

**DIFFICULTIES OF CHEPANG STUDENTS IN LEARNING
MATHEMATICS**

**A
THESIS
BY
NABIN DEVKOTA**

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

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LETTER OF CERTIFICATE

This is to certify that **Mr. Nabin Devkota**, student of academic year **2073/075** with campus Roll No: 377, Exam Roll No: 7328406 and T.U. Registration No: **9-2-559-38-2011** has completed his thesis under supervision of Mr. Krishna Prasad Adhikari during the period prescribed by the rules and regulations of Tribhuvan University, Nepal. The thesis entitled **Difficulties of Chepang Students in Learning Mathematics** has been prepared based on the results of his investigation conducted during the period of November 2019 to December 2020 under the Department of Mathematics Education, University Campus, Tribhuvan University, Kirtipur, Kathmandu. His thesis number is **1535**. I recommend and forward his thesis for the evaluation as the partial requirements to award the Degree of Master of Education.

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Prof. Dr. Bed Raj Acharya

Head, Department of Mathematics Education

Date:- 1st January 2021



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LETTER OF APPROVAL

This thesis entitled "**Difficulties of Chepang Students in Learning Mathematics**" submitted by **Mr. Nabin Devkota** in partial fulfillment of the requirement for the Master's Degree in Mathematics Education has approved.

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RECOMMENDATION FOR ACCEPTANCE

This is to certify that **Mr. Nabin Devkota** has completed his M.Ed. thesis entitled "**Difficulties of Chepang Students in Learning Mathematics**" under my supervision during the period prescribed the rules and regulation of Tribhuvan University, Kirtipur, Kathmandu, Nepal. The study embodies the result of investigation conducting during the period of 2019-2020 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 Prasad Adhikari

Supervisor

Date:- 13th December 2020

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DEDICATION

This work is heartily dedicated to my respected parents Thakur Prasad Devkota, Gayatri Devkota, spouse Kabita Chundali and all family members whose support, love, care and sacrifices made me a person who I am now.

DECLARATION

This thesis does not contain any others 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.

.....

Nabin Devkota

January, 2021

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.....
Nabin Devkota

ABSTRACT

This study entitled “Difficulties of Chepang students in learning mathematics” intended to find out the difficulties of Chepang’s students on learning mathematics. The objectives of study were to find the learning achievement of Chepang students at primary level, to explore their difficulties in learning mathematics and to find the causes and to explore the ways to overcome the difficulties in learning mathematics.

To fulfill above objective the researcher conducted achievement test with interview schedule and class observation form to collect the required information. The researcher used the explanatory sequential mixed research design. Quantitative data were analyzed by the statistical tools and qualitative data were analyzed by thematic network approach of analysis. Researcher selected five sample schools from Chitwan district by purposive sampling. Fifty students were selected for achievement test. Similarly mathematics teachers, head teachers, parents were also included in interview. The researcher analyzed the collected data with the help of conceptual understanding on the basis of problems related to learning environment at home and school, pre-knowledge of the students.

The finding of the study shows that, there are lots of difficulties of Chepang students on learning mathematics. Chepang students have faced the difficulties on fundamental concepts of learning mathematics, use of the knowledge of algebraic structure and syntax to form equations, manipulation of operator symbols procedure, transformation of word problems into algebraic expression, process skill, application of concepts, formulas and theories in the new context, pre- requisite knowledge. Besides these, local Chepang community are not accountable towards the schools which causes lack of concern of the teacher in teaching learning activities in mathematics, early marriage, language, poor economic status of parents and geographical difficulties are the causes behind the difficulties of learning mathematics specially to Chepang students.

ABBREVIATIONS

ATA	: The Alberta Teachers' Association
CASLT	: Canadian Association of Second Language Teachers
CERID	: Research Centre for Educational Innovation and Development
HDI	: Human Development Index
ICME	: International Congress on Mathematical Education
ICT	: Information Communication and Technology
NASA	: National Assessment of Students Achievement
NCA	: Nepal Chepang Association
NGO	: Non-Government Organization
SEE	: Secondary Education Examination
SES	: Socioeconomic Status
TU	: Tribhuvan University
UN	: United Nation
US	: United States

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CHAPTER I

INTRODUCTION

This is the study on difficulties of Chepang students in learning mathematics. This introductory part includes the background of the study, statement of the problem, rationale of the study, objectives of the study, research questions, significance of the study, delimitations of the study and definition of the key terms.

Background of the Study

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

Education as a system can be called the brain of any society and it is 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 the present time it is the way of learning by social interaction. Traditional education refers to the mainstream educational environment not designated as alternative. Either in traditional or in modern eras, mathematics is the fundamental subject for all streams.

Mathematics is a vast adventure in ideas, an exact science and truly saying the mirror of civilization. According to Perry, mathematical education began because it was useful, it continues because of the usefulness of its results. The history of teaching mathematics is as old as the human civilization. The history of mathematics is a powerful tool for disseminating an understanding of mathematics. The history of mathematics teaching in Nepal started with the starting of " Gurukula" in ancient period whereas the modern education system in Nepal seems to follow the world's educational system (Jha, 2006). "Mathematics for all" is the main theme of ICME VI. To make this slogan significant, every people should be mathematically literate. But many research shows that mathematics is considered as a difficult subject and most of the students fear to mathematics. "Mathematics is the gate and key to all sciences".

(Bacon) emphasizes its importance and use in many fields, it has a closed relationship to human life and is related to many social subjects population, economic, sociology, physics, chemistry, management etc. so, mathematics should be so easy that everyone can easily learn it.

Mathematics is the subject that has significant impacts on people. Every people need mathematics to solve the 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 the social science (Bell, 2008). As a school subject, mathematics has a tremendous authority. Having difficulty with mathematics is a serious issue. Successes of failures in mathematics in school has a deceive influence on the choice of further education and carrier both with regarded to access and necessarily self-confidence. Mathematical skills and competency are very importance to make life social and easier. Just like mother tong competency, mathematics is associated with a 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 the both the child's perceptions of their own capacity to manage the challenges of schooling and to their future education and life (Lange, 2009).

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 in many careers. Thus, negative attitudes among students may have important ramifications for career choices and contributions in wider society (Akhter, 2018).

Nepal is a multi-ethnic country, in which Chepang are one of them. The Chepang are an indigenous Tibeto-Burman ethnic group mainly inhabiting the rugged ridges of the Mahabharat mountain range of central Nepal. The Chepang population totals around 50,000 (0.23% of Nepal's population) 4and is scattered mainly across the districts of Chitwan (40%), Makwanpur (29%), Dhading (20%) and Gorkha (5%) (U.N., 2012). Their main language is named as Chepang but is called Chyo-bang by the people themselves. These people are also called "Praja" meaning "political subjects". The people speak 3 different dialects of this Tibeto-

Burman language that is closely related to Raute and Raji, two undocumented languages spoken in western Nepal. Chepang language is one of the few languages which use a duodecimal (base 12) counting system rather than the decimal (base 10). The Chepangs themselves follow Animism, although they are strongly influenced by both Hinduism and Buddhism, which came from the Tamangs just north of them. Chepang are one of the most vulnerable communities of Nepal standing very low in Human Development Index (HDI). The Chepang, one of Nepal's most disadvantaged and marginalized indigenous groups, are struggling to educate their children. Land ownership is rare and most will work as agricultural laborers or forest. The Chitwan branch of the Nepal Chepang Association (NCA), an NGO formed by Chepang rights activists, says the literacy rate is barely 23 percent among the close to 90,000 Chepangs in 54 VDCs - in Chitwan, Dhading, Gorkha, Makwanpur, Lamjung and Tanahu districts - against a national average of 40 percent, according to Nepal's Central Bureau of Statistics. Most Chepang are subsistence farmers, living from hand to mouth, and depend on the region's two annual harvests, each lasting three months. Over 80 percent are under the poverty line, which means they survive on less than US\$1 per day, the NCA reported (UN, 2012).

Mathematics is an essential part of school curriculum of Nepal. It has been shown as compulsory subject at all level of school education program. Mathematics is also included as optional subject at 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 afraid of it. The result of SEE examination shows that most of the failures were in mathematics. In the context of Nepal, People used to say that mathematics is the so hard subject, it can be studied and learned by only gifted children. Higher level of mathematics can study and learn by male then female, girls cannot study mathematics, mathematics as the male subject etc. are the traditional and narrow thinking about mathematics. So, this type of conception on the context of Nepal makes mathematics as difficult subjects. On the other hand, Nepal government's developed different plan and implement it to the local level to make the mathematics as best as a more practical and daily usual subject. But, due to different technical reasons, the programs which are conducted by Nepal government form the central level are not effective and it cannot able to make mathematics as a practical

and easier behavioral subject. Due to multi-ethnicity of our country, there are many more difficulties in learning mathematics in school level's mathematics.

Most of the research found that the reasons behind the difficulties in learning mathematics in school's level but there was not discovered a unique and best way to eliminate the mathematics difficulties in school level. Learning to think mathematically by making the abstract concrete for learners is an integral step in math education (Bista, 2004). From the sources of difficulties in mathematics may be defined in terms of output difficulties, organizational difficulties, language difficulties, attention difficulties, visual spatial difficulties or ordering difficulties, difficulties in multiple task, and difficulties in cognitive process. However in these learning difficulties in mathematics refers to those outputs in mathematics problem data related to recall basic mathematics fact, procedures, rules, formula, to retrieving fact or pursue procedure to difficulty in mathematics précising during mathematical work and to difficulties in remembering previously encounter patterns to convert verbal problems in mathematics way and difficult in inert-relation between content and principle (Lagne, 2009).

Statement of the Problem

This study was mainly concerned about the mathematics learning difficulties of Chepang students, causes behind the difficulties and investigating the ways of overcoming from the difficulties on learning mathematics. So, this study discussed about the learning difficulties which are faced by the Chepang students. To improve the condition, this study was analyzed the difficulties in learning mathematics of Chepang in primary level in term of their achievement of mathematics, cultural effect on learning, learning opportunities, classroom social dynamics, curriculums and language using in learning mathematics.

The researcher was close to Chepang community and in contact to different teachers who were teaching Chepang children, researcher used to hear lots of complains regarding their learning difficulties of mathematics. Such incidents drew the attention of researcher to have research on the very unique issue in which researcher could study overall factors affecting learning mathematics. So, researcher chooses this topic as his research study.

This study was conducted the achievement test of Chepang students and was analyzed under the reason behind the difficulties of learning mathematics in primary level's students, particular in class five. Previously, research were conducted on the low achievement of Chepang 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 Chepang students are the indigenous ethnic group of Nepal; they may have many more reasons such as lack of local teacher, lack of use of suitable learning strategy, lack prior knowledge in relating contents, lack of motivation, less laboriousness, mathematics anxiety. They have their own cultural background. They used to speak by using their own language, they have a low economic status, so they may have problem in communication, and they may have a problem on the text book which is designed on the basis of central student's necessity. The researcher intended to find out the difficulties which are facing by the Chepang Students and its causes and ways of measures to overcome difficulties in learning mathematics in relation to different perspective which are influencing on learning mathematics at primary level.

Rationale of the Study

Mathematics is a fundamental part of human thought and logic, and integral to attempts at understanding the world and ourselves. Mathematics provides an effective way of building mental discipline and encourages logical reasoning and mental rigor. In addition, mathematical knowledge plays a crucial role in understanding the contents of other school subjects such as science, social studies, and even music and art. In contemporary education, mathematics education is the practice of teaching and learning mathematics, along with the associated scholarly research. Mathematics has got a prominent place in school curriculum for its practical value. It has been taken as the compulsory subject at the school level and elective discipline on the higher level. It is used in every discipline of study. So, its significance has been increasing day by day.

Every student comes in classroom with their own cultural background. They too have mathematical concept more or less associated with their culture aspect. In context of Nepal, Nepali language is introduced as the official language. It is used as the medium of instruction in all school and the national curriculum, which, sometimes has been problematic for learning to those who have different mother tongues. Impact of cultural difference in children's learning and school due to unmatched condition of

learning strategies of children and learning style of the teacher seen to be a researchable problem.

In this research the learning difficulties being faced by the mathematics students and teachers will be the main focuses of the study. Therefore, this study has provided some logical and valuable information about the current problem of mathematics difficulties with the following significance.

- This study is very helpful to identify achievement level and knowledge level in mathematics of Chepang Students.
- This study is very helpful to identify the learning difficulties of Chepang students in learning mathematics.
- This study is helpful to find and solve learning difficulties of Chepang students in learning mathematics.
- This study helps for increase the learning activities of Chepang students in mathematics.
- It is useful to make the inclusive classroom teaching.
- This study sets up the implementation of mathematics curriculum in the present context and may provide base ground for the further researchers in this issue.
- This is useful for Chepang community, parents, teachers and students and other stakeholders for conducting related program in future.

Research Objectives

The set out what we hope to achieve at the end of the project are taken as objectives of the study. Objectives are basic tools that underline all planning and strategic activities. The following were the main objectives of the study:

- To find out the learning achievement of Chepang students at primary level.
- To explore the difficulties of Chepang students in learning mathematics.
- To find the causes and to explore the ways to overcome the difficulties in learning mathematics.

Research Questions

They are the set of questions which indicate direction of inquiry in research. It is a fundamental core of a study. So, to complete this study, following question were taken as research questions:

- What is the level of achievement of students in mathematical concepts at primary level?
- What type of learning difficulties do Chepang students have in learning mathematics?
- How do Chepang students overcome the learning difficulties?

Delimitations of the Study

The delimitation of this study are as follows:

- The research was delimited to five schools Shree Rastriya Adharbhut School Deujar, Shree Rastriya Ma.Vi Chaturmukhi and Rastriya Adharbhut School Nibuwatar, Shree Aadharbhut Bidhyalaya Chhapedhap and Shree Dakshinkali Aadharbhut Bidhyalaya of Chitwan district.
- This study has included only class V students from selected schools, so the finding cannot be generalized elsewhere.

Operational Definition of Key Terms

Chepang. One of Nepal's most disadvantaged and marginalized indigenous groups who inhabit the rugged ridges of the Mahabharat mountain range of central Nepal.

Students. Students are the Chepang Students who are studying in sample schools at class V.

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 by Chepang students.

Achievement. In this study, achievement means the score obtained by the Chepang students at primary level.

Learning Difficulties. In this study, difficulties in learning mathematics is obstacles of Chepang students in learning mathematics

Environment. It indicates home environments and school environments of Chepang students in learning mathematics.

CHAPTER II

REVIEW OF RELATED LITERATURE

Review of related literature is an essential part of the research. 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 in relation to the research problem being investigated. The purpose of a literature review is to provide foundation of knowledge on topic, identify areas of prior scholarship to prevent duplication and give credit to other researchers. Identify inconsistencies: gaps in research, conflicts in previous studies, open questions left from other research. The literature review is important because it describes how the proposed research is related to prior research. It shows the originality and relevance of our research problem. By reading many different studies, we begin to gain an impression about the importance aspects of the topic, identify data sources that other researcher has used, identify and become familiar with style of writing that is used particularly within the ethos of the area that we are researching, identify ideas for further consideration and create our own reading and critiquing strategy.

There are two types of literature review which are empirical literature review and theoretical literature review. Empirical literature review deals with original research (such as scientific experiments, surveys and research studies). Researches based on experience and observation, rather than on systematic logic. Those theories which can be used for analysis and interpretation of data are reviewed on theoretical review of literature.

So, researcher has collected the different unpublished thesis, some books, journals, articles, researches which are related to cultural diversity and difficulty. By deep study of these reports, researcher has reviewed the following literature as academic writing.

Empirical Literature

Air (2018) did a study entitled in “Difficulties in Learning Mathematics of Raute Children” for the partial fulfilment 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 primary level and find the causes of difficulties in learning mathematics. This study adopted qualitative research design which followed case study design with 4 Raute children 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 “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 language used by students, lack of local teachers, lack of secret room and lack of practice are the major reasons to create main difficulties in learning mathematics for Raute students. Due to above presented reasons students’ enrolment at school and in mathematics decreases. The researcher concluded that government should employ Rautes for increment of their economic status and conduct a home awareness program and provide the extra class to Raute students to build the base of mathematics, make classroom cultural friendly to decrease the gap between the research problem and objectives of research.

Kandel (2017) conducted a study entitled “Difficulties of Darai Students in Learning Mathematics” for the partial fulfilment of the requirements for the degree of master of education, under the department of mathematics education. The objectives of this study were to identify causes of difficulties and strategies to address the causes of difficulties of Darai students in learning mathematics at secondary level. This research adopted the qualitative in design with case study approach. Researcher took 18 participants as a sample size of research which was taken by using purposive sampling. The research tools of this study were classroom observation forms, interview guidelines to students, unstructured interview with subject teacher and parents were taken to get data. Thus, the study found that home and school environment are not similar for the mathematics learning of Darai students, Darai have their own traditional values, language, they are culturally dominated, parents involve their children in labour, Darai students have low physical facilities and materials, most of parents are uneducated, lack of proper interaction between teacher and students, lack of parents’ attention of their children education, lack of students’ centered learning method and lack of inter-relationship between other caste students

as the major causes of difficulties of Darai students in learning mathematics. Researcher concluded that we should have to ensure child friendly environment, proving a awareness program and scholarship, provide proper guide and motivation, make proper attention of parents to their children's study to maintain the gap of the research problems and objectives.

Shrestha (2016) conducted a study entitled on "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 qualitative research design with ethnography research approach. The research tools used on this study were observation, in-depth interview and documents analysis. He selected eight students as sample of this study in government school of Kathmandu district on the basis of purposive sampling. The study found that there is a cultural diversity in classroom. The culturally diverse students have many difficulties in learning mathematics. Pupil's weak perception on mathematics, lack of culture friendly curricular materials, mathematics anxiety, traditional teaching and learning methods, socio-economic status of family, and discrimination in 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, strategy and used cooperative learning in mathematics learning. Also, he concluded that mathematics teaching and learning ways from the schooling is not good. Existing school mathematics teaching learning practices seem failing to address social and cultural need of the students.

Chaulagain (2015) did a study on 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 Primary level. The researcher selected five Tamang children as a sample of this study by using the purposive sampling approach. He used in-depth

interview, observation as tools of this study. By this study, the researcher found that the cultural discontinuity, language difference, lack of interpersonal relationship, low economic condition, unfavorable school environment, lack of local teacher etc. are the main causes of learning difficulties for Tamang students in mathematics. He concluded that teacher should have to use the practical method in teaching and use of local teacher for learning mathematics.

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

Dhami (2012) conducted a study entitled on “Impact of socio-economic status on mathematics achievement of Tharu students” 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 out the relationship between socio-economics status in mathematics achievement of Tharu students. An achievement test paper was the main instrument including questionnaire from for parents and students. The students were chosen sample random approach. The

researcher concluded that mathematics achievement of Tharu students found to be positively correlated with father's education.

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 with respect to school culture. The researcher adopted a purposive sampling to collect data. The tools of the research were interview schedule, observation form. Researcher used the theory of John Ogbu to interpret the information and to get the conclusion. From this study, the researcher found that the cultural discontinuity, language, culture practices, interpersonal relation, low economic condition, unfavorable school environment for the different cultural group, students, teachers, learning opportunity 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. Researcher concluded that on relating cultural practice of the students and learning management in the school to promote learning in mathematics.

Joshi (2011), conducted a study entitled on "Learning Difficulties in Mathematics, A Case Study of Open School Students" 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 arithmetic for open school students. This research followed the qualitative research design. The researcher had taken four respondents from Kathmandu district. The researcher collected and analyzed the data through In-depth interview and observation as tools. The major finding of this research was lack of curriculum and instructional materials, lack of supportive environment, less interaction and lack of quality of instruction and lack of practice and fast forgetting are the learning difficulties in learning mathematics.

Dahal(2011) did a research entitled on "Causes of Low Achievement in Mathematics of Magar Students" in Kaski 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 explore the causes that bring low achievement in mathematics and identify the strategies taken by school in improving mathematics achievement of Magar students. The tools of this research were interview schedule, observation, field documents. This research followed the qualitative research design. This study found that most of magar parents were illiterate and they used their children as a means of earning to support their family, mostly use of teacher centered methods, busy on household work, lack of motivation, the teacher used to give homework daily but students were facing the problem in delay of checking the copies and language were the causes of lows achievement in mathematics of magar students. The researcher concluded that parent illiterate; language is the one of the obstacle for students. So, this study recommended that there should be the provision of teaching mathematics to the students of primary level in their mother tongue as well as Nepali language.

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 case study approach used. The research tools of this study were observation form, In-depth interview schedule. The finding of this study shows that there is a cultural difference and discontinuity at school and home. There is discontinuity because of language, lack of interpersonal relation, no proper interaction between teacher and students. The home environment and school environment are not conducive for mathematics learning.

Adhikari(2006) did a study entitled on “Cultural Discontinuity and Difficulties in Learning Mathematics of Dalit students”. The Objectives of this study were to identify the causes of difficulties in learning mathematics at school, influencing factors in learning mathematics, impact of home environment. This research did by taking four Dalit students as a sample of the study. The researcher was used in-depth interview, observation and written documents as research tools. This study found that there is a discontinuity between home culture and school culture and home environment is not supportive for mathematics learning.

CERID (1990) studied entitled on “Elementary Process of Learning Mathematical Concept and Process of Rasuwa Tamang”. The purpose of this study were to identify the basic mathematical concepts used by Tamang adult with no formal mathematics education, to identify traditional Tamangs method of mathematical operation and to find out the implication of Tamang process and tone up to the present learning situation. That project work has shown that the Tamang have their own mathematical processes and geometrical concept. The study had also showed that the situation of children into the formal system. But it did not study the effect of ethno-mathematics practices in the classroom practice.

After studying the overall literature, the researchers have found more problems related to teaching and learning mathematics. They have come to the different results and conclusions. Most of the researchers have focused on methodology and instructional materials which are not getting sufficient result as the information. So, the researcher studies on genetic, environmental and overall aspect of Chepang students in learning mathematics. Therefore, determining the gap and decide to find out the solution of the student difficulties in learning mathematics has 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 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. It is important for teachers 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 Chepang childrens’ studying in early grade of basic school vanish this so a brief of underlay of than theory is discussed here. Cultural discontinuity can be defined as disconnections and inconsistencies between school-based norms and values and those of some students, often from no dominant cultures. 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 about 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 with the system that may result better learning achievement. Similarly, the children with unmatched and dissimilar home cultures with school cultures cannot easily adjust and cope on the school's learning environment. As a result, they have a more difficulties on learning in 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 implementation of their curriculum, using their language as the only means of instruction of learning. Regarding cultural difference, identity and school learning, he has put the example on the case of the United States of America.

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

Ogbu's theory has generated considerable research, commentary and criticism. Criticisms include 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 style. He wrote that they did not address

community forces that foster avoidance of hard work. He recommended that school implement minority achievement programs that reform community forces to support academic achievement. Such 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 have implication to this study is related to cultural discontinuity and learning difficulties in mathematics of Chepang students who also disadvantages group in term of culture of discrimination, domination and background form mainstream. Mainly, Chepang children hesitated to interact to other children as well as to the teacher in the school and as well as on the community. As well as, Chepang have low economic status, because of that their children used to go school very rarely.

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 cultural deprivation theory, cultural capital theory does not see working class culture as inferior, or lacking in any way, it just sees it as different to middle class culture. Instead of blaming working class underachievement on flawed working-class culture, 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 are able to 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 own 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 which middle class children are

more likely to be exposed to compare to working class children. Middle class culture is also the dominant culture in most schools, and schools place 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, they don’t need to do anything else other than be themselves in order to belong and thrive at school (Bourdieu, 1977).

One important (and easy to understand) aspect of 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).

The most importance reasons as children with different cultural world and human relation in school but they get a vast difference reality in school. Nest lack of necessary concepts and skills in their own cultures may obstacle their learning. Finally, difference in teaching styles and learning strategies may be an important reason that affects their learning. As the present research question is considered, it is helpful in finding the learning difficulties in Chepang students. Necessary information collected form the observation of Chepang behavior in classroom, school, and community and inquired about the children to their parents, carried by in-depth observation and interview and their cultural aspects that contribute to their school.

Conceptual Framework

The conceptual framework is the researcher understands of how particular variables in his study connect with each other. It is an analytical tool with several variations and contexts. It identifies the variables requires in 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).

This research determined objectives that to identify the learning difficulties of Chepang students in learning mathematics at primary level students. This research

mainly based upon the cultural discontinuity and difference theory. The given below conceptual framework is proposed on the effective learning procedures to develop the new knowledge for Chepang students.

Very few researchers have been carried out on the difficulties of Chepang students in Learning Mathematics in mixed (Qualitative and Quantitative Design) paradigm. The following figure tries to show the structure of this thesis. It includes the research design, tools, theory on which it stands and different variables which determine on the difficulties of Chepang students on learning mathematics. It also clears about the procedures and structure which used for finding the ways to overcome the difficulties on learning mathematics. Then finding, conclusion and implications have been shown respectively

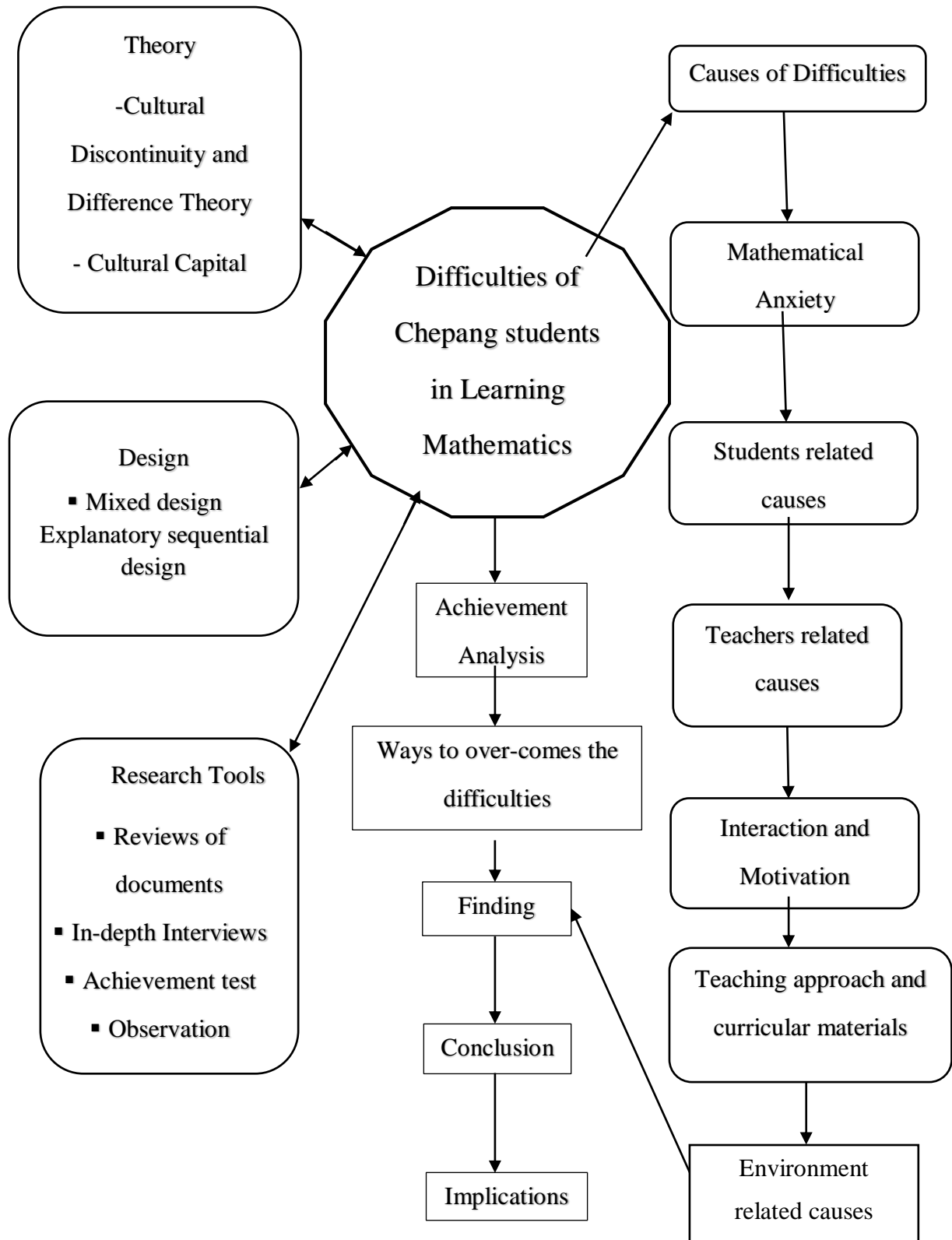


Figure 1

Conceptual Framework of the Study

Implication of the Review for the Research

Literature review is the essential component for the research work. The review of the literature suggests that what types of research had been done on the same field in which the researcher is going to conduct the research work. It also helps to the researcher to find the recommendations for the further research. Review provides ideas for what types of research can be done in better way as well as it helps to researcher for stating the problem of his/her research topic. It describes how the proposed research is related to prior research in statistics. It shows the originality and relevance of our research problem. Specifically, our research is different from other statisticians. It justifies our proposed methodology. It demonstrates our preparedness to complete the research. It identifies the relationship of works in context of its contribution to the topic and to other works.

For the completion of this research, researcher reviewed the different literatures and theories which gave an idea for the further research this topic. It helped to find the research gap as the marginalized communities' students have the less achievement in primary level comparison to different standard test of the country and it makes better to state the problem relating to presented topic to the researcher. It provides a foundation of knowledge on topic identifies areas of prior scholarship to prevent duplication and give credit to other researchers, Identifies inconstancies: gaps in research, conflicts in previous studies, open questions left from other research, identify need for additional research (justifying this research) for the research. The review provides guidance in 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 the better research design, research tools and helped to the ideas for interpretation and analyzing the collected data from different sources.

CHAPTER III

METHODS AND PROCEDURES

This chapter describes how the study was conducted to obtain the objectives of this study. It determines how the research becomes complete and systematic. The methods were apply in this study are discussed in the following sections: Research design, methodology, study area, sources of data, population of study, sample population and sampling procedures, data collection procedures, data analysis and interpretation procedures and ethical considerations.

Research Design

Research design refers to the definite procedure and technique which guide to study and provide ways for research viability. It is arrangement for collection and analysis of data. A plan of study or blue print for study that presents a series of guide posts to enable the researcher to progress in the right direction in order to achieve the goal is called a research design or strategy.

Researcher has set the goal to study the achievement level of students. On the basis of analysis of data taken from achievement test, research has objectives to find the difficulties, causes and ways to overcome from learning difficulties. Therefore, this study is based on mixed research approach with explanatory sequential design. This design consists of two distinct phases: quantitative followed by qualitative (Creswell et al. 2007). The qualitative (text) data was collected and analyzed in the second phase in order to explain, or elaborate, the quantitative results obtained in the first phase. The rational 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. In quantitative research design, researcher decided to follow the survey research approach for finding the mathematical concept and knowledge level of mathematics of Chepang students and researcher used the qualitative research approach to find causes behind the difficulties on mathematics learning. After finding the causes of difficulties on learning mathematics of Chepang students, researcher explained the ways of overcoming the difficulties of learning mathematics through the data which were collected from the interview with

students, subject (mathematics) teachers, head teachers and other stakeholders. The research design which was used on this study is described below.

Explanatory sequential approach. Mixed methodology is the corner stone 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).

Tashakkori & Teddlie (2003) identify three different approaches to mixed methodology; these being concurrent, sequential and conversion. This study undertakes the sequential approach where the quantitative phase (numbers) is followed by the qualitative phase (personal experience) (Creswell, 2013); where the qualitative findings are used to contextualize the quantitative data (Creswell, Plano-Clark, Gutmann & Hanson, 2003). Qualitative data can also enhance and enrich the findings (Taylor & Trumbull, 2005; Mason, 2006) and, help generate new knowledge (Stange, 2006). By this approach, researcher used the following phases for finding the conclusion and summary of this study:

Phase I collects, analyses and evaluates quantitative data; phase II involved arranging, undertaking interviews, analyzing and evaluating the qualitative data and qualitative data contextualizes the quantitative findings.

Population

The target population of this research was taken as the Chepang students studying at primary level all over Nepal. The objectives of this study were to find the learning difficulties of Chepang students. So, the population of Chepang students all over Nepal was taken as the population of this research.

Sampling Procedure

Sampling procedure is a process or technique of choosing a sub-group from a population to participate in the study; it is the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large

group from which they were selected (Ogula, 2005). So, sampling procedure contains sample size, study site, participation, and sampling strategy which are described below.

Sample size. Sample is the representative portion of research population. Researcher took 50 students of primary level from the Chepang community schools. All students were taken for an achievement test for the quantitative data and out of them 10 students were taken to get the data for qualitative approach. Those students who were taken for collection of qualitative data have weak performance and achievement in achievement test.

Sample site. The sample of this study was taken from the primary level's students from class V in Chitwan district from five different schools. The research was delimited to five schools Shree Rastriya Adharbhut School Deujar, Shree Rastriya Ma.Vi Chaturmukhi and Rastriya Adharbhut School Nibuwatar, Shree Aadharbhut Bidhyalaya Chhepedhap and Shree Dakshinkali Aadharbhut Bidhyalaya of Chitwan district.

Sampling strategy. It is a way of choosing or selecting a sample from the large number of population. Researcher were used the purposive sampling procedure to bring out the data in quantitative approach and on the basis of the performance on achievement test ten students were selected by simple random sampling for qualitative design. This strategy of sampling helps to me to find out the appropriate information and data, so this strategy is better than other on this research.

Data Collection Tools

Anything that can be used as the means of collecting the information for research study is called a research tool or research instrument. For example, observation forms, interview schedules, questionnaires, and interview guides. Research tools enable researchers and modelers to construct theories and system models.

This research was guided by explanatory sequential design. Researcher has used achievement test for the collection of quantitative data and in-depth interview, document analysis, field visit and observation for the collection of qualitative data.

Achievement test. An achievement test is designed to measure a person's level of knowledge, skill in a specific area. This tool helps to find the achievement level of Chepang students in mathematics. It was developed to acquire data regarding the achievement test was required. Unfortunately, there was no standardized achievement test developed and finalized for grade V mathematics in Nepal, which can serve the purpose of this research work. So, researcher has developed achievement test tool (Appendix E). The procedures of developing 'achievement test tool' are discussed below.

Development process of achievement test. On the basis of national goals of class five mathematics on curriculum, the achievement test was constructed. It has covered major area of class V mathematics prescribed by mathematics textbook of curriculum development centre: arithmetic, mensuration, sets, algebra and geometry. Furthermore, it has covered three domains of Bloom's Taxonomy: cognitive, affective and psychomotor. A specification chart was developed after examining and evaluating present curriculum, content and lessons in prescribed textbooks in order to determine the content validity (Appendix-A). Being based on the above mentioned parameters and researcher constructed achievement test tools. Achievement test was helpful to find the difficulties in learning mathematics of Chepang students.

The difficulty level of test paper was tested through pilot test on 12 students. It was intended further improvement in the test paper. To calculate the difficulty level of the items, researcher used the mathematical procedure. In which, researcher has calculated the difficulty index-p according to Ronald Fisher method. He has generalized the following formula;

$$P = \frac{R}{T} \times 100\%$$

where, P= Difficulty index of the item

R= Number of examinee who gave correct answer

T= Total number of examinee

Similarly, researcher has calculated the discrimination index according to Ebel and Frisbie, 1991. They generalized the following formula;

$$D = \frac{RU - RL}{T/2}$$

where, D= Discrimination Index

RU= above 27% student's correct answer numbers

RL= below 27% student's correct answer numbers

T = Total students numbers below and above 27%

From the item analysis, it helps in selecting the best items for final test, reject poor items and modify some of them (Bajracharya, 2007). It was decided that the two items Question no. 10 and Question no. 15 will be eliminated. Because Q.no.10 has p-value 0%, so it can't able to measure the achievement level of students as well as Q.no. 15 has 100% p-value, so it can't able to measure the level of knowledge of students (Appendix-B). In this way, 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 test and measuring instruments (Sharma, 2000, p.222). For the reliability of achievement test, the question numbers of test has been divided into two sections on the basis of even and odd numbers of questions. By using split half method of reliability test, the reliability coefficient (correlation coefficient) with the help of Pearson's formula, it is found that 0.552 which is substantial (Garret, 2008, p.176). It shows that the test has a substantial consistency.

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

The data which was obtained by achievement test helped the researcher to analysis about the level wise (knowledge, understanding, application) knowledge of students in primary level.

In-depth interview. In- depth Interview is the process of data collection from face to face interaction with respondents. Interview is the two way interaction between interviewer and interviewee in which interviewer creates situations that can attract the attention of respondents for an enough period of time in asking questions and answering the questions which interviewee puts his/her understanding and

meaning (Karki, 2017). In depth interview has been taken because this research has studied about socio-cultural aspects and environment of school and home.

Researcher prepared interview guidelines including open-ended topics based on research document, objectives of the study, suggestion from supervisor of this study and according to the situation of environment. Then researcher met the teachers, students and parents individually. Researcher made them clear about the purpose of this research and importance of their help. The interview has been taken them with consent letters, rapport building, and semi-structural questions with tail questions. In-depth interview with subject teachers, head teachers, other stakeholders were more helpful to find out the ways to overcome the difficulties on mathematics learning of Chepang students.

Observation. Observation is the action or process of carefully watching someone or something (Collins English Dictionary).

Observation is one of the most important techniques in the qualitative research to collect the information. It usually consists of detailed notation of behaviors, events and the context surrounding the event and behaviors.

In order to do observation researcher visited the school environment, classroom environment, home environment, local community, and students' activities after school. Data getting from observation has used on qualitative analysis. From observation researcher has found the answer of those questions which he did not get from the achievement and interview. Observation was more helpful to find out the difficulties and ways to overcome the difficulties on mathematics learning of Chepang students.

Documents analysis. Document analysis is a systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008; Rapley, 2007).

For the study of the history of Chepang students, documents such as students' record, attendance register and marks ledgers have been analyzed which helped to know about the background, level of students in lower classes. Document

analysis were more helpful to obtain the data for analyzing and exploring the student's difficulties on learning mathematics and it also helped researcher to find the causes of difficulties.

Quality Standards

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; Lohr, 2004; Shavelson & Towne, 2002).

In research quality standard are required to check the data.

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, many doubts occur during and after the research process. Often researchers question the credibility of collected data and whether enough evidence is gathered to support the claims, or even determine if the accumulated results should be published. These doubts may be minimized through the aspect of trustworthiness. Reporting of the process and the results of quantitative and qualitative data collection and analysis is the key to justifying and assuring that trustworthiness exists in the study. Trustworthiness has four key components: credibility, transferability, dependability, and conformability. (IHRCS, 2016)

Credibility. Credibility is the first aspect, or criterion, that must be established. It is seen as the most important aspect or criterion in establishing trustworthiness. This is because credibility essentially asks the researcher to clearly 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). Here we focus on the two most important techniques (triangulation and member checking), since these will be the ones we find most often in qualitative research. In this research the teachers, respondents students were the peoples representing the school on Chepang community.

Triangulation is something that every qualitative researcher should be familiar with. Triangulation involves using multiple methods, data sources, observers, or theories in order to gain a more complete understanding of the phenomenon being studied. In this study, the researcher has used in-depth interview, observation and document analysis. Through the information taken from different tools, researcher has come in conclusion of this study. This research involved utilizing different data collection methods in order to check the consistency of the findings.

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 generalizes study findings and attempts to apply them 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.

To maintain the transferability researcher has taken sample by using purposive sampling procedure and included the photos of achievement test and records of all the activities done during the research. Research has also taken guidance and suggestions from the experts.

Dependability. Dependability means the stability of findings over time. Dependability involves participants' evaluation of the findings, interpretation and recommendations of the study such that all are supported by the data as received from participants of the study. (Kortjens & Moser ,2018).

Researcher has taken peer review. To maintain the dependability researcher has given clear information about the study. Research has also taken guidance and suggestions from the experts.

Conformability. Conformability means the degree to which the findings of the research study could be confirmed by other researchers. 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).

Source of Data

In this research, researcher used both primary and secondary data.

Primary data. This is a data which the researcher collects first hand raw data. This data was collected by using the above mention tools of research. Primary data which was obtained by above mention tools helped me to analyze the level of mathematics knowledge of students in primary level. It was useful to find the causes of difficulties on learning mathematics. Similarly, data collected through the interview, observation were taken as the primary data.

Secondary data. The data which was published on newspaper, journals etc. about Chepang students learning was taken as the sources of secondary data of this research. The recorded file, results, school's documents, school's article, journal was used as a source of secondary data. These data were helpful to find the measure to overcome the difficulties on learning mathematics of Chepang students. It provided information about the history of Chepang students on learning mathematics on the past years.

Data Collection Procedures

It is a way of collecting data. Initially, researcher visited five different schools in Chitwan district in which Chepang communities are located. Researcher visited five schools of Chitwan district. Researcher has taken permission from administrators and teachers by rapport building. Researcher has shared all about this study and taken a permission to conduct a test for testing the achievement of Chepang students. Next, researcher took the achievement test of Chepang students in different five schools, he visited locality of school for studying and getting a data about their ethnicity. After getting marks on achievement test, researcher chooses ten Chepang students from the achievement test on the basis of their low performance. Researcher has taken interview to the head teachers, teachers, parents and students for the qualitative study. Finally, researcher was thankful to administration, teacher, students, and parents and to all who helped on study for their kind support and help. Researcher created an environment that he could call and get the information whenever he needs information from the stakeholder.

Data Analysis and Interpretation Procedures

Data analysis method includes both qualitative and quantitative procedures. Quantitative method used different statistical tools such as mean, standard deviation and t-test for analysis of data and qualitative method was organized, transcribed and given coding the data and build theme and compared and described the data comparatively. Qualitative data was analyzed by using thematic network analysis approach. Thematic analysis is a qualitative data analysis procedure where, the researcher should construct a theme of the collected data. In this procedure, the data has been collected, coded and themed systematically. Therefore, in this section systematically collected data has been presented, analyzed and interpreted. The data has been transcribed and the main ideas have been picked up. It is called coding. With the help of codes and general themes have been derived and analytically analyzed. At last, researcher has written conclusion and implication of this study.

Ethical Considerations

This study was conducted for the academic purpose while collecting data, ethical considerations was ensured for the primary data privacy. With regarding this study, researcher was clearly informed his objectives to respondents. He did not use the data for other purpose except his research.

CHAPTER IV

RESULTS 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 measure. In this course of analysis, data gathered from various sources have been inserted in the tabular form. The research finding are interpreted, explained and presented with regards to the objectives specified for the study.

The data were collected from 50 Chepang students by using achievement test, interview with sample respondents including ten students, two subject teachers and principal from three sample schools. The result of achievement has compared to standardized test National Assessment of Students Achievement (NASA).

Quantitative Data Analysis

In this topic, necessary information, data are collected in numerical form. For the quantitative data analysis, achievement test has been taken. Achievement test consists the different questions from the different domain of objectives. The collected data has been analyzed by using the descriptive data analysis tools.

Result on achievement test. Achievement test is a test of developed skill or knowledge. The most common type of achievement tests are 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 Chepang students, achievement test has been taken. The test has full marks 30 among 30 numbers of questions from the different domains of objectives. After testing achievement test among fifty Chepang students of class V, the following result has been derived.

Table no. 4.1

Mean and s.d. on Achievement Test

Variable	N	Mean	Range	Std. Deviation	Std. Error Mean
X	50	9.0600	19	4.27336	0.60434

From the table no. 4.1, researcher found that the average obtained marks of Chepang students of grade V is 9.06. According to the National Assessment of Students Achievement (NASA) 2015 for grade V, national level of achievement in mathematics average is 14.4. The average obtained marks of Chepang students are less than by 4.8 than by NASA, 2015. Similarly, the range of obtained marks of Chepang's students in achievement test is found 19 in which the maximum obtained mark is 21 and the least obtained mark is 2. The standard deviation of obtained marks of Chepang's students is 4.27336. This shows that there is a large variation and scatter of marks of Chepang students. From this, we can conclude that there must be different reasons behind the low achievement level of Chepang students in learning mathematics in grade v.

Table no. 4.2

T-test of Mean on Achievement Test

	Test Value = 14.4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
	-8.836	49	0.000	-5.34000	-6.5545	-4.1255

Table no. 4.2 shows t-value -8.836 and p value $0.0000 < 0.05$ implies there is significance difference between the mean achievement of Chepang students and national achievement of students in mathematics. Behind the less than average marks

of Chepang students, there might have different affecting factors. So, under this test researcher assured that there are different factors, difficulties in learning mathematics to Chepang students. They have suffered from diverse reasons of difficulty in learning mathematics.

Students' Difficulties in Learning Mathematics

This topic shows that what types of difficulties are being faced by the Chepang students in learning mathematics in class V. It illustrates the scope of difficulties such as difficulties related to geometry, algebra. After analyzing the collected data, information and answer sheet of sample students of Chepang students, the following scope and area were identified on difficulties in learning mathematics.

- Difficulties in algebraic knowledge and skill
- Difficulties in geometrical knowledge and skill

The following causes were identified behind the difficulties of Chepang students in learning mathematics through interview with mathematics teachers, head teachers from the different sample schools of this study:

- Lack of prior knowledge on Chepang students
- Mathematical anxiety on Chepang students
- Learning Environment of at home of Chepang students
- Learning Environment of school of Chepang students
- Lack of motivation and counseling of Chepang students

Specially, this study focused on the difficulties of students in learning process. For this, researcher has taken in-depth interview to the respondents, subject teachers and head teachers of sample schools. So, the data which were gathered by qualitative procedure and described them into following headings.

Qualitative Data Analysis

This qualitative research uses the method of design research (Cobb & Gravemijer, 2008) where observations and registration of mathematical activity by the participant observer are the prime sources of data. This topic has explained the difficulties of Chepang students in learning mathematics. It contains the difficulties and causes of difficulties in learning mathematics.

Difficulties in algebra. 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 manipulation of operators symbol procedure, difficulties in transformation, difficulties in applying skill, difficulties in process skill and difficulties in encoding were identified the major obstacles of Chepang students in learning mathematics .

Respondent A

In this study, researcher interviewed a respondent A. He is studying in class five in Rastriya Aadharbhut School, Deujar. He is the son of Bal Badhur Chepang and Sila Chepang. Bal Badhur has two sons in which he is younger. Researcher made a questionnaire for him to understand his difficulties better regarding the very nominal concept of algebra which believes a fifth grade must understand very well.

Difficulties in basic knowledge. Knowledge is the first level of cognitive domain of the 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 specification of this instructional objective. For testing the basic knowledge which are determined by the primary goals of mathematics. Researcher has asked the different questions from the different level 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 concise the very minor concepts constituting the subject. In the achievement test, a question testing the value of 'x' on 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 told that he had never seen this type of problems. He does not know the basic fundamental concepts of equation. So, he left this problem while solving.

From the solution of question no.20

20. Simplify(सरल कर): $25 - [8 + \{3 \times (5-2)\}]$
 $= 25 - [8 + \{3 \times (5-2)\}]$
 $= 25 - [8 + \{3 \times 3\}]$
 $= 25 - [8 + 9]$
 $= 25 - 17$

Figure 2

Basic Knowledge on BODMAS Rule

For solving the problem mentioned in question no. 20, students should have basic concepts of simplifications and laws of addition and subtractions. So, from the answer given by respondent and his perception known from the interview, we can conclude that the respondent has the difficulties on the basic knowledge of rule of simplification and BODMAS rule.

Furthermore, a question on finding the value of 'x' was asked to him, his answer is shown on figure 3.

26. Find the value of x
 (x को मान निकाल):

$2x = 4$
 ~~$x = 2$~~

Figure 3

Basic Concept on Variable and Constant

After analyzing his response getting from his answer sheet on question no.26 and interviewed, researcher came to conclusion that he does not have the idea about a

term 'variable' and a 'constant' terms of mathematics and does not understand the law of addition, subtraction, multiplication and division which are most essential for the solution. He has a problem to know the concept of variable and constant term. He doesn't know the meaning of 'variable'. Similarly, on the question no. 30 which is a verbal ability question, he left it blank.

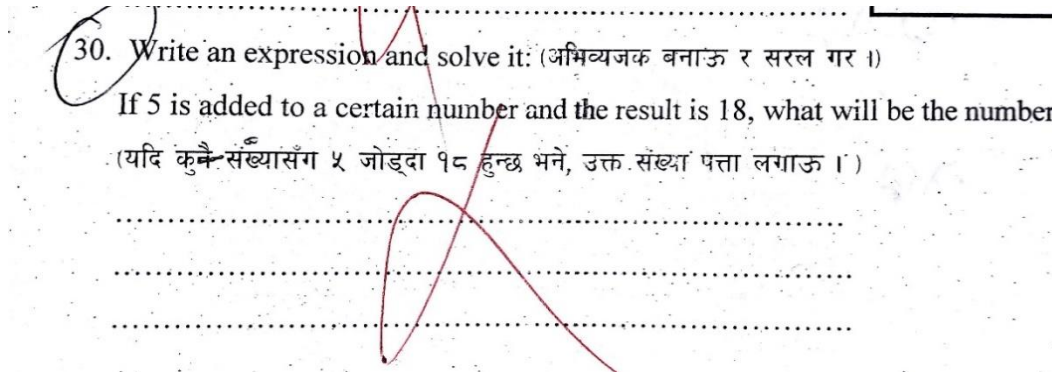


Figure 4

Basic Knowledge on Word Problems

To solve this problem, students must understand the problem to make a mathematical form. In addition, students must understand the concept of variable meaning too. Researcher asked him why he left this question. He answered that he does not know how to construct an algebraic expression and solve it. Researcher asked some fundamental ideas which are basically used to solve verbal ability problem regarding this question no. 30. Researcher found that he does not have any idea regarding this question and does not know which topic / chapter the question belongs to. Similarly, in question no. 7

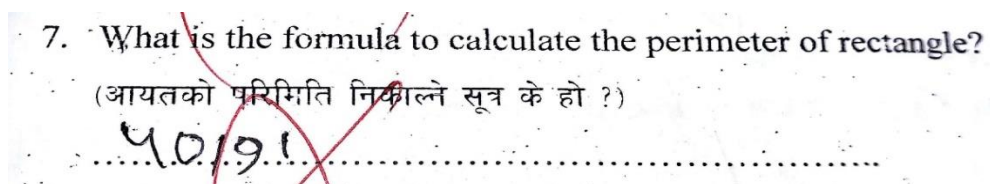


Figure 5

Basic Knowledge on Perimeter

Respondent 'A' wrote the wrong solution. Researcher asked him what the perimeter of rectangle mean but he was confused on the meaning of perimeter and area of rectangle. Form this, the researcher came in conclusion that he does not know the concept of perimeter and area. Hence, he has the difficulties on the basic concept of perimeter and area of plane figures.

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

In addition, we conclude from the question no. 20 and 26 he does not pay attention to the plus minus multiplication and division sign and meaning of plus minus sign. This problem is also the form of operating problem simplifying the algebraic form. So, common difficulties faced by him in this domain are lack of clarity while solving basic equations, 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.

Difficulties in 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. On question no. 20, respondent A has same problem. 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 translation of word problems. Difficulties in transformation refer to problems on transforming the word problem into algebraic expression. Solving word problems is the main difficulties 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 on making expression of respondent A. Solution of question numbers 27 and 30 are given on figure 6.

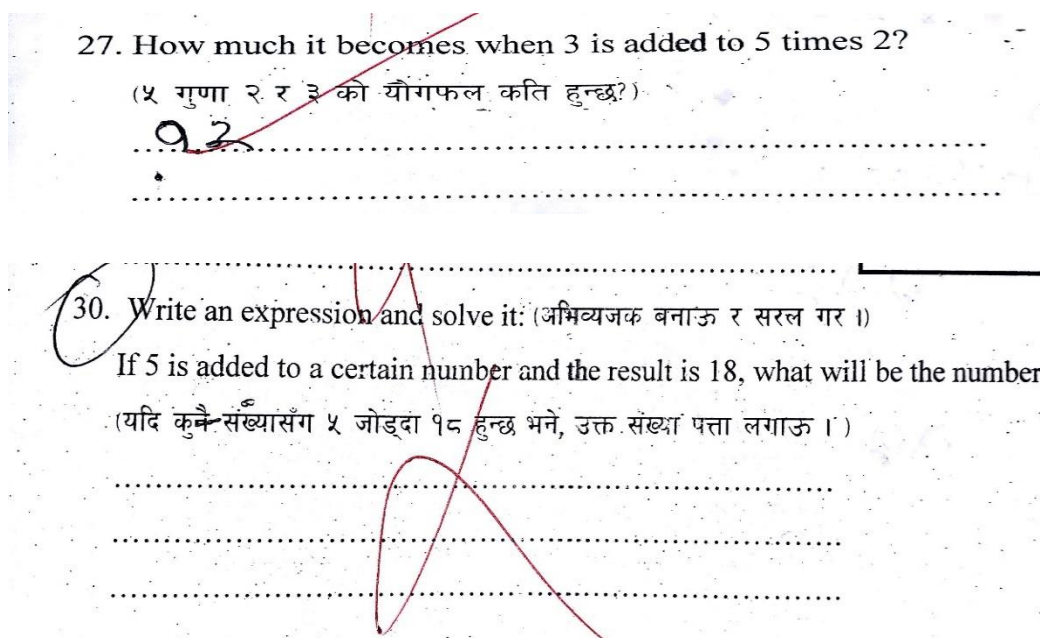


Figure 6

Understanding on Word Problems

Based on the results of analysis in Figure 5, this difficulty refers to the difficulty of transforming information in the form of mathematical symbol into visual

representation needed to solve the problem. In question item 27, respondent 'A' has written directly its result as 13, he was not able to translate the given word problem into algebraic expression. He has to transform the given information in the form of algebraic expression. Interesting findings of respondent A is difficulties were also found during process of transforming language into symbol and vice versa. In transforming language into symbol, 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, 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 transformation of given verbal problem is another difficulties of respondent in learning algebra.

Difficulties in applying skill. Application is the third level of the Bloom's taxonomy pyramid. Applying is using the strategies, concepts, principles, formulas and theories in the new context and situations. The application level is where the student moves beyond basic comprehension in order to begin to apply what they have learned. Students are expected to use concepts or tools they have learned in new situations in order to show that they can use what they have learned in increasingly complex ways. For measuring the difficulties in skill of applying rule in algebra, the questions no. 14, 22 and 23 have asked. But his solutions for the both tasks were wrong.

14. If length and breadth of rectangle are 'a cm' and 'b cm' respectively, write the formula to calculate its perimeter.

(यदि आयतको लम्बाई र चौडाई क्रमशः 'a cm' र 'b cm' भए यसको परिमिति निकाल्ने सूत्र लेख ।)

$2(a+b)$

22. What will be the area of square having length 8cm?

(८ से. मि लम्बाई भएको वर्गको क्षेत्रफल कति हुन्छ ?)

64

23. Find the Area of rectangle with length 5cm and breadth 3cm.

(५ से.मी लम्बाई र ३ से.मी चौडाई भएको आयतको क्षेत्रफल पत्ता लगाऊ ।)

15

Figure 7

Applying Skill on Perimeter of Rectangle

I asked him that the reasons behind misconceptions and difficulties on these problems. He described in dilemma to apply the formulas to calculate the area and perimeter of rectangle and square in different context. He accepted that he has the difficulties that the applying strategies, concepts, formulas and theories in the new context.

Difficulties in process skill. A good learner always gives the priority in the process skill while solving the mathematical problems. Difficulties in process skill are shown by students' error in doing mathematical operations, inability to do sequence of operations, or inability to explain the process of operations.

20. Simplify(सरल कर): $25 - [8 + \{3 \times (5-2)\}]$

$= 25 - [8 + \{3 \times (5-2)\}]$

$= 25 - [8 + \{3 \times 3\}]$

$= 25 - [8 + 9]$

$= 25 - 17$

~~$= 25 - [8 + \{3 \times 3\}]$~~

~~$= 25 - [8 + 9]$~~

~~$= 25 - 17$~~

Figure 8

Process Skill on Simplification

Based on the results of analysis in displayed in figure 8 and interview to respondent A, he has the difficulties in process skill.

Figure 8 shows that respondent 'A' makes mistakes in the calculation process so that he couldnot continue the calculation process performed. In addition, other findings indicate that he does not understand the problem so he does not explain the calculation process. The results of interview indicate that he was confused while doing the calculation stepwise. If we have given questions related to properties of operations with integers, he will not able to solve them accurately. Therefore, he faced difficulties in process skill due to low comprehension and process skill in calculation. The results of interview demonstrate that he made an error in this part because it was difficult for him to make a correct procedure. So, he has difficulties finding what parts to look for to obtain the right answer.

Difficulties in encoding. Difficulties in encoding occurred when, despite being able to solve the question, he failed to interpret the answer in accordance with the context, wrote incorrect answers, or even did not write the answers at all. Majority students have the difficulties in encoding. Based on the results of analysis in presented in Figure 9, respondent 'A' has the same difficulties.

10. What number is multiplied to convert the fraction into percentage?
(भिन्नलाई प्रतिशतमा लैजान कुन संख्याले गुणा गर्नुपर्छ ?)
~~3126999396~~ 100

18. List the prime numbers from 1-20.
(१ देखि २० सम्मका रुढ संख्याहरू लेख ।)
~~3126999396~~

19. What is the prime factorization of 12?
(१२ का रुढ खण्डिकरण गर ।)
~~2 x 2 x 3 = 72~~
2/6

Figure 9

Encoding Skill on Word problems

Above figure 9 is an example of respondent A's answers when solving the question number 10, 18 and number 19. He solves the question number 19. However, Figure 7 shows that the conclusion he drew was not in accordance with the question. Question number 10 asks what number is multiplied to convert the fraction into percentage. He knows that a number 100 should be multiplied to the fraction to convert it into percentage. But he does not know that how can we write the answer of this question in accordance with the context. Thus, in conclusion drawing, he failed to write the proper and acceptable form of answer. In other words, he was not able to interpret the answer accordance with the question's requirement. He has to successfully execute the mathematical processes in order to solve the question, but he often fails to solve the problems according to the questions' requirement.

Difficulties in geometry. 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 which 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 which may not wholly be represented on a plane surface. This

topic includes the different difficulties in geometry such as in basic knowledge, understanding, operator using on geometry, applying skill, process skill and encoding.

Respondent B

In this study, I interviewed a respondent B. She has been studying in class five in Rastriya Aadharbhut School, Deujar. She is the daughter of Saran Chepang and Rajkumari Chepang. Saran has three children in his family. Among them she is the elder daughter. researcher made a questionnaire for her better understanding his difficulties regarding the very nominal concept of geometry which researcher believe a fifth grade must understand very well.

Difficulties in basic knowledge. To develop fundamental linguistic and mathematical skills is one of the major goal of national education at primary level of Nepal. It has also the goal to develop minimum required mathematical knowledge, skill and attitude to solve the problems that arise while carrying out daily activities even for students who drop out school after completing grade five and develop necessary mathematical knowledge and skills needed as the foundation for lower secondary level i.e. grade 6 after completing grade 5. Particularly, at primary level students should able to classify and name the following objects on the basis of their geometrical features (shape, type, angle, measurement) and also explore other geometrical features with measurements.

Knowledge level includes the ability of students to recall and remember the information learned in the classrooms. Recall and recognition are the specification of this instructional objective. For testing the basic knowledge which are determined by the primary goals of mathematics. Researcher has asked the different questions from the different level of objectives of knowledge. From the respondent 'B', the following difficulties in basic knowledge of geometry are generalized:

By analyzing her solution on question numbers 2 and 3, she was not able to give the name of triangle whose all angles are less than 90 degree. She was not able to write the answer of question number 3. Researcher asked a questionnaire for the better understand her concept on triangle and its types which it must know by the students who are studying in class five. Researcher asked the different types of triangles but she was not able to write its type. On the question numbers 2 and 3, what she has written is given in the figure 10.

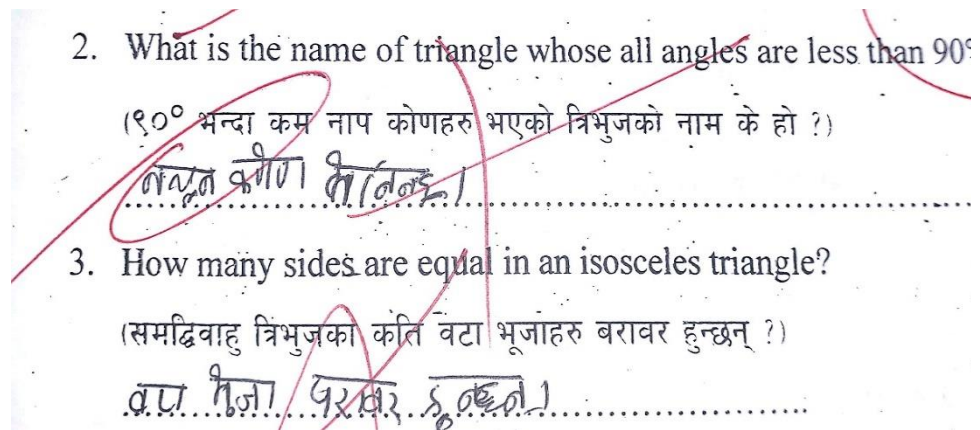


Figure 10

Basic Knowledge on Triangle

From answer provided on figure no.10 and interviewed taken to her, we conclude that she has the difficulties on the basic concepts about triangles and its types. So this type of difficulties is related to the difficulties on basic concept in geometry.

Again, on the answers given by her and interviewed after taken from her, researcher is cleared that she was not able to solve the minor problems of geometry. In an achievement test, she didn't solve any type of problems from geometry. Even she did not try to solve the question, she left it blanks. Further detail, a question on finding a measurement of unknown interior angle of triangle was asked on question number 17, what she has done is shown in the figure 11.

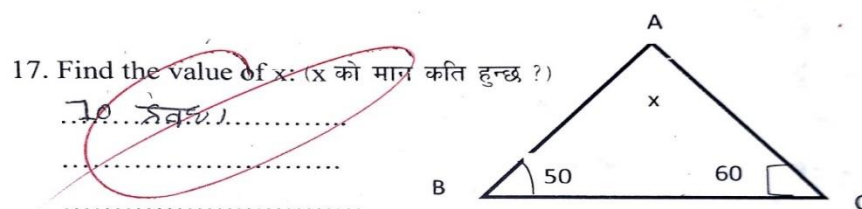


Figure 11

Basic Knowledge on Angles Sum of Triangle

Researcher asked her about a triangle and its basic properties. Researcher told her to draw a single example of triangle, she was able to draw a triangle but she did not know what the sum of interior angles of triangle is, even she did not know how to

write the name of angles of triangle. For solving this particular problem from the geometry, students need to have a knowledge regarding algebra for making the expression and equation and have a knowledge that the sum of interior angles of triangle is 180 degree, which researcher did not find looking of her answer, she does not have the knowledge, skill to convert the problem into algebraic expression. Lack of basic knowledge about triangle, she has done this type of mistake. So, researcher concluded that respondent B does not have fundamental concept about triangle.

Further details, question numbers 12, 27, 28 and 29 are also relating to geometry in achievement test. Surrounding to these questions, researcher had asked some questionnaires regarding the fundamental concepts of geometrical problems to the respondent 'B'. Researcher asked the questions on the different terms relating to the geometry such as interior angles, exterior angle, polygon, solids, right angled, equilateral triangle, isosceles triangle, area, and perimeter. But she was not able to answer to all the terms. Also, from her interview and answer given on achievement test, researcher came on the conclusion that she has the difficulties in basic knowledge of learning geometry. It is proved by the figures numbers 9 and 10 also.

Difficulties in understanding. Understanding is the one of the most essential component of learning geometry in mathematics. Students understand a logic, concept and sequence of geometry if he/ she can do all of the given. Explain geometrical concepts and facts in terms of simpler concepts and facts, easily make logical connections between different facts and concepts, recognize the connection when you encounter something new (inside or outside of geometry) that's close to the mathematics we understand. By taking interviewed to respondent 'B', she has the problems relating to difficulties on understanding the structure, difficulties in understanding the nature of geometry. She has no understanding about the different terms which are used in geometry such as interior angles, exterior angle, polygon, solids, right angled, equilateral triangle, isosceles triangle, area, perimeter. Similarly, the respondent has no understanding about above mention terms. From this, researcher concluded that this respondent doesn't have the understanding on solution of geometrical problems.

Further detail, from the solution that she has written on question number 16, she left this question blank. Even, she does not know that the area of given square can be found by counting the square box.

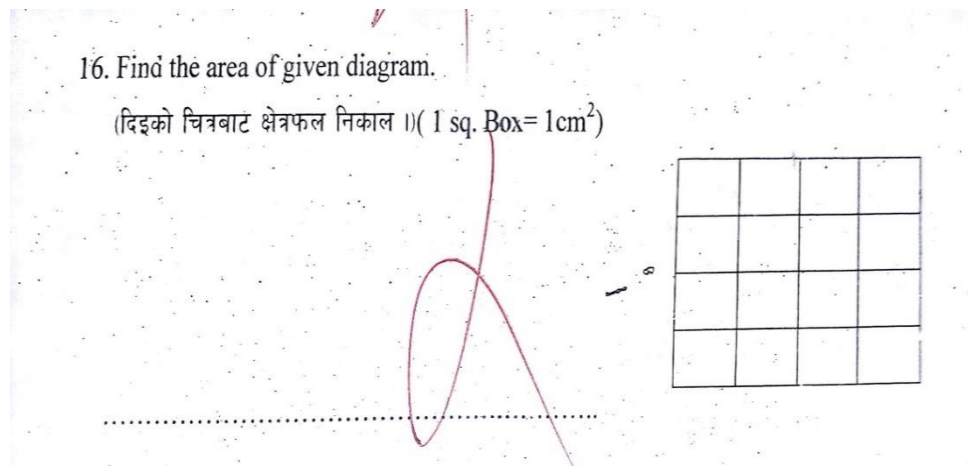


Figure 12

Understanding on Area

Researcher asked to her, why she left this solution blank, she answered that she does not know the idea how can solve this question. She told that she does not understand the calculation of area of given geometrical diagram in classroom. So, she has the difficulties on the understanding the geometrical problems, idea and concept. In addition, she has difficulties on understanding the structure, properties of polygons, pre-knowledge of previous classes.

Difficulties in transformation. This topic refers to the transformation of geometrical problems into the algebraic form. From this respondent 'B', she has also the same difficulties like respondent 'A' in difficulties in transformation of algebraic problem. In geometrical question, she was not able to change the geometrical verbal question into the algebraic form. She is unable to appreciate the appropriateness or reasonableness of solutions generated and is confused by language in word problems. She has difficulty with the vocabulary of math, trouble learning or recalling abstract terms, understanding directions, maintaining precision during mathematical work.

For more, the following question number 23 can show that she is not able to translate the verbal problem related to geometry. She left this blank which is shown in the figure 13.

23. Find the Area of rectangle with length 5cm and breadth 3cm.

(५ से.मी लम्बाई र ३ से.मी चौडाई भएको आयतको क्षेत्रफल पत्ता लगाऊ ।)



Figure 13

Transformation of Knowledge and Skill

From above, researcher concludes that she has the difficulties on translating the given verbal problem related to geometry, mensuration to the algebraic form.

Difficulties in applying skill. In geometry, applying skill takes as construction, calculation, shown, solved the different problems regarding geometry. If the students can use the formula, technique, ideas, logic in suitable context according to their previous learning then we can say that he/she has the applying skill. For the primary 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, use the formula of area and perimeter of square, rectangle from one context to another new context. In case of respondent 'B', she was not able to solve all the questions of geometry. After taking the interview with her, it is found that she does not have the applying skill in geometry. It can be cleared by solution of her achievement test in figure 14.

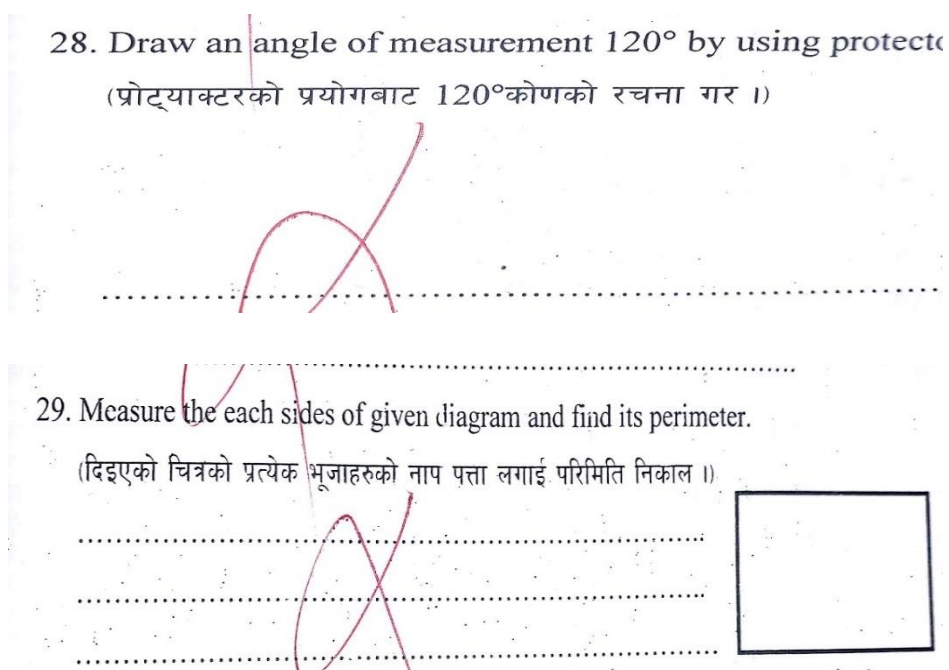


Figure 14

Applying Skill on Construction

From the figure 14, she left the page blank to construct an angle 120° and find the perimeter of above figure. From this, it is concluded that she does not have a skill to construct an angle and measure the length of line segments. She does not know that the perimeter refers to sum of all sides of given polygonal. Because of lack of above mentioned skill of applying, she left the solution blank. So, we conclude that she has a difficulty in applying skill regarding the geometrical formula.

Difficulties in process skill. Every steps of solution are the essential components on solving the mathematical problems. Difficulties in process skill are shown by students' error in doing mathematical operations, inability to do sequence of operations, or inability to explain the process of operations. In geometry, at first we have to visualize the given diagram or question on pictorial form then we have to translate the mental picture into the mathematical expression and then solve it according to BODMAS rule and logic. If we leave these steps on the solution then our solution might be wrong. Particularly, in case of respondent 'B', she left almost questions from geometry. She has written answers on question numbers 2 and 3, but she did not write their solution in complete steps. From this; we conclude that she has the difficulties in process skill regarding geometry.

Difficulties in encoding. Based on the solution on achievement test and interviewed taken to her, she does not know that how can we write the conclusion of results. She failed to interpret the answer in accordance with the context, wrote incorrect answers, or even did not write the answers at all. So, she has the difficulties in encoding on geometrical problems.

From this work, researcher found that most of the respondents have the same types of difficulties regarding learning mathematics which are already described above. Except the difficulties mention above, some respondents don't know that what does mean by set and even they are not able to list the set of seven days in a week they do not know the different measurement units, they are not able to convert the number into words, they do not know how can we find the place value of given number. Some representative solutions are given in figure 15.

6. How many lakhs are there in 1234567?
(संख्या १२३४५६ मा कति वटा लाखहरु हुन्छन् ?)

6

8. How many KG are there in 1 quintal?
(१ क्विन्टलमा कति के.जी हुन्छ ?)

X 2

13. Write in number "One crore, eighty two lakh and fifteen."
(संख्यामा लेख: "एक करोड, बयासी लाख पन्ध्र")

10245

21. How many minutes are there in 5 hours and 30 minutes?
(5H र 30M मा कति मिनेट हुन्छ ?)

23 20 2

Figure 15

Encoding on Arithmetic Problems

From the figure number 15, on question number 6, the respondent was not able to write the number of lakhs on 1234567. Similarly, on question number 8, 13 and 21 respondents were not able to solve these questions. Researcher interviewed to them to find the difficulties that why they did wrong the solution.

From the answer on achievement test and interviewed to them, researcher came in conclusion that they have the difficulties on basic concepts, process, understanding on structure. They have the difficulties on 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 are not relevant. They have trouble learning or recalling abstract terms, have difficulty understanding directions, have difficulty explaining and communicating about math, including asking and answering questions, have difficulty reading texts to direct their own learning, have difficulty remembering assigned values or definitions in specific problems, they may have difficulties interpreting and manipulating geometric configurations.

Causes of Difficulties in Learning Mathematics

The third objective of this research is to explore the ways to overcome problems faced by Chepang Students in learning mathematics. For finding the ways to overcome the difficulties, first we have to find the causes of difficulties of learning mathematics. After taking the interview to the mathematics teachers, principals of school and class observation, observation of school surrounding environment, study of mathematics curriculum and interview to the students, the causes of difficulties of learning mathematics in Chepang students are generalized and described. According to the Ginsburg (2016), the environmental conditions influenced for the learning of mathematics. Indeed, one might say that children are educationally at risk –at the mercy of a culture that devaluates mathematics, inhospitable schools, teacher who teaches badly, and textbooks that often make little sense. And of course, the risk is greater if the child is poor or from an underprivileged minority. Therefore, so many difficulties of learning which were create form different factors.

The difficulties in learning mathematics come from the internal and external factors of students. So, researcher tried to identify the causes in the following area

with the help of achievement test paper and interview with subject teachers, principals and students of different sample schools.

Students related causes. It is one of the important components of the causes behind the difficulties of Chepang students in learning mathematics and in a teaching learning process. Without students interest in the teaching learning activities there is no possibility to achieve the national goals of mathematics at primary level. Students' achievement depends on their need, interest, practices and seriousness in subject matter. Students related factors include mathematics anxiety, prior knowledge of students and students' labor in learning mathematics. Thus the collected data from interview, test and observation were analyzed and interpreted on the following sub-heading.

Prior knowledge of students Prior knowledge of students is one of the important aspect of student related factors which means the previous knowledge of the students towards mathematical contents. If students do not have pre-knowledge about mathematical topic, they will unable to understand the question what to do and cannot solve the problem. It shows that the lack of prior-knowledge is one of the significance causes of learning difficulties in mathematics. The basic knowledge of mathematics is the key factors which determined good performance of the students. It is also determine student's performance in the further study. Mathematical pre-knowledge is the infrastructure as well all round development of students in the mathematics sectors. Those students who have lack of sufficient prior knowledge did not want to learn and could not get success in the further level. It is responsible for students fail in mathematics in all level. In the line with discussion the following views of students were stated here related to prior knowledge of students. The above view of student emphasize that students have not sufficient previously learned mathematical knowledge. Students cannot assimilate of new mathematical concept and principle with previously learned mathematical structure.

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

Students feel mathematics is new one and difficult subject. Head teacher says that students were promoted unnecessary without knowing the concept of mathematical knowledge in the lower class. On the other hand the mathematics subject teacher say that the students have no sufficient basic knowledge in mathematics contents. These all response indicated that the students cannot able to assimilate or relating new mathematical concept and principal to previously learned mathematical structure. To be able to solve various types of problems from arithmetic, algebra and geometry, we need to make clear understanding of how basic mathematical concept works in order to solve problems. Lack of prior knowledge leads to committing various silly errors in the course of arriving at the conclusion. Thus, it is concluded that students' prior knowledge plays the most important role to good achievement in learning mathematics to Chepeng students.

Lack of student's labour It is another component of student related causes behind the difficulties of Chepeng students in learning mathematics. Generally mathematics achievements determine students labour in present situation; students are not laborious in mathematics learning. Students' labor is responsible for the good achievement and learning of mathematics. After analyzing the achievement test of Chepeng student, we conclude that they have the poor mathematical concept and they are careless towards their study. More than ninety percentages of Chepeng students are engaged in their home related works during school time. They have no enthusiasm to labor hard in learning mathematics and they never give the sufficient time to learn and practice mathematics. Students are engaged in unnecessary task instead of teaching activates. Some students are busy in their house hold work because they are busy in house hold work and farming. Most of the parents of Chepeng students are illiterate. Illiterate parents focus on their children on hose hold activities rather than to their study. As we know that the home environment always plays a vital role in learning mathematics.

Thus, lack of sufficient time for practice of students is the cause of difficulties on learning mathematics. According to the learning disability theory teacher and parents will be part of the intervention in terms of how students get individual aid for the different successful practice. But the students are not fully guided by the parents and teachers. It became difficulty in learning mathematics. So, on the basis of above justification researcher claimed that lack of labouriousness of student is one of the

most significance causes behind the difficulties on learning mathematics to the Chepang students.

Mathematics anxiety Mathematics anxiety is a one of the important aspect of International Journal of Elementary Education 2017 student related factors in learning mathematics. Math anxiety has been defined as "an inconceivable dread/fear of mathematics that can hamper with 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 mathematics learning process. When examining students' problems in mathematics anxiety as a feeling of tension, apprehension, or fear that interfere the mathematics performance. Mathematics anxiety refers to forget and confidence in subject matter. It affects the students' mathematics learning process. In the line with discussion, the following views of students were stated here related to mathematics anxiety.

In Rastriya Aadharbhut School, Deujar, I asked some participants among them respondent B said that mathematics is only for clever ones. It is difficult to learn; only talent students were able to learn mathematics. Respondent C was replied as my brother said me that mathematics had several formulas and these formulas always necessary to remember for learning mathematics and difficult to understand so I feel that mathematics is a difficult subject.

From the above information student and mathematics teacher discussion about the anxiety of mathematics indicated that mathematics has several formulas which are very hard to understand and not related to other subjects. Students were feeling mathematics as abstract subject. They generalized that mathematics has many formula and it is very hard to remember and use on new context. So that it is a most difficult subject. Many students are not able to answer the questions regarding mathematics. So they felt mathematics is most difficult subject among to all. In the sample schools, the dropout rate of Chepang students is maximum. They are not regularly attending the mathematics class. They feel the mathematics as most difficult subject.

Teacher related causes. Teacher related factors are the one of the most significance component of difficulties of learning mathematics at primary level. The

positive attitude of teacher creates positive impact to students learning process. Teacher can motivate to the students to the learning mathematics and use the students centered method in learning activities. Also, he/she can use the modern assessment system while evaluating the learning achievement of students. Motivation is the internal and external factors that stimulate desire and energy in students to be continually interested and committed to learn something. In the mathematics classroom, motivation refers an individual activity of students to learn mathematical knowledge. Positive motivation is stimulate the desirable behavior of students. Positive attitude towards mathematics play valuable role in learning mathematical knowledge in all stages of education (Acharya, 2017). But in this study it is found that teacher did not use to provide counseling to the students towards learning mathematics. That's why students have mathematics anxiety existed yet. So, motivation and counseling play a vital role in students pass in mathematics.

The progressive reports of Chepang students are mostly in single digit which demotivates to teachers and not to ready to teach mathematics. Because of mental state of teachers, they can't do conceptual teaching of mathematics.

Students share their views most of students say that they were not motivated by the teacher. They were not cheered about the significance of mathematics in their real life.

A student from Rastriya Aadharbhut School, Deujar name as respondent D said that there were never conducted any motivational program about learning mathematics. Also another student name as respondent E shared that teacher never used any instructional materials while teaching and learning mathematics in the classroom. A subject teacher of Rastriya Aadharbhut School, Deujar, and name as X said that most of the students in school are usually absent. So, the students cannot able to concentrate and give the full time to study and they cannot be motivated towards their study.

Also, Most of the Chepang students are afraid of talking to their subject teacher. They never share their feeling of learning to their subject teacher. She said that school was not provided any instructional materials relating to mathematics. So, it makes more difficult to teach visually to the Chepang students. School administration also does not motivate students for learning mathematics. So, Students have negative

feeling in mathematics and they feel it is difficult to learn. Another supported views of head teacher regarding motivation as given we are not able to provide counseling and motivation to study mathematics because we have no sufficient infrastructure and learning equipment. So student always feel mathematics is difficult.

In this regard Asubel's theory argues that students should be motivated to learn mathematics in meaningful way. So, we claim that the role of teacher will be mentors and role of students is active participation in teaching and process learning. Hence one cause of difficulties of learning mathematics to the Chepang students is lack of counseling and motivation to students.

Environment related causes. This is a significance component of student's learning difficulties in mathematics. In this research, environment related causes refer to the teaching and learning environment and home environment. Teaching and learning environment indicates that the environment inside of classroom and school. Home environment indicates that the family environment. The given causes determine the feeling and level of difficulties of students to the learning mathematics. Also learning achievement of students guides their families' environment and school environment. On the basis of data collected from the teachers, students, parents and observation of the environment, collected data were analyzed and interpreted on the following headings.

Teaching learning environment. This is the one of the most significance cause behind the difficulties of learning mathematics in Chepang students. It refers to the diverse physical locations, contexts, and cultures in which students learn. It typically refers to the context of educational philosophy or knowledge experienced by the student and may also encompass a variety of learning cultures, its presiding ethos and characteristics, how individuals interact, governing structures, and philosophy. Without proper teaching and learning environment, students cannot concentrate towards the learning activities which causes on the difficulties towards the learning mathematics.

In this study, the school environment is also the importance factor behind the difficulties of learning mathematics to the Chepang student. In teaching learning activities, teacher should have to accomplish the appropriate environment for learning mathematics. Teacher should address students need and interest. Also teacher have to

motivate to students in the learning mathematics. In the line of discussion, students, teacher were shared different views on environmental factor in the class and school. One of the student from Chaturmukhi School Shaktikhor said that her teacher teaches a mathematics but she is always afraid of asking the question with her subject teacher. Most of the Chepang students were afraid of ask the alternates questions relating to teaching and learning topic.

A student from Aadharbhut Bidhalaya Chhepedhap and name as respondent F said that teacher gives threaten to memorize mathematical problems and formula. So, I felt mathematics subject very difficult. A subject teacher from the Aadharbhut Bidhalaya Chhepedhap shared about his experience that school does not provide any type of teaching materials for the class V. Even school does not conduct any type of program to regulate the students regularly in school. Another mathematics teacher of class five from Shree Chaturmukhi Ma.Vi Shaktikhor said that the school had conducted a program for the regularity of Chepang student but only least percentage of students were regularly came in school for the certain period of time.

By observation, the sample schools do not have the sufficient learning materials. Chepang students belong to marginalized population of the country. Researcher found that no any programs were conducted by government level of country as well as school also did not run any type of program for the regularity of Chepang students in the sample schools. Also the subject teachers accepted that they were not able to teach in the classroom with student centered teaching methodologies and technical methods due to the lack of sufficient time and materials. Another supported views of head teacher towards teaching learning environment of school as given we cannot manage trained and professional teacher due to poor economic background of our school. School has limited sources and teachers. In case of Chepang students, they have their own language, but in school has been using Nepali language as a medium of instruction. So, students feel mathematics is a difficulties subject and they are weak in mathematics. Vygotsky argued that language is the main tool that promotes thinking, develops reasoning, and supports cultural activities like reading and writing. Vygotsky recognizes that learning always occurs and cannot be separated from a social context. Consequently, instructional strategies that promote the distribution of expert knowledge where students collaboratively work together to

conduct research, share their results, and perform or produce a final project, help to create a collaborative community of learners.

Thus, we concluded that different reasons such as: traditional teaching learning methodology, lack of teaching learning materials, lack of child friendly environment, not addressing the need and interest of students, irregularity of students, lack of appropriate physical infrastructure, insufficient time and resources of school can be taken as the causes of difficulties of Chepang students in learning mathematics.

Home environment. This is another one of the most significance cause behind the difficulties of learning mathematics in Chepang students. As we know that home is first school and mother is first tutor of child. Education of every child depends on their home environment. Good environment at home reduces the difficulties of students in learning mathematics. Several researchers have found out that the family environment and the socioeconomic status (SES) of the students is another major factor contributing to their success in mathematics. The study of McConney and Perry 1 has shown that both home environment and SES play a role in determination of student outcome. They found that good home environment is consistently associated with substantial increases in achievement in mathematics (McConney & Perry, 2010). The environment that parents provide at home can support children's learning and development. In particular, the home learning environment has been found to be a significant predictor of reading and math achievement. Internal parent factors have also been associated with the home math environment. For example, higher parent academic expectations have been linked to more frequent numeracy activities in the home and math performance. Parents' own anxiety about doing math has been linked with children's math performance, although the relation is not always direct. For example, high parent math anxiety was negatively associated with children's math performance when children also had higher math anxiety (Hart, 2016). If the home has the reading culture, then the achievement of children is higher. So, the home environment plays vital role for reducing the difficulties in learning mathematics.

By observation of home environment of particular students, the researcher concluded that most number of student's home have no reading environment. A student from Rastriya Aadharbut School, Deujar said that before coming school, every day she has to go in ranch (In Nepali called 'Baree') to cut the grass and after

completion the school she has to complete all house hold work with cooking food in morning and evening both time. Similarly, another student said that he has to do same type of work at home before and after the school time. By supporting this facts, a head teacher of Rastriya Aadharbhut School, Deujar said that because of their household work they have been absent since the admission day.

Respondent G from Shree Chaturmukhi Ma.Vi, Shaktikhor said that I have no any support from my home to learn because my parents were busy in farming and my families are illiterate I have to support in household work. Another supported views of mathematics teacher towards home environment of students as given students cannot give more time to learn mathematics because they are busy in household works. And parents have no concern about their child learning. So students are weak in mathematics. Similarly, the supported views of head teacher towards home environment of students are given as parents are illiterate and they cannot support to child education. The children are busy in household work instead of doing homework so that they don't have a time to practice mathematics at home.

Hence, Chepang students do not have sufficient time to practice mathematics at home. Almost of all families are poor economically, so they have to do labour for living daily life. At least they must have to do all house hold works before and after school which harms their reading time at home.

Parents related causes. Parents related causes are the one of the important components behind the difficulties of learning mathematics. Children's math attitudes formed as a result of environmental influences, especially those that occur in interactions with parents and teachers. For example, parents' and teachers' expectations for children's success in math are biased by their own gender stereotypes (Eccles et al. 1990). The education of child does not depend on only teacher's role but also depend on their parents awareness interest and knowledge about handing and guiding their children at home. Parents can introduce and teach values are depending on their parents' education.

A Marxist theory focuses on 'class struggle' hierarchy of society on the basis of economy. Being based on this Chepang belongs to 'haves not'. They are serving on wages and obliged to work out during school days too. Even they except donations

from different NGOs, INGOs and government. This economic aspect and their mental set for being dependent on others is directly hampering learning mathematics.

In case of multiple children, they alternate their siblings for household work and school. If 'A' goes to school 'B' stays at home for household work and vice versa.

After interview with students, subject teacher and head teacher of school, except the causes mention above, parental support, economic condition of parents can also be taken as the causes of difficulties of learning mathematics to the Chepang students.

Socio-cultural aspect. It is important for the community to raise its concerns regarding the quality of service and products in education. Community has a responsibility to ensure that education is reformed or transformed in order to meet emerging societal change (Khatri, 2019). Environment, society, community, surrounding school plays vital role to develop positive concern towards school and education. Accountability of community is essential to govern and manage institution in the community. If the community is not concerned and responsible towards the intuition, it cannot function. Well, in this research, the respondents clearly stated that the society of Chepang community are totally unaccountable towards their school. Not only that, other ethnic groups are too indifference towards it. A kid's education starts from home. Parents are their first teachers and they have a key role in shaping up their character (Khatri, 2019). From replies of respondents, Chepang community is totally irresponsible towards school and education. Parents are so careless about their children's education and future.

Second-language learning in a school context has a positive impact on the development of general cognitive skills of learners (ATA and CASLT, 2017). Nepal is multilingual country where no society is homogeneous. In such a situation our classes are full of diversities, especially here lingual. Language of the students, mother tongue and school language in which mathematics is taught in school varies greatly. Here, from the responses, Chepang community has its own mother tongue. So, they feel difficulty in understanding the basic concept of mathematics in Nepali language, which is instructional language in Nepal.

Sabline claims stratification of society through language based on indices of poverty, genetic grounds and environmental factors influence learning. Difference is equated with disadvantage when socially constructed norms and standards are imposed onto minority groups. Being based on this the above mentioned bases; disadvantaged groups have been the victim of socially constructed norms and value. The researcher has found that one factor causing learning difficulties in mathematics is early marriage which is resulting dropout of students in Chepang community.

“The dropout rate of Chepang students is high in lower secondary level.” Teacher A responded. He also added that the younger students from primary level are imitating the elders in dropping out schools.

In Chepang community, they frequently celebrate ceremonies and festivals. They stop going to school earlier than those festivals and don't rejoin school even after a week. So, they are not regularly present at school and it makes mathematics difficult.

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

Ways to Overcome the Problems

The third objective of this research is to explore the ways to overcome problems faced by Chepang Students in learning mathematics. On the previous section, this study revealed that the difficulties and causes of difficulties of Chepang students in learning mathematics. On this section, the major ways to reduce the difficulties of learning mathematics of Chepeng students has been discussed. The ways of overcoming the difficulties in learning mathematics are generalized on the basis of the data collected through the interview to the subject (mathematics) teachers, students, principal of schools and other stakeholders. First, we have to understand that if we reduce the causes mentioned above then it will be reducing gradually from Chepang students. The possible causes underlying difficulties and teachers' effort to help students overcome difficulties in learning mathematics. Triangulation of data from three different sources leads to formulation of the key ways to overcome the difficulties of Chepang students in learning mathematics.

It has found that the students have the difficulties in basic knowledge of algebra and geometry both. A mathematics teacher from the Rastriya Aadharbhut School, Deujar said that Chepang students have not 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 to this view, a mathematics teacher from Aadharbhut Bidhyalaya Chhepedhap said that we have to generate a mathematics practice environment at school as well as aware the students about the importance of mathematics in daily life. Students are afraid of learning mathematics, they are panic to ask alternate questions which causes a weak foundation on mathematics (Sources: interview, 2020). Hence, for reducing the difficulties on learning mathematics, mathematics teachers have the vital role. They should make mathematics as easier subjects. First, teacher have to eliminate the fear, mathematics' anxiety from the students and he/she has to clear the basic fundamental concepts of every concept and create students friendly environment at mathematics classroom and make an effort of attempting several problems on a daily basis. Students are discouraged from taking up the 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.

Chepang students have difficulties in understanding the problems from algebra and geometry. They have no strong foundation or basic concepts. The teachers bring and elaborate understanding to what does it mean to learn in-depth in mathematics. To elaborate on their concept of in-depth learning they compare traditional and modern ways of teaching techniques and argue about how transition from conventional mode of instruction to a more student-oriented mode of pedagogy could be adopted in mathematics classroom. A principal from Rastriya Aadharbhut School, Deujar said that Chepag students are less labourious, they are always busy on their household activities. For reducing their difficulties on understanding, they have to do more labour on basic concept. Also, he advised to subject teacher to use the instructional material at classroom. A subject teacher from same school opined that if students are regularly present at classroom, then they can easily understand the mathematical problem from anywhere. So, regularity of students at school is one of the major

important ways to overcome the difficulties on mathematics (Sources: interview, 2020). Hence, for increasing the understanding of Chepang 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 students centered methodology as well as sufficient instructional materials. For this, administration should manage the work environment for teacher as well as administration should enhance the teacher's skill regarding the modern teaching method and instructional materials in 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 more strong for better understanding on future.

Manipulation of operator symbol procedure is one of the lacks of Chepang students in learning mathematics. Almost students do not have the skill to use symbol in proper place while solving problems. Even they are not clear on BODMAS rule. "To eliminate this weakness, we have to manage extra time, which we can use for instructing on BODMAS rule, laws of operations (+, -, \times , \div)" said by principal who is the subject (mathematics) teacher from the Rastriya Aadharbhut School, Deujar. Hence to eradicate this type of difficulties, teachers have to provide a sufficient time to the students. Teacher should provide sufficient examples to the students. From the administration, sufficient extra time for learning mathematics to Chepang students have to be managed. Manipulation of sign is one of the most basic, necessary and important skills in a problem solver's repertoire, as without it a problem solver would hopelessly be stuck on innumerable problems. The skill of manipulation of sign is acquired through practice and solving problems.

Similarly, Chepang students have difficulties on transformation of given word problem in to algebraic expression as well as they have difficulties on translation of different geometrical problems into algebraic form. A mathematics teacher from Shree Chaturmukhi Ma.Vi Chandra Bahadur Gurung told that we could reduce this problems but we need to make regular attend of students in school and reduce the dropout rate of Chepang students. A head teacher from the same school supported this view and told that mathematics teacher should pay the good attention towards the reduction of difficulties on learning mathematics problems. He also said that we can

use the different test to identify the problem and according to their problem, we can follow the different measures for overcoming the difficulties on learning mathematics. Hence, to eradicate these difficulties, students need to do an in-depth reading. Teacher should make an environment for self-learning not for teaching. To reduce student difficulties in transforming words, phrases, or sentences into mathematical expressions, we suggest to give students more translation practices on this. In this way, they will become familiar with translating such phrases into appropriate mathematical expressions and to develop a better problem solving skills dealing with word problems. In this way, student difficulties can be observed more easily and teachers can give appropriate help to students during the learning processes in word problems.

Likewise, Chepang students have difficulties on applying and process skill of different formula. Lack of prior knowledge relating to contents, lack of students' labourness, careless of teacher on learning activities and irregularity of students in classroom. generate this type of problem in learning mathematics. A mathematics teacher from Rastriya Aadharbhut School, Deujar shared her experience that teaching method in mathematics is more teacher-centered rather than students centered. For the visual learning in mathematics, mathematics curriculum should focus on daily life related problems. So, curriculum should be more practical because students learn the knowledge in school and apply the knowledge in their house hold work. Then only they can understand and apply the mathematical rule easily. Hence, Mathematics is a subject which 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 skill to the students, there should be the suitable environment at school as well as at home to apply the formula which they learn at school. Teacher should also pay more attention and make mathematics funny and gaming subjects through the instructional materials which can be constructed at local level.

Analysis of the teachers' perspectives about the ways to overcome the difficulties of Chepang 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 stimulating learning environment in early stages to help evolution of mathematical knowledge.

Analyzing the perspectives of subject teachers, head teacher, students and other stakeholders, the difficulties of Chepang students on learning mathematics can be minimized. Subject teachers have to use the modern learning strategy and teaching materials. Use the information communication and technology to visualize the abstract nature contents as far as possible. Motivate the students more on doing rather than knowing. Teachers have to use an approach of learning rather than teaching. Creating a positive learning environment is essential for success in the classroom. Teachers should create a welcoming atmosphere where student 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 contents which are the building block for the further learning. There are more other factors related to parents. Parents also can play vital role for their children's learning. They have to create the suitable environment at home for self-learning and practicing of 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 give them a sense of support and confidence. Reading the lessons together is one of the best ways to be close with 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 with studies.

Similarly, administration has to pay good attention for increasing the achievement level of students and they have to be ready to take a responsibility and accountability of achievement of Chepang students on learning mathematics. For reducing the difficulties on 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 Chepang and focus on their learning. So that, the progress rate of Chepang students will increase and difficulties on learning mathematics will reduce. In this way, the difficulties of Chepang students in learning mathematics will be solving gradually and it will be eliminated.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS AND IMPLICATIONS

This heading contains the major finding and summary of this study. Finding of this research is based on collected data and 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.

Summary

The study emphasizes on the difficulties of Chepang students in learning mathematics. The purpose of this study is to find the learning achievement of Chepang students on primary level, explore the difficulties of Chepang students to learning mathematics and find the causes of difficulties and explore the ways to overcome problems faced during the process of learning mathematics by Chepang Students. This study is composed of six chapters, each of them dealing with different aspects.

This research was based on mixed research approach (Qualitative and Quantitative 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 with calculating the mean, standard deviation and t-test. Similarly, the data needed for qualitative analysis were collected through interview with subject teacher, head teacher and students. The samples were taken from different five schools of Chitwan district in Bagmati state of Nepal. The qualitative data were carefully generalized, analyzed and interpreted by using 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 National Assessment of Students Achievement (NASA) 2015. Based on analysis and interpretation of data, the finding of this research is presented in the hierarchical order in the heading on major finding.

Findings of the Study

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 Chepang students of grade V are 9.06 out of 30 but according to NASA (2015), it was 14.4.
- The range of obtained marks of Chepang students in achievement test is found 19 in which the maximum obtained mark is 21 and the least obtained mark is 2.
- The standard deviation of obtained marks of Chepang students is 4.27336. This shows that there is a large variation and scatter of marks of Chepang students.
- Chepang students have the difficulties on basic fundamental concepts of learning mathematics.
- Chepang students have the difficulties on 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.
- Chepang students have the difficulties in Manipulation of operator symbols Procedure.
- Chepang students have the difficulties on transformation of given algebraic word problem and geometrical figural problems into algebraic expression.
- Chepang students have the difficulties on process skill.
- Chepang students have the difficulties on the applying strategies, concepts, formulas and theories in the new context.
- Most of the Chepang students failed to interpret the results of their calculation used as the answer.
- 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 to the Chepang students.
- Students are not laborious in mathematics learning, they are always given a priority on their house hold task.
- Students suffer from the mathematical anxiety.
- Lack of motivation and counselling 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 interest of students, irregularity of students are taken as the causes of difficulties of learning mathematics.

- Likewise, lack of appropriate physical infrastructure, insufficient time and resources of school can be taken as the causes of difficulties of Chepang students in learning mathematics.
- Early marriage, language and geographical difficulties are the causes behind the difficulties of learning mathematics.
- Youngers who are studying in primary level imitate the elders who left the school. So, they feel mathematics as a difficult subject.
- Peoples surrounding to school are unaccountable towards the schools which causes lack of concern of the teacher in teaching learning activities in mathematics.
- Subject teacher should develop positive attitude towards mathematics to eliminate mathematical anxiety.
- Develop the skill of manipulation of sign through practice and solving problems.
- Make suitable environment for in-depth and self-learning for the students .
- Use the students centered methodology rather than traditional methodology on 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 study has the aim to find the learning difficulties of Chepang students. It was found that the Chepang students have the low achievement comparison to the National Assessment of Students Achievement (NASA) 2015. Behind the low achievement of students, there are several difficulties on learning mathematics such as difficulties on basic concept of contents, difficulties on understanding the problems. They have the lack of process skill; applying skills as well as they do not have the skill of transformation of any verbal problems, geometrical problem to the algebraic form. The major finding of this study shows that there are number of causes that are harmful to low achievement of Chepang students in learning mathematics. Chepang students do not have the pre-knowledge of the contents. Lack of prior knowledge, less labouriousness of students, more focus on house hold work rather than their study, mathematical anxiety were the major student related causes of difficulties of learning

mathematics to the Chepang students. Students' interest and positive feeling of mathematics decrease the difficulties of learning mathematics. The parents have also the meaningful role for the determination of difficulties of learning mathematics. This study found that the parents of Chepang students do not concern to their children's study. They are focused on the house hold work rather than their study. Due to poor economic condition, lacks of education parents are not aware that they have to teach their children.

To eradicate the difficulties of learning mathematics, first parents of Chepang students have to aware on the importance of education on children's future and school should conduct different program to decrease the dropout rate and absents rate of Chepang students. So, we should eradicate barriers influencing to learn mathematics and make mathematics learning enjoyable according to our context.

Implications

Observing the above study, the researcher has presented implications and recommendation which might be beneficial to the concerned authority further improvement in the mathematics teaching. The problems stimulated teaching learning activities, instructional materials and evaluation system. So, the following points reveal the implications of this study:

- This study can be used to eliminate the difficulties of Chepang students on learning mathematics to the teacher and other stakeholders.
- The concerned authority can use to know what the present context of Chepang students in mathematics at primary level.
- The teacher should motivate the weak students and praise them to participate in teaching learning activities
- Schools' administration should conduct a program to increase the achievement of Chepang students on basis of information provided by this reports.
- The school administration should interact to the students, teachers, guardians and other stakeholders to discuss the difficulties and come to the solution.
- Innovative and refreshment training, orientation and supervision should be provided to the teacher time to time.
- Train to the teacher to develop the skill of motivation and encouragement to the students towards the learning mathematics.

- Administration and subject teacher can conduct a special program to eliminate the mathematical anxiety from the students.
- Use of paradoxes in teaching and learning of mathematics can generate curiosity, increase motivation and create an effective instructional environment.
- Teachers should be encouraged to make and use teaching materials.
- For recommendation, Chepang communities are less in Nepal. So, this study should be carried out with a large sample and various schools of different parts of Nepal.
- This kind of study can be conducted at all levels of schools.
- We can conduct the study on the use of information, communication and technology (ICT) in Chepang communities' schools of Nepal.
- We can conduct research work on the drop rate of Chepang students.
- Also, the research can be done on the effect of the absent rate of Chepang students on their achievement.

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APPENDICES

Appendix-A

Specification Grid of Achievement Test

S. N	Areas	Cognitive Level			Total number of questions	Total Marks
		Knowledge & Understanding	Comprehensive	Application		
1.	Arithmetic	4	3	3	10	10
2.	Set	1			1	1
3.	Mensuration	3	1	4	8	8
4.	Algebra	1	2	2	5	5
5.	Geometry	3	1	2	6	6

Appendix-B

P-Value and D-Value of Achievement test

S.N	Roll No. of Students												R	P-value	D-Value	
	1	2	3	4	5	6	7	8	9	10	11	12				
Question no.																
1	1	1	1	1	1	1	1	1	0	0	1	1	10	83.333333	0.333333	
2	1	1	1	0	1	1	1	1	1	0	0	1	9	75	0.666667	
3	0	1	1	0	1	0	0	1	1	0	0	1	6	50	0.333333	
4	0	1	0	1	0	1	1	0	0	0	1	0	5	41.666667	0	
5	1	1	1	1	1	1	0	0	0	1	0	1	8	66.666667	0.333333	
6	1	0	0	1	0	1	0	1	0	0	1	1	6	50	0.333333	
7	1	1	1	1	1	1	1	1	0	1	0	1	10	83.333333	0.333333	
8	1	1	1	1	1	1	1	1	0	0	1	1	10	83.333333	0.333333	
9	1	1	1	0	0	0	0	0	0	0	0	0	3	25	1	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	1	1	1	1	1	1	0	0	1	0	0	1	8	66.666667	0.666667	
12	1	0	1	1	1	1	0	1	1	1	1	1	10	83.333333	0.333333	
13	1	0	1	0	0	1	0	0	0	0	1	0	4	33.333333	0.333333	
14	1	0	0	0	1	1	1	0	0	0	0	1	5	41.666667	0	
15	1	1	1	1	1	1	1	1	1	1	1	1	12	100	0	
16	0	1	1	1	0	1	1	1	0	0	0	1	7	58.333333	0.333333	
17	1	1	1	1	0	1	0	1	0	0	0	1	7	58.333333	0.666667	
18	1	0	1	1	1	1	1	1	0	0	0	1	8	66.666667	0.333333	
19	1	1	1	0	1	1	0	0	1	0	1	1	8	66.666667	0.333333	
20	0	1	1	1	0	0	0	0	0	0	0	0	3	25	0.666667	
21	1	1	1	1	1	1	0	0	0	0	0	0	6	50	1	
22	1	1	1	1	1	1	1	1	1	0	0	1	10	83.333333	0.666667	
23	1	1	1	1	1	1	0	1	0	0	1	1	9	75	0.333333	
24	0	1	1	0	1	1	1	1	0	0	0	1	7	58.333333	0.333333	
25	1	1	1	1	1	1	1	0	1	1	0	1	10	83.333333	0.333333	
26	1	1	1	1	1	1	0	0	1	0	0	1	8	66.666667	0.666667	
27	1	1	1	1	1	1	0	0	1	0	0	1	8	66.666667	0.666667	
28	0	0	1	0	0	1	0	0	0	0	1	0	3	25	0	
29	0	1	1	0	1	0	0	0	0	0	0	1	4	33.333333	0.333333	
30	0	1	1	0	1	0	0	0	0	0	1	1	5	41.666667	0	
31	0	1	1	1	1	0	0	0	0	0	0	1	5	41.666667	0.333333	
32	0	0	0	0	0	1	0	0	0	0	0	0	1	8.333333	0	
	21	24	27	20	22	25	12	14	10	5	11	24		0		
Where, R=No. of Correct answer																
Qno. 10 and 15 are eliminated.																

Appendix-C

Mean and standard deviation

Variable	N	Mean	Standard Deviation	Std. Deviation	Std. Error Mean
X	50	9.0600	9	4.27336	0.60434

Appendix-D

T-test

Test Value = 14.4						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
	-8.836	49	0.000	-5.34000	-6.5545	-4.1255

Appendix-E

Achievement Test Format for testing the level of knowledge in mathematics in Primary Level for students

Student's Name:..... Date:.....
 School's Name:..... Gender:.....
 Class:..... Roll No.:.....
 Adress:..... Age:.....

Attempt all the questions.

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

(त्रिभुजको भित्री कोणहरूको योगफल कति हुन्छ ?)

.....

2. What is the name of triangle whose all angles are less than 90° ?

(90° भन्दा कम नाप कोणहरू भएको त्रिभुजको नाम के हो ?)

.....

3. How many sides are equal in an isosceles triangle?

(समद्विबाहु त्रिभुजका कति वटा भूजाहरू बराबर हुन्छन् ?)

.....

4. What type of numbers are prime number?

(कस्तो प्रकारका अंकहरूलाई रुढ संख्या भनिन्छ ?)

.....

5. What is the place value of 3 to the number 53540?

(दिइएको संख्या ५३५४० मा ३ को स्थानमान कति हुन्छ ?)

.....

6. How many lakhs are there in 1234567?

(संख्या १२३४५६ मा कति वटा लाखहरू हुन्छन ?)

.....

7. What is the formula to calculate the perimeter of rectangle?

(आयतको परिमिति निकाल्ने सूत्र के हो ?)

.....

8. How many KG are there in 1 quintal?

(१ क्विन्टलमा कति के.जी हुन्छ ?)

.....
9. Write the formula to calculate the volume of cube.

(घनको आयतन निकाल्ने सूत्र लेख ।)

.....
10. What number is multiplied to convert the fraction into percentage?

(भिन्नलाई प्रतिशतमा लैजान कुन संख्याले गुणा गर्नुपर्छ ?)

.....
11. List the sets of 7 days of week.

(हप्ताका सात वारहरूको समूह बनाऊ ।)

.....
12. Define an equilateral triangle in your own word.

(समबाहु त्रिभुजको परिभाषा आफ्नै शब्दमा लेख ।)

.....
13. Write in number “ One crore, eighty two lakh and fifteen.”

(संख्यामा लेख: “एक करोड, बयासी लाख पन्ध्र”)

.....
14. If length and breadth of rectangle are ‘a cm’ and ‘b cm’ respectively, write the formula to calculate its perimeter.

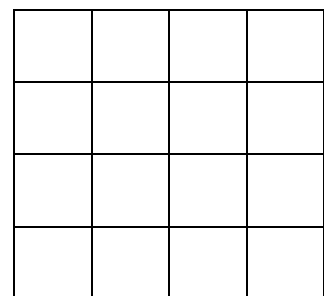
(यदि आयतका लम्बाई र चौडाई क्रमशः ‘a cm’ र ‘b cm’ भए यसको परिमिति निकाल्ने सूत्र लेख ।)

.....
15. Test, whether the equation is correct or not on $x = 4$: $3x + 2 = 14$

(समिकरण $3x + 2 = 14$, $x = 4$ का लागि सहि छ वा छैन जाँच ।)

.....
16. Find the area of given diagram.

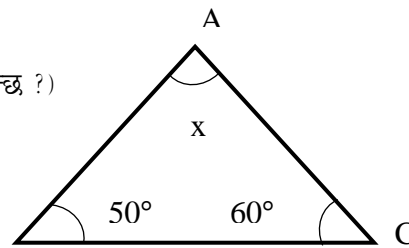
(दिइएको चित्रबाट क्षेत्रफल निकाल ।) (1 sq. Box = 1cm^2)



.....

17. Find the value of x: (x को मान कति हुन्छ ?)

.....



18. List the prime numbers from 1-20.

(१ देखि २० सम्मका रुढ संख्याहरु लेख ।)

.....

19. What is the prime factorization of 12?

(१२ का रुढ खण्डिकरण गर ।)

.....

20. Simplify (सरल गर): $25 - [8 + \{3 \times (5-2)\}]$

=.....
 =.....
 =.....
 =.....

21. How many minutes are there in 5hours and 30 minutes?

(5H र 30M मा कति मिनेट हुन्छ ?)

.....

22. What will be the area of square having length 8cm? (८ से. मि लम्बाई भएको वर्गको

क्षेत्रफल कति हुन्छ ?)

.....

23. Find the Area of rectangle with length 5cm and breadth 3cm.

(५ से.मी लम्बाई र ३ से.मी चौडाई भएको आयतको क्षेत्रफल पत्ता लगाऊ ।)

.....

24. What is the cost of 5 copies at the rate Rs. 20?

(प्रति गोटा रु.२० पर्ने ५ वटा कपिको मूल्य कति हुन्छ ?)

.....

25. Convert into percentage

(प्रतिशतमा परिवर्तन गर ।):

$$\frac{3}{5} = \dots = \dots$$

26. Find the value of x

(x को मान निकाल ।):

$$2x = 4.$$

.....

.....

27. How much it becomes when 3 is added to 5 times 2? (५ गुणा २ र ३ को योगफल कति

हुन्छ?)

.....

.....

28. Draw an angle of measurement 120° by using protector.

(प्रोट्याक्टरको प्रयोगबाट 120° कोणको रचना गर ।)

.....

29. Measure the each sides of given diagram and find its perimeter.

(दिइएको चित्रको प्रत्येक भुजाहरूको नाप पत्ता लगाई परिमिति निकाल ।)

.....

.....

.....



30. Write an expression and solve it: (अभिव्यजक बनाऊ र सरल गर ।)

If 5 is added to a certain number and the result is 18, what will be the number?

(यदि कुनै संख्यासँग ५ जोड्दा १८ हुन्छ भने, उक्त संख्या पत्ता लगाऊ ।)

.....

.....

.....

Appendix-F

Interview Guideline for Students

Student's Name:.....	Date:.....
School's Name:.....	Gender:.....
Class:.....	Roll No.:.....
Adress:.....	Age:.....

The researcher has asked the Chepang's 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 question 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-G

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 Chepang's 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 Chepang's students face in teaching learning process?
10. Do the parents visit the school to know about their children's study?
11. How do Chepang's students behave and interest to learn in classroom?
12. Do you have interacted to Chepang's students on their interest, difficulties, problems and needs?
13. What are the causes behind the difficulties of Chepang's 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 Chepang's student's achievement?
17. Have the administration conducted any program to the regularity of Chepang's students?

Appendix-H

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. Measures to reduce difficulties

Appendix-I

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 Chepang's students
6. Students concentration on learning activities
7. Communication of students to teacher
8. Use of reinforcement