- It will be useful to make inclusive classroom teaching.
- This will be useful for the Thangmi community, parents, teachers, students, and other stakeholders for conducting related programs in the future.

Delimitations of this Study

The delimitation of this study are:

- The research was delimited to only two schools Shree Kalinchowk Secondary school and Shree Pashupati Kanya Secondary school Dolakha district.
- This study has included only class VIII students from selected schools, so the finding would not be generalized elsewhere.
- The primary data for the research has been collected by achievement test, questionnaire, semi-structured interview schedule, and observations.

Operational Definition of Key Terms

Thangmi. The Thangmi are an indigenous tribe of the hills east of the Nepalese capital Kathmandu. They mainly live in Suspa, Kshamawati,

Khopachagu, Alampu, Bigu, Kalinchok, Lapilang and LakuriDanda villages of Dolakha district in East-Central Nepal. They are locally known as Thangmi.

Learning. Learning is the act of acquiring new knowledge and reinforcing existing knowledge, behaviors, skills, values, or preferences and may involve synthesizing different types of information.

Students. Students are the Thangmi Students who are studying in sample schools.

Achievement In this study, achievement means the score obtained by the Thangmi students in the lower secondary level.

Learning Difficulties In this study, difficulties in learning mathematics is an obstruction learning mathematics which students feel due to communication, interaction patterns and behavior, participation, and learning opportunities at home and school.

Problems. The problem as with any statement has solutions. Problems are that thing which is difficult to deal with or understand during learning mathematics.

Environment. It is a term that indicates home environments and school environments.

Chapter II

Review of Related Literature

Before conducting the research, work, and preparing the proposal, a review of related literature is a mandatory part of the research. This chapter elaborates on the existing literature and related study to the present study to find out what has been already studied and how those studies will be helpful for the present study. It is a comprehensive summary of previous research on a topic. Literature review surveys books, scholarly articles, and any other sources relevant to a particular issue, area of research, or theory, and by so doing, provides a description, summary, and critical evaluation of these works about the research problem being investigated. There are two types of literature review which are empirical literature review and theoretical literature review. So, the researcher has collected the different unpublished thesis, some books, journals, articles, and research that are related to cultural diversity and difficulty. Through the deep study of these reports, a researcher has reviewed the following literature as academic writing.

Empirical Literature Review

To complete this research, the following empirical literature was reviewed. Different kinds of literature were taken from different resources.

Air (2018) did a study entitled “Difficulties in Learning Mathematics of Raute Children” for the partial fulfillment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to explore the difficulties of Raute children in learning mathematics at the primary level and find the causes of difficulties in learning mathematics. This study adopted a qualitative research design which followed a case study design with 4

Rautechildren as a sample of the study by using the purposive and convenient sampling design. The research tools of this study were classroom observation forms, In-depth Interview schedule. The researcher used the theory of John, U, Ogbu's "cultural difference and discontinuity" to interpret the result and to get the conclusion. Thus, the study found that the cultural discontinuity at home and school, students' interpersonal factors, and their parents' economic condition affect their learning. As well as the language used by students, lack of local teachers, lack of secret room, and lack of practice are the major reasons that create main difficulties in learning mathematics for Raute students. Due to the above-presented reasons, students' enrolment in school and mathematics decreases. The researcher concluded that government should employ Rautes the increment their economic status and conduct a home awareness program and provide extra classes to Raute students to build the base of mathematics, make the classroom culturally friendly to decrease the gap between the research problem and the objectives of the research.

Shrestha (2016) conducted a study entitled "Cultural Diversity and Difficulty in Learning Mathematics" for the partial fulfillment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to identify the difficulties in learning mathematics of culturally diverse students at school and to explore the relationship between culture and learning mathematics. The researcher has used a qualitative research design with an ethnography research approach. The research tools used in this study were observation, in-depth interviews, and document analysis. He selected eight students as sample of this study in the government school of Kathmandu district based on purposive sampling. The study found that there is cultural diversity in the classroom. Culturally diverse students have many difficulties in learning mathematics. Pupils'

perception of mathematics, lack of culture-friendly curricular materials, mathematics anxiety, traditional teaching and learning methods, socio-economic status of a family, discrimination in the classroom, and home-school mismatch were the difficulties in learning mathematics of culturally diverse students at school. The researcher concluded that there should be integrated culturally relevant content and social issues, utilized culturally responsive instructional materials, and strategy and used cooperative learning in mathematics learning. Also, he concluded that mathematics teaching and learning ways the schooling is not good. Existing school mathematics teaching-learning practices seem to fail to address the social and cultural needs of the students.

Chaulagain (2015) did a study on the topic “Difficulties in Learning Mathematics of Tamang Students at Primary Level” for the partial fulfillment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to identify difficulties faced by Tamang students to learn mathematics and find the causes of difficulties in learning mathematics of Tamang students at the Primary level. The researcher selected five Tamang children as a sample for this study by using the purposive sampling approach. He used in-depth interviews and observation as tools for this study. In this study, the researcher found that cultural discontinuity, language difference, lack of interpersonal relationships, low socioeconomic conditions favorable school environments, lack of local teachers, etc. are the main causes of learning difficulties for Tamang students in mathematics. He concluded that teachers should have to use the practical method in teaching and use local teachers for learning mathematics.

Ghimire (2013) did research entitled “Difficulties of Bote Students in Learning Mathematics” for the partial fulfillment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to identify the difficulties of Bote students in learning mathematics at the lower secondary school level and to analyze the major causes of difficulties in learning mathematics. This study is based on in-depth interviews with children, classroom observation, and observation of the home environment and is necessary to gain teachers’ and parents’ perspectives. This research found that Bote students are socio-culturally bounded, they fall under the deprived group, and are suffering from partiality in society so, they bear inferiority complex in the psyche. The researcher got that there is a drastic gap between their home and school culture at the end which creates a barrier to learning mathematics. For learning mathematics, they have a lack of physical facilities, time consumed by various household tasks, and lack of learning materials due to poor economic conditions. Another major lack is that there is a vast communication gap between teachers, parents, and administration students’ learning. The researcher concluded that for the improvement of the learning mathematics procedure of Bote students teachers and parents should be equally responsible, for this, there should be an elimination of the gap between parents and administration and motivated the Bote students on learning mathematics.

Aale (2012) did a study entitled on “Mathematics Learning Difficulties of Magar Children at primary Level (A Case Study in Sindhuli District)” for the partial fulfillment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to analyze the role of cultural continuity of school and home culture in facilitating mathematics learning and to explain the individual learner and school strategies to address the

learning difficulties in mathematics of Magar students due to their cultural position concerning school culture. The researcher adopted purposive sampling to collect data. The tools of the research were interview schedules and observation forms. The researcher used the theory of John Ogbu to interpret the information and to get a conclusion. From this study, the researcher found that the cultural discontinuity, language, cultural practices, interpersonal relations, low economic conditions, unfavorable school environment for the different cultural groups, students, teachers, learning opportunities at home, lack of separate room to study, support of necessary learning materials were the main reasons for the difficulties of learning mathematics to the Magar students. The researcher concluded that relating the cultural practice of the students and learning management in the school promotes learning in mathematics.

Sapkota (2012) studied “A Comparative Study on Secondary School Mathematics Achievements of Baramu and Gurung students”. To compare the mathematical achievement of Baramu and Gurung students, this study is designed as a survey study where a mathematical achievement test is used as the main research tool. In this study, the t-test is used for the data analysis which shows that the Gurung students have higher mathematical achievement than the students of Baramu. Also shows that the home environment, socio-economic status, parent education, occupation, and the study hours of the students are the main affecting factor of students in their mathematical achievements.

Bohora (2011) studied “A Comparative study of Mathematics achievement among Chhetri and Tharu Children”. This study is on Grade ten students in Bardia District. The main purpose of this study is to compare the mathematical achievement of Chhetri and Tharu students in grade ten. For this, the study is designed as a survey

study where an achievement test is used as the main research tool to collect the required data, and for data analysis t-test is used. This study shows that the mathematical achievement of Chhetri students is higher than the Tharu students.

Rijal(2008) did a study entitled on “ Difficulties in Learning Mathematics: A Case Study of Rana-Tharu Students” in Kanchanpur District for the partial fulfillment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to find the difficulties and causes of difficulties in learning mathematics of Rana-Tharu students. The research adopted the qualitative research design in which the case study approach was used. The research tools of this study were observation from, In-depth interview schedule. The finding of this study shows that there is a cultural difference and discontinuity at school and at home. There is discontinuity because of language, lack of interpersonal relations, and no proper interaction between teacher and students. The home environment and school environment are not conducive to mathematics learning.

Yadav (2008), Studies on, “Causes of low achievement in mathematics”. This study was conducted on five students of Musahar communities that were selected in a random sampling process. In this study interviews, observation, and written tests are used to get the proper information for this study. This study shows that language, socioeconomic condition, motivation, and learning environment are the main factors that lead to the low achievement in mathematics of students.

After studying the overall literature, the researchers have found more problems related to teaching and learning mathematics. Most of the researchers have focused on methodology and instructional materials which are not getting sufficient results as the information. So, the researcher studies the genetic, environmental, and overall aspects of Thangmi students in learning mathematics. Therefore, determining

the gap and deciding to find out the solution to the student's difficulties in learning mathematics has been selected as the research topic.

Theoretical Literature

The following theories related to the research topic and relevant to the study are reviewed and summarized below:

Cultural capital theory. The Marxist sociologist Pierre Bourdieu is the theorist most closely associated with developing the concept of cultural capital and applying it to education. Cultural Capital Theory is a Marxist theory of differential educational achievement. In contrast to the cultural deprivation theory, the cultural capital theory does not see working-class culture as inferior or lacking in any way, it just sees it as different from middle-class culture. Instead of blaming working class underachievement on flawed working-class culture, the cultural capital theory focuses on the dominance of middle-class culture in society and social institutions. In short, middle-class children are more likely to succeed because the education system is run by the middle classes and works in their interests. The middle classes can define their own culture as superior and thus working-class culture and working-class children are marginalized in the education system and end up underachieving (Bourdieu, 1977). Bourdieu argued that each class has its cultural framework, or set of norms, values, and ideas which he calls the habitus. This habitus contains a set of assumptions about what counts as good and bad taste which influences the kind of leisure activities different classes engage in, the kind of places they visit, where they go on holiday, the kind of television programs they are likely to watch, what kinds of books they are likely to read and the type of music they are likely to listen to (Bourdieu, 1977).

The middle-class habitus places much more value on the following kinds of activities, and thus these are the kinds of activities to which middle-class children are more likely to be exposed compared to working-class children. Middle-class culture is also the dominant culture in most schools, and schools place a high value on the above types of middle-class skills and knowledge. Middle-class children thus 'just fit in' with middle-class schools, they are at home in a middle-class environment, and they don't need to do anything else other than being themselves to belong and thrive at school (Bourdieu, 1977).

One important (and easy to understand) aspect of the cultural capital theory is educational capital – middle-class parents are educated to a higher level than working-class parents (they are more likely to have university degrees) – an obvious advantage of this is that they are more able to help children with homework throughout their school careers, but they are also more likely to socialize their children into thinking that going to university is a normal part of life. The theory links inside and outside school factors: middle-class families and middle-class schools work together to exclude working-class children (Bourdieu, 1977).

Cultural difference theory. The major proponent of the Cultural Difference Theory is Fredrick Erickson. In this theory, he uses the term "micro-ethnography" to describe his technique of "situation-specific analysis" (1976). Using this technique, he observes "naturally occurring interaction in people's lives..." (1976:137) in this way, Cultural Difference Theorists are more focused on the `microelements of people's lives and communities. As Erickson points out this theory "provided a way of seeing classroom troubles as an inadvertent misunderstanding as teachers and students playing into each other's cultural blind spots" (Anthropology and Education Quarterly, 1987). In 1982 Shirley Brice Heath's study of three populations in the Piedmont

Carolinas area brought to light the components of micro-communication differences. Some differences included cultural and socio-linguistic variability. Most of this study prompted educators to modify teaching methods to accommodate the different "ways with words" and understandings. Teachers, parents, and students involved admitted that they had gained insights from the process of sharing information across groups.

Cultural difference and discontinuity theory. The cultural difference theory is based on the idea that students who are raised in different cultural settings may approach education and learn in different ways. Teachers need to be aware of the difference between the school atmosphere and the home environment. The researcher had tried to explain the empirical evidence of the learning difficulties of Thangmi children studying in the early grade of basic school vanish this so a brief of an underlay of than theory is discussed here. The cultural discontinuity can be defined as disconnections and inconsistencies between school-based norms and values and those of some students, often from non-dominant cultures. The cultural discontinuity can be used as an analytic or theoretical tool to explain educational practices that demonstrate such disconnections and inconsistencies. School-based norms and values are socially and culturally constructed by people.

Ogbu(2000) delineates the cultural difference and cultural discontinuity theory that deals with the problem in children's learning caused by the difference and discontinuity between the culture of home and school. He claimed that those students, whose home cultures are much similar to the cultures of the school can, cope and adjust easily to the system which may result in better learning achievement. Similarly, children with unmatched and dissimilar home cultures with school cultures cannot easily adjust and cope with the school's learning environment. As a result, they have more difficulties learning in the classroom environment. Ogbu furthermore argues

that discontinuity is also occurred in the area of language, thought and measurement it happens mainly due to the difference in the home/community which is informal education and the style used in school is formal education.

Ogbu(2001) emphasizes learning not only as the product of the culture and language differences but rather the nature of the relation between the culture and language of minority/disadvantaged and dominant groups. The advantaged/dominant group controls the school system through the implementation of their curriculum, using their language as the only means of instruction of learning. Regarding cultural differences, identity, and school learning, he has put the example in the case of the United States of America.

Ogbu(2000) has emphasized two types of cultural differences which are the primary cultural difference of voluntary minorities and the secondary cultural difference of involuntary minorities. As his study suggests, involuntary minorities face more difficulties in school learning and mainstream culture. However, he developed the theory of cultural difference in the case of the USA; it might imply this study related to cultural discontinuity and learning difficulties in mathematics of Thangmi students.

Ogbu's theory has generated considerable research, commentary, and criticism. Criticisms include a lack of attention to social class and gender, misuse of the term caste, and misconceptions regarding the social construction of race. He suggested that policies will fail that do not address the community forces that foster underachievement. He was dubious and interventions such as school choice, cooperative learning approaches that capitalize on the assumption that minority groups value cooperation and collaboration, and culturally responsive education that

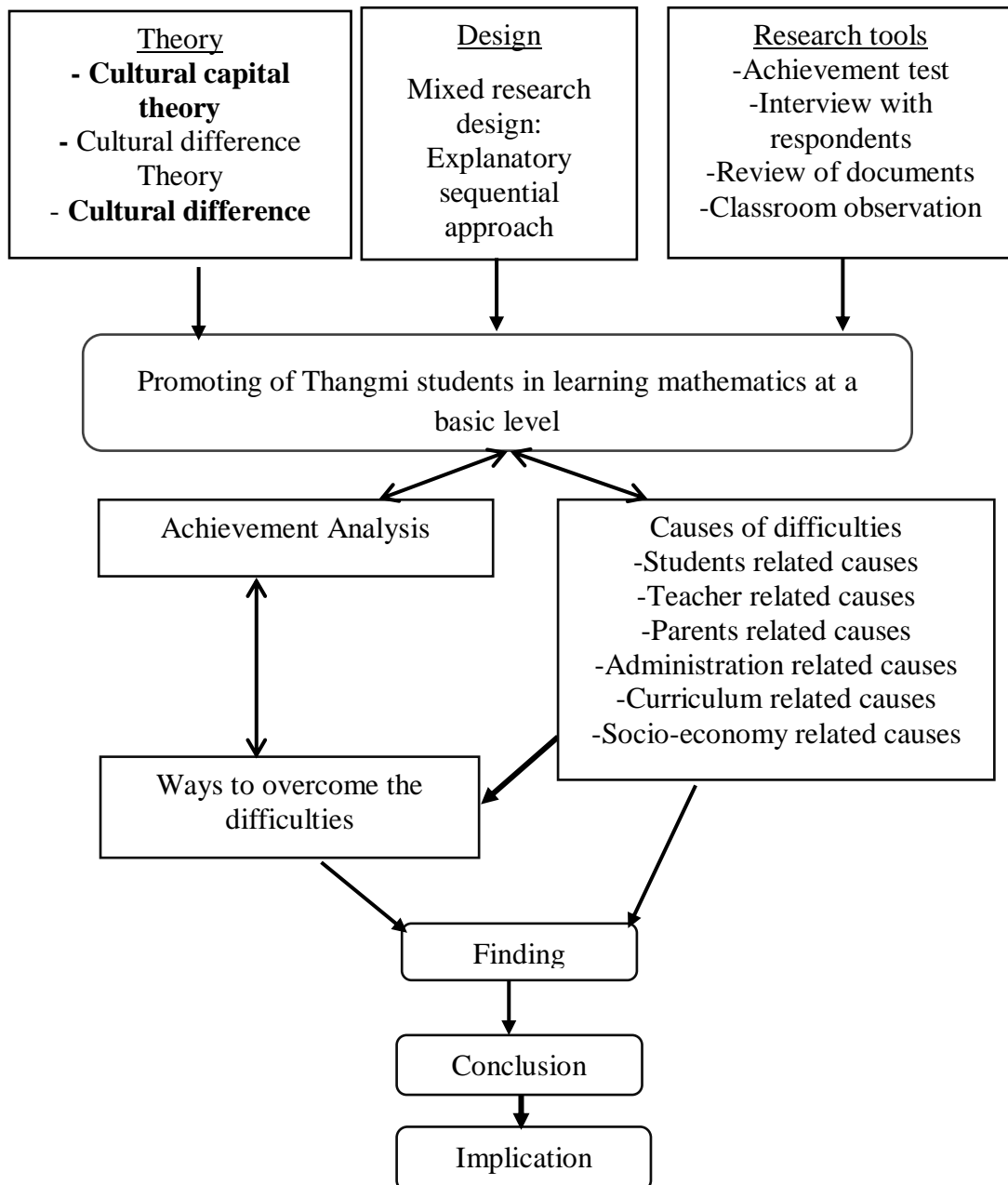
supports cultural practices and learning styles. He wrote that they did not address community forces that foster avoidance of hard work. He recommended that schools implement minority achievement programs that reform community forces to support academic achievement. Such a program should demonstrate the link between schooling and adult futures, teach good study habits, and expose students to successful models who thrived in school. The intent would be to create a collective identity that facilitates rather than undermines academic achievement.

It might imply this study related to cultural discontinuity and learning difficulties in mathematics of Thangmi students who are also a disadvantaged group in terms of the culture of discrimination, domination, and background from the mainstream. Mainly, Thangmi children hesitated to interact with other children as well as with the teacher in the school and as well as in the community. As well as, Thangmi have low economic status, and because of that their children used to go to school very rarely.

Conceptual framework

The conceptual framework is the researcher's understanding of how particular variables in his study connect. It is an analytical tool with several variations and contexts. It identifies the variables required in the research investigation. It is used to make conceptual distinctions and organize ideas. Strong conceptual frameworks capture something real and do this in a way that is easy to remember and apply (Shrestha, 2016). For this study some variations are included for the conceptual analysis that is as below:

Fig. 2.1

Conceptual framework**The Implication of a Review of Literature**

This is an essential part of the study. It provides fundamental knowledge on the topic and helps to identify the inconsistencies and gaps in research. It provides a

foundation of knowledge on the topic identifies areas of prior scholarship to prevent duplication and give credit to other researchers, identifies inconsistencies: research gaps, conflicts in previous studies, open questions left from other research, and identifies the need for additional research (justifying this research) for the research. The review guides the variables that may be important to include in developing a typology and the specific measures that may be most valid. The review helped to develop a better research design, and research tools and helped the ideas for interpretation and analyzing the collected data from different sources.

Chapter III

Methods and Procedures

This chapter describes how the study would be conducted to obtain the objectives of the study. It determines how the research becomes complete and systematic. The method applied in this study is discussed in the following sections: Research design, methodology, study area, sources of data, the population of the study, sample population and sampling procedures, data collection procedures, data analysis, interpretation procedures, ethical considerations, etc.

Research Design

This study was based on a mixed research approach with an explanatory sequential design. This design consists of two distinct phases: quantitative followed by qualitative (Creswell et al. 2007). The qualitative data are collected and analyzed second in the sequence and help explain, or elaborate on, the quantitative results obtained in the first phase. The rationale for this approach is that the quantitative data and results provide a general picture of the research problem; more analysis, specifically through qualitative data collection is needed to refine, extend or explain the general picture.

Explanatory Sequential Approach. The mixed methodology is the cornerstone of research within social science that is experienced within everyday life” (Creswell & Plano Clark, 2011; Johnson & Onwuegbuzie, 2004). Mixed methodology is described as being “the third paradigm” (Johnson & Onwuegbuzie, 2004:15); a “third methodological movement (Teddlie & Tashakkori, 2009:1); and includes two (or more, or both) quantitative and/or qualitative approaches (Morse & Niehaus (2016). It no longer restricts the researcher to particular paradigms that have been traditionally

the case and is considered a legitimate means of undertaking research in social and human science (Creswell & Plano Clark, 2011).

The Population of the Study

This is quantitatively followed by qualitative research and the researcher has explored the difficulties of Thangmi students in learning mathematics at the lower secondary level. So, the Thangmi students who are studying at lower secondary levels all over Nepal are the population of this research.

Sample

The sample of this study has taken from class VIII from two schools in the Dolakha district. There were 40 students of lower secondary level from the Thangmi community. All students were taken to take an achievement test for the quantitative data and out of 40 students 3 students were taken to get the data for the qualitative approach.

Sampling Strategy

The researcher has used the purposive sampling strategy to bring out sufficient data in a qualitative approach and simple random sampling for quantitative design.

Research Tools

The researcher has used achievement tests, in-depth interviews, document analyses, and observations as research tools. Marks obtained by achievement tests helped the researcher to understand the recent context of the learning level of students in mathematics at the lower secondary level. In-depth interviews, observations, and document analyses were more helpful to obtain the data for analyzing and exploring the students' difficulties in learning mathematics and they

helped to find the causes of difficulties and measure for overcoming the difficulties in learning mathematics.

Achievement Test. An achievement test is designed to measure a person's level of knowledge, or skill in a specific area. This tool has supported finding the achievement level of Thangmi students in mathematics. To identify the achievement of Thangmi students at a basic level, the researcher developed an achievement test based on the national goal of mathematics at the basic level. The test covered the major area of mathematics such as arithmetic, algebra, and geometry. And these test items have been selected based on Bloom's Taxonomy. To find the difficulty level of the test, the test was trialed on 15 students as a pilot test. The reliability and validity of the test have been maintained with the help of the supervisor of this study and using the specification grid provided by CDC.

Development Process of Achievement Test: To identify the achievement of students' basic level, the researcher constructed an achievement test for grade VIII based on the national goal of mathematics on the basic level. The test covered the major area of mathematics such as arithmetic, algebra, and geometry. And these test items were selected on the basis of the specification grid of grade VIII issued by CDC Nepal. To find the difficulty level of these tests, were tested on 15 students of these level through pilot and used the mathematical procedure.

According to Ebel, the general guidelines for difficulty index and discriminating index (D.I)

Formula for difficulty index:

$$D.I. = \frac{RH+RL}{N}$$

Where, RH = right answered in highest

group

RL = right answered in lowest

group.

N = total number of

examinees.

Formula for discrimination index:

$$D.I. = \frac{RH-RL}{n}$$

Where,

RH = right answered in highest group

RL = right answered in lowest group.

n = total number of examinees in the highest or lowest group

From the item analysis; for the selecting items for the final achievement test. It was decided that questions numbers 2, 4, 20, 32, and 34 have been eliminated (Appendix-B). In this way, an achievement test was constructed.

Reliability and validity of achievement test. Reliability refers to the accuracy of measurement. It is one of the important characteristics of good tests and measuring instruments (Sharma, 2000, p.222). For the reliability of these achievement tests, the researcher used the Kuder Richardson method were used and found that the reliability of the test was 0.14413.

Similarly, Validity is another essential part of the achievement test. The validity of a test refers to the degree to which the test actually measures or which it purports to measure (Bajracharya, 2007, p.121). The validity of these achievement tests has been maintained with the help of content and specification grid preferred by the curriculum development center, expert judgments, and theoretical backgrounds.

In-depth Interview. The researcher prepared interview guidelines including open-ended topics based on the research document, objectives of the study, and situation of the environment. Then the researcher met the head teacher, subject teachers, students, and parents individually by making them clear the purpose of this research and the importance of their help. These interviews helped the researcher to get the leading factors that affect the students' mathematics achievement.

Observation. To collect the information for research, observation is one of the most important techniques. Observation helped to collect the information which was not able to collect through other tools of data collection.

Documents Analysis. For this research, documents such as students' records, attendance registers, and marks ledgers have been analyzed and collected information used to find difficulties and causes of learning mathematics of Thangmi students.

Quality standards

Quality standards are defined as documents that provide requirements, specifications, guidelines, or characteristics that can be used consistently to ensure that materials, products, processes, and services are fit for their purpose. Quality research most commonly refers to the scientific process encompassing all aspects of study design; in particular, it pertains to the judgment regarding the match between the methods and questions, selection of subjects, measurement of outcomes, and protection

against systematic bias, nonsystematic bias, and inferential error (Boaz & Ashby, 2003). In research, for the quality standard, trustworthiness is one of the most essential parts. Every research must contain its norms and value.

Trustworthiness. Trustworthiness is the ability to be relied on as honest or truthful. Trustworthiness of a study refers to the degree of confidence in data. Due to the nature of qualitative research, there may be many doubts that occur during and after the research process. Through the trustworthiness, every doubt of this nature of research may be minimized through the aspect of trustworthiness. Trustworthiness has four key components: credibility, transferability, dependability, and conformability. (IHRCS, 2016)

Credibility. To determine the trustworthiness of any qualitative searcher, credibility is the one of the important aspects, or criterion that must be established in such types of research. This helps to link the research study's findings with reality in order to demonstrate the truth of the research study's findings. Credibility refers to the extent to which a research account is believable and appropriate, with particular reference to the level of agreement between participants and the researcher. (Mills, Durepos & Wiebe, 2010). Especially, credibility contains the triangulation and member checking in research

Triangulation involves utilizing different data collection methods in order to check the consistency of the findings. In this research, the researcher used in-depth interviews, observation, and document analysis. Through the information taken from different tools, the researcher has come to the conclusion of this study

Member-checking is the second important technique that qualitative researchers use to establish credibility. This is a technique in which the data, interpretations, and

conclusions are shared with the participants. It allows participants to clarify what their intentions were, correct errors, and provide additional information if necessary.

Transferability. Transferability referees the generalization of research findings to other situations and contexts. Transferability is established by providing readers with evidence that the research study's findings could be applicable to other contexts, situations, times, and populations.

In this research, to maintain the transferability of the research, the researcher has taken samples by using a purposive sampling procedure and included photos of achievement tests and records of all the activities done during the research. As well as, the researcher has taken many guidance and suggestions from the experts.

Dependability. In research, dependability implies the stability of research findings over time and situations. Dependability involves participants' evaluation of the findings, interpretation, and recommendations of the study such that all are supported by the data received from participants of the study. (Kortjens&Moser ,2018). In this research, the researcher had observed the research area to know the real reality of this group's students and has done some conversations with other communities' persons for getting the reality as well as taken some guidance and suggestions from the experts.

Conformability. Conformability is the last criterion of Trustworthiness that a qualitative researcher must establish. This criterion has to do with the level of confidence that the research study's findings are based on the participants' narratives and words rather than potential researcher biases. Conformability is concerned with establishing that data and interpretations of the findings are not figments of the inquirer's imagination, but clearly derived from the data. (Kortjens&Moser ,2018). In

this research, the findings of the study are based on the participants' narratives and words rather than potential researcher biases.

Source of data

The researcher used both sources primary and secondary sources of data which are described below:

Primary data.Data that obtained through above mention tools have been taken as the primary data of this research work. This type of data helped to analyze the level of mathematical achievement of students, find the difficulties in learning mathematics, and the leading factors that affect the learning and achievement of the students.

Secondary data.The data which are published in newspapers, journals, etc. about Thangmi student learning has taken as the sources of secondary data for this research. The recorded file, results, school documents, school articles, and journals were used as a source of secondary data.

Data Collection Procedure

In this study, to collect the data or to get the information, the researcher visited the sample schools which are located in the Dolakha district. The researcher visited Shree Kalinchowk Secondary school and And Shree PashupatiKanya Secondary school. And researcher met the school administrator and teacher and takes permission to take the required information. Then researcher took permission to conduct the achievement test from the administration. For the qualitative part of the research, the researcher had taken interviewed the principal, teacher, and students to know the major difficulties in learning mathematics, causes, and ways to overcome the difficulties. By rapport building with parents,' the researcher took the interview to the parents as well.

Finally, the researcher was thankful to the administration, teachers, students, and parents and to all who helped in the study for their kind support and cooperation.

Data Analysis and Interpretation Procedure

The data analysis method includes both qualitative and quantitative procedures. The quantitative method used different statistical tools for the analysis of data and the qualitative method will organize data, transcribe the data and give coding data and build a theme and compare and describe the data comparatively. Qualitative data was analyzed by using the thematic approach of analysis. At last, the researcher has prepared a report on the finding and conclusions of this study.

Ethical Consideration

This study was conducted for academic purposes while collecting data, ethical considerations have been taken to ensure primary data privacy. Regarding this study, the researcher informed the objectives respondents. The researcher will not use the data for another purpose except for my research.

Chapter IV

Result and discussion

This chapter is the main body part of this study. The primary and secondary data are collected in unprocessed form. So, in this chapter, such unprocessed data are presented in systematic formats and analyzed using different statistical tools and techniques. The collected data from different sources are presented and analyzed separately using both qualitative and quantitative measures. In this course of analysis, data gathered from various sources have been inserted in tabular form. The research finding is interpreted, explained, and presented about the objectives specified for the study.

The data were collected from 40Thangmistudents by using achievement tests, and interviews with sample respondents including ten students, two subject teachers, and principals from three sample schools. The result of achievement has been compared to the standardized test National Assessment of Students Achievement (NASA).

Analysis of Achievement Test

Within the context of educational programs, there is a continual process of evaluation that also includes teacher-made tests and letter-grade performance standards. The standardized objective achievement test based on a normative sample was first developed by Rice in 1895. His spelling test of 50 words (with alternate forms) was administered to 16,000 students in grades 4 through 8 across the country. Rice went on to develop tests in arithmetic and language, but his major contribution was his objective and scientific approach to the assessment of student knowledge (Feuerstein, 1970).

In this topic, necessary information, and data are collected in numerical form. For the quantitative data analysis, an achievement test had been taken. This test had

been prepared on the basis of Bloom's taxonomy. The collected data are analyzed by using descriptive data analysis tools. An achievement test is a test of developed skill or knowledge. The most common type of achievement test is developed to measure skills and knowledge learned in a given grade level, usually through planned instruction, such as training or classroom instruction. It measures a pupil's achievement and progression in a specific subject or topic over a set period of time.

In this study, to recognize the mathematical achievement and progression of Thangmi students, an achievement test has been taken. The test has full marks 35 among 35 numbers of questions from the different domains of objectives. After testing the achievement test among 40Thangmi students of class VIII, the following result has been derived.

Table no. 4.1

Mean and s.d. on Achievement Test

	N	Mean	Std. Deviation	Std. Error Mean
X	40	8.1750	6.78946	1.07351

From table no. 4.1, the researcher found that the average obtained marks of Thangmi students of grade VIII is 8.1750 out of 35. According to the National Assessment of Students Achievement (NASA), 2013 for grade VIII, the national level of achievement in mathematics average is 35 out of 100 which is 12.25 out of 35. It shows that the average obtained marks of Thangmi students is less by 4.075 than NASA, 2013. Similarly, the range of obtained marks of Thangmi students in

achievement tests is found 31 where the maximum obtained mark is 32 and the least obtained mark is 1. The standard deviation of obtained marks of Thangmi students is 6.78946. It shows that Thangmi students have large variations in their obtained marks.

Education in Nepal has been influenced in several ways by the legacy of the historical caste system which still remains in the mindset of people in Nepalese society. Historically, the Brahmans and Chhetris have been heavily involved in education, but Thangmi, for example, has remained outside the educational system. Hence, modern society has made lots of efforts to make education accessible for all children regardless of caste and ethnicity. Thangmi's achievement score in Mathematics is lower (33.26%) than the average achievement of class VIII according to NASA report 2013 AD. Thus, it shows that the average mark of Thangmi students is less than the average marks of students studying in class VIII in NASA report, 2013. We concluded that Thangmi students have difficulties in learning mathematics at the basic level.

Table no. 4.2

T-test of Mean on Achievement Test

	Test Value = 12.25					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
x	-3.796	39	.001	-4.07500	-6.2464	-1.9036

Table no. 4.2 shows the mean difference between the achievement of Thangmi students and average marks of class VIII according to NASA, 2013 is -4.075 which a

lower difference is -6.2464 and the upper difference is -1.9036 in a 95% of the confidence interval. Similarly, the table shows that the t-value is -3.796, and the p-value of $0.001 < 0.05$ implies there is a significant difference between the mean achievement of Thangmi students and the national achievement of students in mathematics. Behind the less than average marks of Thangmi students, there might have different affecting factors. So, under this test researcher assured that there are different factors and difficulties in learning mathematics for Thangmi students. There might be some reasons or leading factors that lead the Thangmi students to obtain very low achievement in mathematics.

Identified difficulties: arithmetic, algebra, and geometry

This topic has explained the difficulties of Thangmi students in learning mathematics. It contains the difficulties and causes of difficulties in learning mathematics. The Algebra Achievement test was developed by the researchers to collect the data. Questions of the algebra achievement test were related to knowledge level, skill level, and application level. Under this topic, difficulties in basic knowledge, difficulties in understanding the knowledge, difficulties in the manipulation of operators' symbol procedure, difficulties in transformation, difficulties in applying skills, difficulties in process skills, and difficulties in encoding were identified as the major obstacles of Thangmi students in learning mathematics. *Geometry* is a branch of mathematics that is concerned with the properties of configurations of geometric objects - *points*, (straight) *lines*, and *circles* being the most basic of these. It is an aspect of mathematics that deals with the study of different shapes. These shapes may be plane or solid. A plane shape is a geometrical form such that the straight line that joins any two points on it wholly lies on the surface. A solid shape on the other hand is bounded by surfaces that may not wholly be represented on a plane surface. This topic includes

the different difficulties in geometry such as basic knowledge, understanding, an operator using geometry, applying skills, process skills, and encoding.

Respondent A

In this study, the researcher interviewed respondent A. He is studying in class eight in School's of Dolakha. He is the son of Mr. and Mrs. Thangmi. They have three sons and respondent A is younger. The researcher made a questionnaire for him to understand his difficulties better regarding the very nominal concept of algebra which believes an eighth grade must understand very well.

The researcher had asked very minor questions such as if the selling price is greater than the cost price, what will happen either loss or profit, how to convert any number in percentage etc. But this respondent was not able to answer the above questions. The researcher asked about his daily routine at home and school. He answered *"I wake up early in the morning and use to go jungle with mother to bring grass for the animal. Then I take my lunch and go to school. At school, the teacher teaches us mathematics. I tried to understand mathematics but I could not understand it clearly. I feel mathematics is a very difficult subject than the other subjects. I do not understand the mathematical term told by sir. Sometimes language might be the problem to understand the mathematical contents. In the evening when I reach home, I usually leave to do the work on mathematics. The next day when I will reach at school, I usually ask my friend to give me a mathematics copy to copy the solution. In this way, I pass my days in school and home."* In the line of the interview, he said that he is not clear in each chapter of mathematics and has a language problem in mathematics.

Difficulties in basic knowledge. Knowledge is the first level of the cognitive domain of Bloom's taxonomy. Acquisition of knowledge is the lowest level in the

cognitive domain. It includes the ability of students to recall and remember the information learned in the classrooms. Recall and recognition are the specifications of this instructional objective. For testing the basic knowledge which is determined by the primary goals of mathematics. The researcher has asked different questions from different levels of objectives of knowledge. From the respondent 'A', the following difficulties in basic knowledge of algebra are generalized:

On the answers provided by him, it became pretty clear that he undoubtedly was unable to concisely state the very minor concepts constituting the subject. In the achievement test, a question testing the value of 'x' on a linear equation was asked but he left its solution blank. By showing his answer sheet with him and researcher raised the queries on question task 14 that why he left this question. He expressed his terribleness while solving this type of question. He said that he had never seen this type of problem. He does not know the basic fundamental concepts of the equation. So, he left this problem while solving it.

Difficulties in understanding. Understanding the mathematical terms, symbols, signs, and connection of steps are the most essential components for solving problems relating to algebra. By taking interviewed respondent 'A', he has problems relating to difficulties in understanding the structure, and difficulties in understanding the abstract nature of algebra. He has no understanding of the different terms which are used in algebra such as variables, constant terms, and expressions. Similarly, the respondent has no understanding of where we are supposed to use variable terms in the verbal/word problems. So, even he did not know whether the variable term is supposed or not in word problems. From this, the researcher concluded that this respondent doesn't have an understanding of the solution to algebraic problems. So, common difficulties faced by him in this domain are lack of clarity while solving basic

equations, a basic understanding of letters and their place in algebra, the skill of manipulation of letters, symbols, or variables, lack of understanding the use of rules of manipulation to solve equations, lack of the understanding of use of the knowledge of algebraic structure and syntax to form equations and use and understanding of algebraic notations in the context of the generalization of patterns.

The researcher asked respondent B about her understanding of different terms of mathematics which are very essential to solving the problems. She answered *“I am the eldest daughter of my family. I have the responsibility to cook the food every day at home as well as to care for my younger brother and sisters. I cannot able to give sufficient time at home for my study. Mathematics needs much practice; time is not favoring me. I quite understand at school but with lack of time and practice, it becomes more difficult day by day. Till class 6, I had a good performance but then I could not able to perform well. Now I have zero knowledge of mathematics. I think from next year I won't continue my class.”* She has problems at home. She does not have sufficient time to study at home. So, she has no understanding of the different terms which are used in mathematics such as universal set, subset, solution point, selling price, cost price, percentage, square root, LCM and HCF, intersection, union, alternate angles, range, marked price, ratio, variables, constant term, expression, etc. Similarly, the respondent has no understanding of where we are supposed to use variable terms in the verbal/word problems. So, even she did not know whether the variable term is supposed or not in word problems. From this, the researcher concluded that this respondent doesn't have an understanding of solutions of mathematical problems from all domains (arithmetic, algebra, geometry, and statistics).

Difficulties in the manipulation of operator symbols procedure. In the process of simplifying algebraic expression or solving an algebraic equation students are

required to apply a succession of transformation rules in their manipulation of symbols involved such as the equal sign ($=$), operation signs ($+$, $-$, \times or \div , variables (x , y etc) and a variety of types of numbers (5 , $\frac{3}{4}$, $.23$) which may appear as constants, coefficients or other roles in the equation. The order of operation is very important when simplifying expressions and equations. For the case of respondent, A, he has the difficulties on the use of operator in order on the expression. He was not able to manipulate the operator. On solving, this problem requires procedural capability that is in operation paying attention to the result. So that, when students find it difficult to solve the problem, the procedural ability of students is still low. Hence, procedural ability is a one of the biggest difficulties of the respondent A.

Difficulties in the translation of word problems. Difficulties in transformation refer to problems on transforming the word problem into algebraic expression. Solving word problems is the main difficulty in algebra to school students all over the world. Difficulties in transformation occurred when students correctly comprehended what the question required, but were not able to identify the correct mathematical operation or sequence of operation to successfully solve the question. The difficulties in transforming language into algebraic expression and visual representation are one of the major difficulties of respondent A which shows the conception of making the expression of respondent A.

He has to transform the given information into the form of algebraic expression. The interesting finding of respondent A is difficulties were also found during the process of transforming language into a symbol and vice versa. In transforming language into symbols, his difficulties lie in finding the correct mathematical model for the given written information. Therefore, his error in this question indicates difficulties in transformation.

From above, the solving process is also the difficulties of students in solving the algebraic problems. Polya (1945), also found that students had significant difficulties in transferring their problem-solving skills from verbal representation to graphical and functional representations. Moreover, there was still an increase in difficulties in quantities, formulae, values, and calculations. Thus, it is concluded that the transformation of given verbal problems is another difficulty of respondents in learning algebra.

Difficulties in applying skills. In geometry, applying skills takes as construction, and calculation, shown, solved the different problems regarding geometry. If the students can use the formula, technique, ideas, and logic in a suitable context according to their previous learning then we can say that he/she has the applying skill. For the basic level, at least students should have to apply the formula which he/she learned in one context to another context. It is believed that students could solve, and use the formula of area and perimeter of the square, or rectangle from one context to another new context. Similarly, in arithmetic applying skill means the use of any formula which was read in one situation to another situation. In the case of respondent 'C', she can shade the region to the given set notation on the Venn diagram but he could not use the formula which was constructed from the Venn diagram to the verbal question. From the solution to question number 15, this can be seen.

we can see that respondent C has difficulties in applying skills. The researcher has asked the question to find the complement of A union B to respondent C but he answered that he does not know the formula. Also, the researcher was asked about the use of the Venn diagram from the set, he said that he knew the formula to find any sets but he did not know the actual context to use the formula. From this researcher got the conclusion that the respondent knew some formulas from different topics in

mathematics but did not know how to use those formulas in the new context. It shows that Thangmi students have difficulties in applying the skill.

Thus, they have difficulties with basic concepts, processes, and understanding of structure. They have difficulties sequencing multiple steps, become entangled in multiple steps or elements of a problem, they are not able to identify salient aspects of a mathematical situation, particularly in word problems or other problem-solving situations where some information is not relevant. They have trouble learning or recalling abstract terms, have difficulty understanding directions, and have difficulty explaining and communicating about math, including asking and answering questions.

Causes of Difficulties

The researcher found that the lack of laboriousness of students' lacks sufficient prior knowledge of the subject matter, mathematical anxiety, less consciousness towards the study, and daily homework are the major factor that causes difficulties in learning mathematics for Thangmi students. Pre-knowledge related to content in students is one of the most important factors related to students for excellent future learning. "Students who had a more integrated prior-knowledge base and were able to operate on higher levels of procedural prior knowledge at the beginning of the course were more likely to be successful" (Bom, 2009). After analyzing the achievement test of Thangmi students, we conclude that they have poor mathematical concepts and they are careless towards their studies. Mathematics anxiety is one of the important aspects of the International Journal of Elementary Education 2017 student's related factors in learning mathematics. Math anxiety has been defined as "an inconceivable dread/fear of mathematics that can hamper manipulating numbers and solving mathematical problems within a variety of everyday life and academic situations"(Buckley & Ribordy, 1982, p.1).

In School's Dolakha, the mathematics teacher asked to the students about the pre-knowledge of this topic but every student was silent and nobody answered this question and although they have nervousness and not to be frank with teacher and students they seem like they are afraid with the teacher and if I answered somebody will laugh and hesitated me after finished the class respondent D who is one participant of this research said to the researcher.

It shows that anxiety brings a wrong and negative concept in mathematics and de-motivating their learning mathematics which makes mathematics difficult.

Teacher-related causes are also very important cause behind the difficulties in learning mathematics. Positive behavior of students and interaction with students helps to increase the learning interest in mathematics and provides a positive motivation in students to learn. "Teacher behavior is one of the key determinants informing the student's motivation and learning" (Article in *Acta Kinesiologiae Universitatis Tartuensis* · January 2012). A principal of sample school A said *"Teacher always uses lecture method and problem-solving method in mathematics classroom. I told them to use modern teaching technology and methodology. But they have no readiness to use it."* From the observation and interview, the researcher found that still, the teacher is using teacher centered methods, their teaching style is still old fashion, and no teaching material is used during the teaching period even in geometry also the same case is going on, no interaction with students, no group discussion, no any project work has given. By these activities of teachers, students can't be interested to study mathematics in school as well as at home. Hence, teacher behavior and method, and materials used by teachers are taken as the causes of difficulties for Thangmi students in learning mathematics

According to Kullar (2011) school, leadership behavior and style can have a positive effect on students' achievement. But Kruger (2003) stated that principal leadership has only an indirect impact on student achievement. School principals should focus on improving the school's climate to obtain better relationships with teachers, students, and parents in order to enhance the students' academic achievement (MacNeil et.al, 2009). On the basis of the above view, some factors related to the school management have been described. From the interview and observation of sample schools, the researcher found that there is no proper management in school. There is no proper management of the classroom, desk bench, school ground etc. As well as one subject teacher from a sample school told to the researcher that if anyone teacher is absent in school, then his/her whole class will be leisurely for a whole day. These all are the weakness of administration which makes the school's results weak. It is defective effect on the mathematics achievements of students.

Parents are the backbone of students' study. The education of children does not depend on only the teacher's role but also depend on their parents' awareness interests and knowledge about handling and guiding their children at home. Parents can introduce and teach values depending on their parents' education. From the interview with the subject teacher, respondent students, and principal of the school, it is found that most of the Thangmi student's parents are economically poor. They could not fulfill the necessity of their students. Some of the parents are used to taking alcohol so there is no proper environment to study at home at the evening time. As well most of the Thangmi student's parents are illiterate. They are not educated. So, they are less conscious of their children's studies. Very least numbers of parents are used to coming to school to take their children's progress reports in school. All of about above data

shows that parents-related causes also one of the causes behind the difficulties of Thangmi students in learning mathematics.

Mathematics anxiety is one of the important aspects of the International Journal of Elementary Education 2017 student's related factors in learning mathematics. Math anxiety has been defined as "an inconceivable dread/fear of mathematics that can hamper manipulating numbers and solving mathematical problems within a variety of everyday life and academic situations"(Buckley & Ribordy, 1982, p.1). Mathematics anxiety as a feeling of nervousness, tension and worry which interference the performance of mathematics. It is a negative feeling to the mathematics learning process. When examining students' problems in mathematics anxiety as a feeling of tension, apprehension, or fear that interferes the mathematics performance. It also refers to forgetting and having no confidence in the mathematical subject matter. It directly affects the mathematics learning process of students and de-motivates students in their mathematics learning. From the observation and interview of Thangmi students, the following views have been recorded related to mathematics anxiety. A member of the sample said that mathematics is a very difficult subject, and they're a kind of fear of mathematics and math teachers. It is only for clever and talented students. Similarly, another respondent said that talented students can read and remember the formula of mathematics. It has several formulas that always need to remember for learning mathematics and are difficult to understand. In the line of discussion, one student said that why to read mathematics, especially algebra, ratio and proportion, the bearing of scale, and geometry. These all are abstract education for us. It is being burdened for us and cannot understand anything in these topics so I feel, mathematics is a difficult subject. Another student said that among all subjects; he feels that mathematics is a more boring subject

From the above views of students about the anxiety about mathematics, it indicates that mathematics is a very hard subject to understand and has no relation to other subjects and in our daily life. They feel mathematics is an abstract subject, a formula-based subject, and is unable to convert into concrete form. This anxiety brings a wrong and negative concept in mathematics and de-motivating their learning mathematics. Due to these reasons, there is an irregularity in the mathematics classroom and a high dropout rate in this group of students.

From the observation and interview, the researcher found that still, the teacher is using teacher centered methods, their teaching style is still old fashion, and no teaching material is used during the teaching period even in geometry also the same case is going on, no interaction with students, no group discussion, no any project work has given. They do not relate the content contextual; do not provide any project work-related content with their daily life. The form of teaching style becomes abstract teaching and learning. Students become passive learners and their learning is like parrot learning. In the line of discussion, the researcher found that students are totally based on the teacher. The researcher asked the mathematics teacher about the topic of not using teaching material and the teacher replied that we have no sufficient infrastructure and learning equipment.

Topographical difficulties can be seen as one of the barriers to learning in the context of Nepal. Here, Thangmi is not out of it. Its location is in the hilly region, students have to walk on around one to two hours to reach school. This causes tireless and can't concentrate on learning.

Remedies to overcome causes

The second objective of this research is to explore the strategy for promoting Thangmi students in learning mathematics Education. In the previous section, this study revealed the difficulties and causes of the difficulties of Thangmi students in learning mathematics. In this section, the major ways to reduce the difficulties and strategy for promoting of learning mathematics for Thangmi students have been discussed. The ways of overcoming the difficulties in learning mathematics are generalized on the basis of the data collected through the interview with the subject (mathematics) teachers, students, principals of schools, and other stakeholders. First, we have to understand that if we reduce the causes mentioned above then it will be reducing gradually among Thangmi students. The possible causes of underlying difficulties and teachers' efforts to help students overcome difficulties in learning mathematics. Triangulation of data from three different sources leads to the formulation of the key ways to overcome the difficulties of Thangmi students in learning mathematics.

It has been found that the students have difficulties in basic knowledge of algebra and geometry both. A mathematics teacher from SchoolA said that Thangmi students do not have sufficient basic fundamental knowledge relating to the learning contents. For reducing the difficulties, they should form a habit of practicing on a regular basis. Supported this view, a mathematics teacher from School B said that we have to generate a mathematics practice environment at school as well as aware the students of the importance of mathematics in daily life. Students are afraid of learning mathematics, they panic to ask alternate questions which causes a weak foundation in mathematics (Sources: interview, 2022). Hence, in reducing the difficulties of learning mathematics, mathematics teachers have a vital role. They should make mathematics an easier subject. First, the teacher has to eliminate the fear, and mathematics anxiety from

the students and he/she has to clear the basic fundamental concepts of every concept and create students friendly environment at the mathematics classroom and make an effort of attempting several problems on a daily basis. Students are discouraged from taking up lengthy word problems or tough problems at the outset. Instead, they should start tackling the easy problems and then proceed to the tough ones. This will help them in understanding the basic concepts which are required. Students who practice regularly find it easy to understand the basic facts and concepts.

Thangmi students have difficulties understanding the problems in algebra and geometry. They have no strong foundation or basic concepts. The teachers bring an elaborate understanding of what it means to learn in-depth mathematics. To elaborate on their concept of in-depth learning they compare traditional and modern ways of teaching techniques and argue about how to transition from a conventional mode of instruction to a more student-oriented mode of pedagogy that could be adopted in the mathematics classroom. A principal from SchoolA said that Thangmi students are less laborious, they are always busy with their household activities. For reducing their difficulties in understanding, they have to do more labor on basic concepts. Also, he advised to subject teacher to use the instructional material in the classroom. A subject teacher from the same school opined that if students are regularly present in the classroom, then they can easily understand mathematical problem from anywhere. So, regularity of students at school is one of the major important ways to overcome the difficulties in mathematics (Sources: interview, 2022). Hence, for increasing the understanding of Thangmi students on the skill of manipulation of letters, symbols, or variables, the use of rules of manipulation to solve equations, use of the knowledge of algebraic structure and syntax to form equations, and use and understanding of algebraic notations in the context of the generalization of patterns, teachers have to use

the student's centered methodology as well as sufficient instructional materials. For this, the administration should manage the work environment for teachers as well as administration should enhance the teacher's skills regarding the modern teaching method and instructional materials in the classroom through different training, seminar, and relating programs. Subject teachers also have a responsibility to eliminate the mathematical anxiety from students and make the prior knowledge stronger for a better understanding of future.

Likewise, Thangmi students have difficulties in applying and processing skills of different formulas. Lack of prior knowledge relating to contents, lack of students' labourness, carelessness of the teacher on learning activities, and irregularity of students in the classroom. generate this type of problem in learning mathematics. A mathematics teacher from shreePashupatiKanya Secondary School shared his experience that the teaching method in mathematics is more teacher-centered rather than students centered. For visual learning in mathematics, the mathematics curriculum should focus on daily life-related problems. So, the curriculum should be more practical because students learn the knowledge in school and apply the knowledge in their household work. Then only they can understand and apply the mathematical rule easily. Hence, Mathematics is a subject that demands analytical skills, critical thinking, and logic from students. This helps them in solving any problem they come across in this subject. Furthermore, Math requires the students to have brainstormed whenever they are approaching problems. If we lose focus, we are more likely to get confused when solving problems. Students who focus can easily arrive at the answers without struggling. For developing and applying skills to the students, there should be a suitable environment at school as well as at home to apply the formula which they learn at school. The teacher should also pay more attention and make mathematics funny and

gaming subjects through the instructional materials which can be constructed at the local level.

Analysis of the teachers' perspectives about the ways to overcome the difficulties of Thangmi students in learning mathematics and their reflection on day-to-day teaching experiences explain the meaning the teachers bring to the notion of 'in-depth learning' in mathematics. The teachers seem to bring rather a broad understanding to the notion of in-depth learning, and this understanding in turn seems to influence the way they mediate between students and subject matter knowledge. They consider mathematical learning as a cognitive process rather than an act aimed at memorization of rules. They underscore the need for exposing students to a stimulating learning environment in the early stages to help the evolution of mathematical knowledge.

Analyzing the perspectives of subject teachers, head-teachers, students, and other stakeholders, the difficulties of Thangmi students in learning mathematics can be minimized. Subject teachers have to use modern learning strategies and teaching materials. Use information communication and technology to visualize the abstract nature of contents as far as possible. Motivate the students more on doing rather than knowing. Teachers have to use an approach to learning rather than teaching. Creating a positive learning environment is essential for success in the classroom. Teachers should create a welcoming atmosphere where students feel safe and willing to share. Teacher can play a role as learning mediator; help child take change of his learning. Develop the fundamental concepts of content which are the building block for further learning. There are more other factors related to parents. Parents also can play a vital role in their children's learning. They have to create a suitable environment at home for self-learning and practicing mathematics. A child's learning scale is highly related to how

they are treated at home. Kids would be easily inspired by what their parents do. So, it would be good to be a role model in their learning phase. Parents are a kid's first teachers and so learn the first things together at home. Doing things together with parents gives them a sense of support and confidence. Reading the lessons together is one of the best ways to be close to the child's learning at school. Parents should make sure that the kids are provided with a peaceful and pleasant atmosphere at home. Giving good motivation is important for a kid to perform better in studies.

Similarly, the administration has to pay good attention to increasing the achievement level of students and they have to be ready to take responsibility and accountability for the achievement of Thangmi students in learning mathematics.. For promoting the achievement of learning mathematics, quality education is very essential. To improve the quality of education, the local government needs to solve the problems of fulfilling the basic needs of Thangmi and focus on their learning. So, the progress rate of Thangmi students will increase and promote their achievement level. In this way, Thangmi students promote their achievement in learning mathematics.

Chapter V

Findings, Conclusion, and Implications

This heading contains the major finding and summary of this study. The finding of this research is based on collected data and the summary is an overview of the main points of this thesis. The major finding and summary of this research were described in the following heading.

Finding

This study emphasizes on the promotion of Thangmi students in learning mathematics at the basic level. The objectives of this research are to find the achievement level of students and explore the difficulties of Thangmi students in learning mathematics and explore the strategy for promoting the Thangmi students in learning mathematics Education. This study has been composed on five different chapters.

This research was based on a mixed research approach. It followed the explanatory sequential mixed research method. The researcher conducted an achievement test for quantitative analysis and quantitative data were analyzed through SPSS by calculating the mean, standard deviation, and t-test. Similarly, the data needed for qualitative analysis were collected through interviews with the subject teacher, headteacher, and students. The samples were taken from schools in the Dolakha district of Nepal. The qualitative data were carefully generalized, analyzed, and interpreted by using a thematic network approach design.

From the analysis of data getting from the achievement test, it was found that students have the less mean comparison to the National Assessment of Students Achievement (NASA) 2013. Based on the analysis and interpretation of data, the

finding of this research is presented in the hierarchical order in the heading on major findings.

On the basis of data analysis and interpretation of the results, the major findings of this research are listed below:

- It was found that the average obtained marks of Thangmi students of grade VIII are 8.1750 out of 35 but according to NASA (2013), it was 12.25.
- The range of obtained marks of Thangmi students in achievement tests is found 31 in which the maximum obtained mark is 32 and the least obtained mark is 1.
- The standard deviation of obtained marks of Thangmi students is 6.78946. This shows that there is a large variation and scatter on obtained marks.
- Thangmi students have difficulties on basic fundamental concepts of learning mathematics.
- Thangmi students have difficulties understanding the use of rules of manipulation to solve equations, and lack of understanding of the use of the knowledge of algebraic structure and syntax to form equations.
- Thangmi students have difficulties in Manipulation of operator symbols Procedure.
- Thangmi students have difficulties on transforming the given algebraic word problem and geometrical figural problems into an algebraic expression.
- They have the problems on process skill.
- The students neglected the daily assignments and the teacher did not use to check homework in the daily basis and did not give feedback about homework as well.
- Lack of motivation in the classroom and practical knowledge on mathematics.
- The poor pre-knowledge of students in mathematics, which creates the difficulties on learning mathematics.
- Students are not laborious in mathematics in learning.

- Students suffer from mathematical anxiety.
- Lack of motivation and counseling to the students, they feel mathematics as a very difficult subject.
- Different reasons such as traditional teaching-learning methodology, lack of teaching-learning materials, lack of child-friendly environment, not addressing the need and interests of students, and irregularity of students are taken as the causes of difficulties in learning mathematics.
- Likewise, lack of appropriate physical infrastructure and insufficient time and resources in school can be taken as the causes of difficulties of Thangmi students in learning mathematics.
- Geographical difficulties are the causes behind the difficulties of learning mathematics.
- Peoples surrounding to school are unaccountable to the schools which causes lack of concern for the teacher in teaching-learning activities in mathematics.
- The subject teacher should develop a positive attitude towards mathematics to eliminate mathematical anxiety.
- Develop the skill of manipulation of signs through practice and solving problems.
- Make a suitable environment for in-depth and self-learning for the students.
- Use the student's centered methodology rather than the traditional methodology for learning activities.
- Use information, communication, and technology in teaching and learning activities.
- Focus on learning rather than teaching.
- Focus on doing rather than knowing to eradicate the difficulties on learning mathematics.

Conclusion

This research aims to measure the achievement level of Thangmi students and find the causes and remedies of difficulties in learning mathematics to promote the Thangmi students. The researcher conducted an achievement test among 40 students of sample schools and found that the average achievement score of Thangmi students was less than the average achievement score of NASA, 2013 AD. So, it shows that Thangmi students have learning difficulties in mathematics. To find the major learning difficulties, the researcher has been taken interviews with subject teachers, principals of sample schools, parents, and some selected students with their answer sheets for achievement tests. From the data collected from interviews with different stakeholders, it was found that Thangmi students have difficulties relating the basic concept of contents, they have less knowledge of process skills, manipulation of symbols, and sign skill, they have difficulties in applying skills, and they have insufficient pre-requisite knowledge on relating contents on mathematics.

To eliminate the difficulties of Thangmi students in learning mathematics, Parental involvement makes a really big difference, especially in early childhood. It has been proven to enhance children's academic performance and contribute to their overall success in school. There are many ways for parents to be involved in their children's education. They can help with homework assignments or with issues their children are encountering in the classroom, for example, and they can exert a positive influence on a child's behavior and attitude towards school. We should eradicate the barriers to influencing their learning of mathematics and make mathematics learning enjoyable according to the context which helps to increase the mathematical achievement of Thangmi students as well as other students. The teacher has to use modern technologies in teaching-learning activities in the classroom.

Implications

The following points reveal the implications of this study:

- This study can be used to eliminate the difficulties of Thangmi students in learning mathematics to the teacher and other stakeholders.
- The concerned authority can use to know the present context of Thangmi students on basis of information provided by this report.
- The school administration should interact with the students, teachers, guardians, and other stakeholders to discuss the difficulties and come to a solution.
- Innovative and refreshment training, orientation, and supervision should be provided to the teacher time to time.
- Train the teacher to develop the skill of motivation and encouragement to the students towards learning mathematics.
- Administration and subject teachers can conduct a special program to eliminate the mathematical anxiety from the students.
- Teachers should be encouraged for making and using the teaching materials.
- For recommendation, Thangmi communities are less in Nepal. So, this study should be carried out with a large sample and various schools in different parts of Nepal.
- We can conduct the study on the use of information, communication, and technology (ICT) in Thangmi communities' schools of Nepal.
- We can conduct research work on the drop rate of Thangmi students.

REFERENCES

- Aale, S. (2012). *Mathematics learning difficulties of Magar Children at Primary Level (A Case Study in Sindhuli District)*. Unpublished thesis, T.U. Kathmandu.
- Air, C. B. (2018). *Difficulties in learning mathematics of raute children*. Unpublished thesis, T.U. Kathmandu.
- Akhter, N. & Akhter, N. (2018). *Learning in mathematics: difficulties and perceptions of students*. Educational research, department of Education, Pakistan.
- Bista, D. B. (2004). *People of nepal*. Kathmandu: RatnaPustakBhandar.
- Bohora, D.K. (2008). *A comparative study of mathematics achievement among Chhetri and Tharu students*. T.U., Kirtipur: Unpublished master thesis.
- Bom, K.B. (2009). *Effects of home environment in mathematics learning*. T.U., Kirtipur: Unpublished master thesis.
- Bourdieu, P. (1986). *Cultural capital theory*. Retrieve from <https://www.marxists.org/>
- Buckley, P.A., & Ribordy, S.C. (1982, May). *Mathematics anxiety and the effects of evaluative instructions on math performance*. Paper presented at the Midwestern Psychological Association, Minneapolis, MN.
- Central Bureau of Statistics (2013). *Caste/ethnicity, National Population, and Housing Census-2011*. Kathmandu: Health and Population Ministry.
- Chaulagain, R. (2015). *Difficulties in learning mathematics of Tamang students at primary level*. T.U., Kirtipur: Unpublished master thesis.
- Chinn, S. (2013). *The trouble with maths: A practical guide to helping learners with numeracy difficulties*. Routledge.
- Creswell, J. W. & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed). Sage

- Ghimire, S. (2013). *Difficulties of Bote students in learning mathematics*. Unpublished master thesis, T.U., Kirtipur.
- Johnson, R. B. and Onwuegbuzie, A. J. (2004). *Mixed methods research: A research paradigm whose time has come*. *Educational Researcher*, 33(7), 14-26.
- Kullar, p. (2011), *A multi-side case study. The effect of principal leadership on school climate and student achievement in charter schools in Los Angeles*, Pepperdine University, CA.
- Lagne, T. (2009). *Difficulties, meaning, and marginalization in mathematics learning as seen through children's eyes*. Ph.D. thesis in Mathematics Education. The international doctoral school of Engineering, Science and Medicine: technology and science, Department of education, learning and philosophy, Aalborg University.
- MacNeil, A.J., Prater, D.L., and Busch, S. (2009), "The effects of school culture and climate on students achievement", *International journal of leadership in education*, Vol. 12, No. 1, pp. 73-84.
- Morse, J. M. & Niehaus, L. (2016). *Mixed method design: principles and procedures*. routledge, Taylor and Francis Group, London and New York.
- Ogbu, J.U. (1992). *Cultural discontinuity and schooling in anthropology and education quarterly*. Vol.13. No.4 P(168-190).
- Ogbu, J.U. (2001). *Understanding cultural diversity and learning*. In broadly, a.u. Levinson, et al. (eds) *schooling and symbolic animal*, P(190-126).
- Rijal, C. P. (2008). *Difficulties in learning mathematics: A case study of Rana Tharu students in Kanchanpur district*. Unpublished master thesis, T.U., Kirtipur.

- Sapkota, G. R. (2012). *A comparative study on secondary school mathematics achievement of Baramu and Gurung students in Gorkha district*. T.U., Kirtipur: Unpublished master thesis.
- Shrestha, P. (2016). *Cultural diversity and difficulty in learning mathematics*. Unpublished thesis of master's degree, T.U, Kirtipur.
- Tashakkori, A. & Teddlie, C. (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks: Sage.
- Yadav, B.K. (2008). *Causes of low achievement in mathematics*. T.U., Kirtipur: Unpublished master thesis.

Appendices

Appendix:A

Mean and s.d. on Achievement Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
x	40	8.1750	6.78946	1.07351

T-test of Mean on Achievement Test

One-Sample Test

	Test Value = 12.25					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
x	-3.796	39	.001	-4.07500	-6.2464	-1.9036

Appendix: B**P-Value and D-Value of Achievement Test**

	Student's roll numbers															R	P-value	D-Value	
S.N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
Qn																			
1	1	1	1	1	0	1	1	0	0	1	1	1	1	0	0	10	66.66666667	0.5	
2	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	11	73.33333333	0	
3	1	1	0	1	0	0	1	1	0	1	1	0	0	1	0	8	53.33333333	0.5	
4	1	0	0	0	1	1	1	1	1	1	0	1	1	0	0	9	60	0	
5	1	1	1	0	0	1	0	1	0	1	1	1	0	0	1	9	60	0.25	
6	1	1	1	1	1	1	0	1	0	1	0	1	0	0	0	9	60	0.75	
7	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	12	80	0.25	
8	1	1	1	0	1	1	0	0	0	0	1	1	1	0	0	8	53.33333333	0.25	
9	1	1	0	1	0	0	1	0	1	1	0	0	0	0	0	6	40	0.75	
10	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	5	33.33333333	0.25	
11	1	1	1	0	1	1	0	1	1	1	1	1	0	1	0	11	73.33333333	0.25	
12	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	12	80	0.5	
13	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	11	73.33333333	0.5	
14	0	1	1	1	1	1	0	0	1	1	0	1	1	0	0	9	60	0.25	
15	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	13	86.66666667	-0.25	
16	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	12	80	0.5	
17	1	1	1	1	0	1	1	1	1	0	0	1	0	0	0	9	60	0.75	
18	0	1	1	1	0	1	1	1	1	1	1	1	1	0	0	11	73.33333333	0.25	
19	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0	9	60	0.25	
20	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	10	66.66666667	1	
21	1	1	1	0	1	0	0	1	1	0	1	1	0	0	0	8	53.33333333	0.5	
22	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	10	66.66666667	0	
23	0	1	1	1	0	1	0	0	0	1	1	1	0	0	0	7	46.66666667	0.5	
24	1	1	0	1	0	1	1	0	0	1	1	1	1	0	0	9	60	0.25	
25	1	1	1	1	0	1	0	1	0	1	1	0	1	0	1	10	66.66666667	0.5	
26	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0	11	73.33333333	0.25	

27	1	1	1	0	0	1	0	0	1	0	1	1	0	1	0	8	53.33333333	0.25
28	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	3	20	0.25
29	1	1	0	0	1	1	1	1	0	1	1	0	0	0	0	8	53.33333333	0.5
30	1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	10	66.66666667	0.75
31	1	1	1	1	0	1	0	1	1	1	0	0	1	0	0	9	60	0.75
32	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	12	80	0
33	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	4	26.66666667	-0.25
34	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	10	66.66666667	1
35	0	1	1	1	0	1	0	0	0	1	1	1	0	0	0	7	46.66666667	0.5
36	1	1	0	1	0	1	1	0	0	1	1	1	1	0	0	9	60	0.25
37	1	1	1	1	0	1	0	1	0	1	1	0	1	0	1	10	66.66666667	0.5
38	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0	11	73.33333333	0.25
39	0	1	0	1	1	0	1	1	0	1	0	1	0	0	0	7	46.66666667	0.25
40	1	1	0	1	1	0	0	1	1	0	0	0	1	1	0	8	53.33333333	0.5
																		Where, R=No. of Correct answer

Appendix: CMarks obtained by **Thangmi** students on achievement test

Marks obtained by students			
	Full marks=35		
Roll no.	Marks		
1	17		
2	7		
3	6		
4	11		
5	14		
6	13		
7	12		
8	22		
9	9		
10	7		
11	6		
12	6		
13	1		
14	1		
15	3		
16	4		
17	5		
18	18		
19	3		
20	10		
21	8		
22	9		
23	12		
24	11		
25	9		
26	2		

27	6		
28	5		
29	6		
30	9		
31	23		
32	32		
33	5		
34	2		
35	1		
36	2		
37	1		
38	1		
39	5		
40	3		

Sum

327

Mean

8.175

Appendix: D

Achievement test at the basic level for students

Student's Name:.....

Date:.....

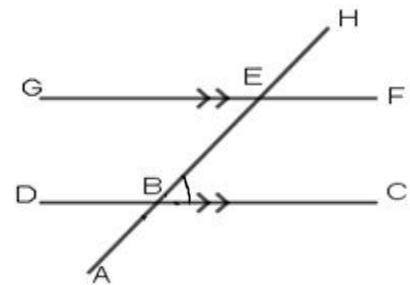
School's Name:.....

Gender:.....

Attempt all the questions.

1. Write a pair of co-interior angles of $\angle BEG$.

- $\angle BEG$ sf] sf]Of n]Vg'xf]; . _



2. Write any two features of the parallelogram.

-;dfgfGt/ rt{'e'hsf] b'O{ j6f u'0fx? n]Vg'xf];.-_

3. What is the supplementary angle of 130° ?

- 30° sf] ;dk'/s sf]Of slt x'G5 <_

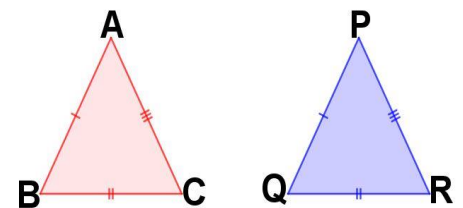
4. What is the sum of interior angles of the triangle?

-lqe'gsf] leqLsf]0fx?sf] of]ukmnslt x'G5 <_

5. By which axiom the ΔABC and ΔPQR are congruent to each other?

($\Delta ABC / \Delta PQR$ lqe'hx? s'g tYoaf6 ;d?k x'G5g\<_

Solution:



6. What is the formula to find the area of circle?

-j[Qsf] lf]qkmnlgsfNg] ;'q s] xf] <_

7. Draw the net of cube.

-3gsf] hfnLagfpg'xf];\ . _

8. Write the formula to find the distance between two points (x_1, y_1) and (x_2, y_2) .

-ljGb'x? $(x_1, y_1) / (x_2, y_2)$ lrsf] b'/L lgsfNg] ;'q n]Vg'xf]; . _

9. What is the image of point $P(x, y)$ under reflection about a line $y = -x$?

-ljGb' $P(x, y)$ nfO{ /]vfy=xdf k/fjt{g ubf{ aGg] k|ltlaDa s] x'G5 <_

10. What is the range of given data? 50, 46, 23, 54, 9, 34, 39

-lbOPsf] tYof^{\sssf] lj:tf/ kQfnufpg'xf]; \ . _ 50, 46, 23, 54, 9, 34, 39.

11. What is the solution point of given lines?

-lbOPsf] /]vfx?sf] ;dfwfgljGb' s] x'G5 <_

12. Plot a point A(-1,3) in the given graph.

- ljGb' A(-1,3) nfO{ lbOPsf] u]fkmdfeg'xf]; . _

13. Find the HCF -d=; lgsfNg'xf]; . _: $(x + y)^2, x^2 + 2xy + y^2$ and $(x + y)$

14. Harka has a piece of square land with length is 35 m. Find the perimeter of that

land. - xs{;Fu 35mnDafOePsf] Pp6f juf{sf/ hldg 5 eg] pQmhldgsf]

kl/ldltlgsfNg'xf]; . _

15. Color the intersection part of the sets A and B in the given figure.

-lbOPsf] ;d"xx? A /B aLrsf] k|lt5]lbtufdf 5fof kfg'xf]; . _

16. If $n(U)=60$ and $n(A \cup B) = 45$, find the value of $n(\overline{A \cup B})$.

-olbn(U)=60 / $n(A \cup B) = 45$ eP $n(\overline{A \cup B})$ sf] dfg kQf nufpg'xf]; \ . _

17. What is the square root of the number $\frac{49}{81}$?

- $\frac{49}{81}$ sf] ju{d"n slt x'G5 <_

18. Find the L.C.M. of 24 and 36.

-24 / 36n=; lgsfNg'xf]; \ . _

19. From a piece of bread, Ram ate $\frac{2}{3}$. Find the remaining part of bread.

-/fdn] Pp6f kfp/f]6Lsf] $\frac{2}{3}$ efu vfof] eg] p;n] vfg afFsL efu slt x'G5 < lgsfNg'xf]; \ . _

20. Ram bought a pen in Rs. 50 and sold to Hari at Rs. 60. Find the profit parentage.

-/fdn] Pp6f snd ?= 50dfIsGof / ?= 60df x/LnfO{ a]Rof] eg] p;sf]

gfkmfk|ltztlgsfNg'xf]; . _

21. What would be the value of $x^2 \times x^{-2}$?

$(x^2 \times x^{-2})$ sf] dfg slt x'g'kb{5 <_

22. What is the formula of $(a + b)^2$?

$(a - b)^2$ sf] ;'q s] x'G5 <)

23. Find the value -dfgkQfnufpg'xf]; . _: $(+3)x(-3)$

24. Find the value $(-100) \div (-20)$
25. Express in mathematical form: "4 is multiplied in the addition of 5 and 6."
 $4 \times (5 + 6)$
26. Write the given number into scientific notation: 3450000000
 3.45×10^9
27. If you are going to buy a watch, the mark price of a watch is Rs.5000, and shopkeeper offers 20% discount, what is the discount amount of a watch?
 $Rs. 5000 \times \frac{20}{100} = Rs. 1000$
28. Construct an angle of 45° by using pencil compass .
29. Convert into percentage $\frac{1}{4}$
30. Write the formula to find the simple interest.
 $S.I = \frac{P \times R \times T}{100}$
31. If 30% of the total students were absent in a class, how much percentage of students was present in a class?
 $100\% - 30\% = 70\%$
32. Find the ratio of 2 kg and 14 kg.
 $\frac{2}{14} = \frac{1}{7}$
33. Write the formula to find the perimeter of circle.
 $P = 2\pi r$
34. Simplify $\frac{x^2 - y^2}{x + y}$
35. Solve $x^2 - 16 = 0$

Appendix-E

Interview Guideline for Students

Student's Name:..... Date:.....

School's Name:..... Gender:.....

The researcher has asked the Thangmi students to get the information about the following relevant topics:

*Note: First, I discussed to respondent about on his achievement test's answer sheet. Then to find causes of difficulties, the following questions were discussed:

1. Do you ever ask the questions to your teacher?
2. How does your teacher response on your questions?
3. Does your teacher describe the problem individually?
4. Do you get help to solve mathematical problem from your subject teacher?
5. Does your teacher provide regular homework? If so, do you do your homework regularly?
6. Does your teacher check the homework or not?
7. Do you complete your classwork on time?
8. Does your teacher explain on your language?
9. Do you feel difficult to understand Nepali language?
10. How long time do you get to read at home?
11. Do your parents say to engage household and other field work?
12. Do you ever take any tuition, coaching classes?
13. What problem do you feel frequently experience in mathematics class?
 - Difficult on subject matter
 - Partial behavior of your teacher
14. Do your parents help you to do your task at home?
15. Do your parents encourage you to study?
16. Measures to overcome the difficulties on learning mathematics.

Appendix-F

Interview Guideline for Teachers (Subject and Head Teacher)

Name:..... Gender:.....

Qualification:..... Training:.....

School's Name:.....

The researcher has asked following relevant questions to get the information from the teachers.

1. Do Thangmi students come at school regularly?
2. Do they used to ask the questions at classroom?
3. Do they do their homework and classwork regularly?
4. Do they have basic concepts about mathematical contents on class five?
5. Have you ever used instructional materials in teaching learning process?
6. What types of teaching methodology do you use?
7. Does school provide the sufficient teaching materials for teaching learning process?
8. Reference books, teaching materials and teacher guide are available or not?
9. What types of difficulties do the Thangmi students face in teaching learning process?
10. Do the parents visit the school to know about their children's study?
11. How do Thangmi students behave and interest to learn in classroom?
12. Do you have interacted to Thangmi students on their interest, difficulties, problems and needs?
13. What are the causes behind the difficulties of Thangmi students?
14. How do the difficulties can overcome?
15. Do the subject teacher use the teaching materials on learning mathematics?
16. Are they responsible on Thangmi student's achievement?
17. Have the administration conducted any program to the regularity of Thangmi students?

Appendix-G
Interview Guideline for parents

The researcher has asked following relevant questions to get the information from parents.

1. Economic condition
2. Child's interest
3. Environment at home for learning
4. Reading/Practicing opportunities at home
5. Difficulties of children on learning mathematics
6. Causes behind the difficulties
7. Suggestion to promote on achievement of Thangmi students

Appendix-H

Classroom Observation

The researcher has observed the classroom under the following criteria.

1. Teaching methodology
2. Instructional materials used in classroom
3. Use of information communication and technology (ICT)
4. Classroom environment
5. Focus on Thangmi students
6. Students' concentration on learning activities
7. Communication of students to teacher
8. Use of reinforcement