

BASIC MATHEMATICS CONCEPT PRATICE IN THARU COMMUNITY

A

THESIS

By

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Letter of Certification

This is to certify that **Ms. Shanta Chaudhary**, a student of academic year 2073/2074 with Roll No. 7328455, T.U. Regd. No. 9-3-28-124-2016 and Thesis No. 1577 has completed his under my supervision during the period prescribed by the rule's regulation of Tribhuvan University, Nepal. Thesis entitled "**Basic Mathematics Concept Practice in Tharu Community**" embodied the result of his investigation conducting the period 2022 at the Department of Mathematics Education, Central Department of Education University Campus, and Kirtipur Kathmandu. I hereby, recommended and forward this thesis be submitted for the evaluation as the partial requirement to as award the Degree of Master of Education.

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Prof. Dr. Bed Raj Acharya

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Date: 27 June 2022

Letter of Approval

This thesis entitle “**Basic Mathematical Concept Practice in Tharu Community**” submitted by **Ms. Shanta Chaudhary** in partial fulfillment of the requirements for the Master’s Degree in Education has been approved.

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Recommendation for Acceptance

This is to certify **Ms. Shanta Chaudhary** has completed her thesis entitled “**Basic Mathematics Concept practice in Tharu Community**” under my supervision during the period prescribed by rules and regulation of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommended and forward her thesis to the Department of Mathematics Education to organize final Viva-voice.

Date: - 27 June 2022

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Defense Date: 3 July 2022

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Declaration

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

Date: - 27 June 2022

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Shanta Chaudhary

Dedication

This thesis is dedicated to my parents who spent their whole life to make me what I am today.

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Shanta Chaudhary

Abstract

The topic is on the “**Basic Mathematics Concept Practice in Tharu Community**”. The main objective of this study were to identify the basic mathematical practiced by Tharu Community, to identify the counting system and measuring system of Tharu Community, to find out geometrical knowledge practice by Tharu people in their traditional equipment. I used base on qualitative design. I used purposive Sampling. I selected own village Saptakoshi municipality at Sapatary District. This research was ethnography based and sample size were Farmer, senior person, teacher, housewife, student etc. I used tools Observation, Interview, Photographs. This study consists of five chapters. Chapter one included background of this study, Introduction of the Tharu Community, Statement of Problem, Objective of Study, Justification of the Study, Delimitation of the Study, Definition of key Terms. Second Chapter included Literature and Conceptual Framework. Third Chapter included methodology adopted for the study, Research Design of the Study, Sample of the Study, Research Tools, Data Collection Procedures, Data Analysis and Interpretation Procedure and Ethical Consider. Fourth Chapter included Analysis and Interpretation of Data and Fifth Chapter included Finding, Conclusion and Implication.

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CHAPTER I

INTRODUCTION

Background of the Study

Mathematics is the study of quantity, structure, space numbers and science and it developed with abstraction and logical reasoning from counting, calculating, and measurement and from the study of shapes and motions of physical objectives. The concept of mathematics had begun from the very beginning of the human civilization. The gradual development of mathematics took place (Lamichhani, 2016).

The word mathematics has been come from the ancient Greek word “Mathematics” which means teaching to learn where as in Nepali; it is called “Ganit” which means “The science of Calculation”. It is defined as the science of numbers, quantity, and space of which arithmetic, algebra, trigonometry, geometry etc. are the branches mathematics. Mathematics is not only essential in school. It is also used in official work as well as our daily life like selling things, arranging, counting etc. mathematical concept are applied.

According to James and James dictionary “mathematics state that “The logical study of shape, arrangement, quantity and many related concept”. According to Oxford advance learning theory’s Dictionary 7th edition mathematics is the science of the number and space. Branches of mathematics are including Arithmetic, Algebra, Geometry and Trigonometry, Mathematics is the study of the measurement, properties and relationship of the quantities and sets, using numbers and symbols. “Mathematics is group of science (including Arithmetic, Algebra, Calculus, Geometry) dealing with quantities, magnitudes, forms, and symbols” (Webster’s dictionary). According to the famous mathematician (Gauss, 1777-1855) mathematics in the queen of the science

and the theory of number is the queen of the mathematics. Mathematics has been defined in different way. According to James Joseph Sylvester to " Mathematics is not a book confined within a cover and bound between brazen clasps, whose contents it needs only patience to ransack; it is not a mine, whose treasures may take long to reduce into possession, but which fill only a limited number of veins and lodes; it is not a soil, whose fertility can be exhausted by the yield of successive harvests; it is not a continent or an ocean, whose area can be mapped out and its contour defined; it is limitless as that space be mapped out and its contour define: it is limitless as that space which it find too narrow for its aspiration; its possibilities are as infinite as the worlds which are forever crowing in and multiplying upon the astronomer's gaze". The great scientist Einstein mentioned mathematics is the free invention of human intellect. D'Ambrosio,(1990) define ethno-mathematics as: the mathematics which is practiced among identifiable cultural groups, such as national-tribal societies, labor groups, children of a certain age bracket, professional classes, and so on.

Nepal is small city but there are several ethnic group. Tharu community is also ethnic group. So they are own mathematical concept. They are own language, own religion, own Costume, mathematical concept (arithmetic concept, algebraic concept, geometric concept). All tharu peoples use mathematical concepts in their own daily work like make mudha, make dhakiya, make mana, make dali etc. Researcher had taken in this topic because tharu community has not explore and linked with mathematical concept (arithmetic algebra, geometry). Then researcher had chosen basic mathematics practice by tharu community.

Introduction of Tharu Community

Tharu are an ethnic group indigenous of Nepal. They have been living from east Jhapa to for west kailali. They are also found in Bahraich and Gonda in India. It

is one of the largest group of people in Nepal who are found setting all over the Tarai. The total peoples of Nepal is 2, 64, 94,504. The total Tharu people are 17, 37,470 (6.6 %) Censer p. (2068 B.S.). Tharu have their own language, make up food, religion, culture historical heritage religious place, custom, folk song and folk dance. Tharu are classified into five groups, they are Lampuchhiya, Kochila, Dangaura, Kathriya and Rana Tharu. They have been living from Jhapa to Kailali Kanchanpur. Each group is localized in particular area some groups are referred to by a term derived from the name of their area. They have been living in different area in inner Tarai. There are different types of folk dances are prevailing from eastern to far-western development region. They are Sakiya dance, Jhumra dance, Danhawa dance, Bhabra dance, Chorkheliya dance, Birhain dance, Tarwar dance, faguwa dance, Jatjatin dance, Lathi dance, Jhara dance etc. and different types of songs are also in Tharu culture.

Tharu follows Buddhist religion. They believe in Dhamis and Jhakris. They worship gods and goddesses, including Barah, Kuldebata, Sima Bhume, and Mandali by offering hens, goats as sacrifice. Their conventional occupation in agriculture. Researcher had decided to research about to the basic mathematical concept practice in Tharu Community. They have many mathematical concepts and process which are their own mathematic.

The Tharu is Mongolians. It has been proved that their language developed from Bharopeli Sansant Family. This ethic group has spread from eastern Mechi to western Mahakali although their language different to some extent according to the regional variety. Tharu is division in many Kingdoms before the unification by Prithivi Narayan Shah. Morang was one of them. The word Morang comes from Tharu word (Mor+anga) which is Tharu name. Here “Mor” refers to mayor (Peacock)

and “Anga” designates to the dressing of the woman is similar to mayor “peacock” from which this name comes that is maintained in the history Tharu D. (2018)

Statement of the Problem

Nepal is a multi-cultural, multi-ethnic multi-group, multi-religious and multi-lingual country. There are many ethnic group in Nepal. Then 2.6 billion population of Nepal groups and their 123 mother language and 125 ethic group National P.C. (2011). There are also different background socially, economically, culturally, religiously and their have own language, profession. Especially mathematical knowledge developed from European cultural. Researcher had researched Tharu Community own village. Researcher taken in this topic because tharu peoples have not explore and linked with mathematical concept (arithmetic algebra, geometry) own daily work and all researcher were investigated practice by western tharu community but didn't practice by eastern tharu community. So, researcher had focused on eastern tharu community and how can their basic be linked not explore and linked with teaching learning mathematics. So that is one issue of mathematics practice in Tharu community.

What kind of basic mathematical concepts practiced by Tharu Community? How can their basic concepts be linked with teaching learning mathematics? How many types of geometric concept are being used by Tharu Community in traditional equipment? Question likes occurs in my mind so, I am motivated to carried out this research entitle Basic mathematics concept practices in Tharu Community.

Objectives of Study

The main objectives of this study were as following:

- 1 To identify the basic mathematical practiced by Tharu Community.

- 2 To identify the counting system and measuring system of Tharu Community.
- 3 To find out geometrical knowledge practiced by Tharu people in their tradition equipment.

Justification of the Study

This study was reflects and represents the indigenous mathematical knowledge practice in Tharu Community. This study was helped for mathematics teacher, educators, researcher, students and mathematicians as so on. Also people who was interested to understand the artifact of Tharu cultural. Generally, every ethnic-group has its own script and counting system which help them for their prosperity for the further development. The ethno- mathematics is one of the important aspects of every ethnic group. This study had provided at identifying and exploring the mathematical concepts and processes of Tharu community. Ethno mathematics is the systematic study which gives clear direction to understand mathematical knowledge related to particular ethnic community was the greatest justification of the Study. The signification of this study were following justification.

- This study was explore the ethno-mathematical practices in Tharu Community.
- This study was helpful for teacher to link/connect day-to-day classroom practices with a mathematics of Tharu Community which increase student understanding.
- This study had helped counting system and measuring system in Tharu Community.
- This study had helped to remove geometrical anxiety.

- This study had helped to promote explore mathematical knowledge and skill of the Tharu Community.

Delimitation of the Study

Delamination of this study was as follows;

- This study was based on ethno-mathematical concepts in Tharu Community of Saptary District.
- The sample of the study was indigenous of 5 Tharu people from 1 Villages of Saptkoshi Nagarpalika, Saptary District.
- This study had based on only Tharu Community.
- It was concern only the mathematical knowledge concept, counting system, measuring system and geometrical knowledge practice by Tharu people in their traditional equipment.
- This study had based on qualitative deign.

Definition of key Terms

Some terms related to this study was define and explain with contextual understanding as follows.

Tharu. Tharu are an ethnic group indigenous of Nepal. They have been living from east Jhapa to for west kailali.

Mathematical Concept. In this research mathematical concepts refers to the concept of Tharu Community. Basic mathematical aspects like number, area, volume, weight, parameter, and also geometrical object so on.

Measurement system. Measurement system has been used to include the length, breath, high measuring method of Tharu Community.

Geometrical Knowledge. The geometrical concepts use every day like make pots, make Dhakie, make har(halo), make Modha. That is shape of triangle, square, rectangle, straight lines and right angle so on.

Ethnic group. In Nepal, there are many ethnic group of people with their culture, language, norms and values. So Tharu Community lies in ethnic group.

CHAPTER II

REVIEW OF RELATED LITERATURE

This Chapter present the literature related to these two types of review; empirical and theoretical. I got ideas and guidelines for this research. Some reviews literature related to my study are described below.

Empirical Literature.

According to Rai (2019), in this topic “Geometrical concept practiced in Rai community” The main propose of this study to identity the basic geometrical concepts and suggest the pedagogical implications of mathematical practice in Rai community. Researcher had used qualitative research design with purposive sampling. Researcher selected Lumma Kodak kaule-2 shadananda municipality of Bhojpuri district. Researcher found that several geometrical concept which were practiced by Rai community in their daily life activates such as concepts of square, triangle, circles, cylinder, rectangle, diagonal, semi-sphere, slope, parallel line, right, angle and straight lines so on.

According to (Tharu, 2017), in this thesis topic mathematical practice in Tharu community. The main objectives of this study to explore the acquired mathematics concept and practices in Tharu community and to explore the pedagogical implication of mathematics practice in Tharu community. Researcher had used qualitative research design with ethnography approach. Researcher selected Chandrapur Municipality of Rautahat District. Researcher used purposive Sampling. Researcher used Observation, Interview, data collection tools. He found various mathematical practices in Tharu community. Researcher focused on mathematical practices related to geometrical artifacts cultural artifacts.

According to D'Amboise (1984, 1985) father of the ethno mathematics. He used the expression "ethno-mathematics". It refers to the form of mathematics that was a consequence of having embedded. It was cultural activities his purpose in other than "doing mathematics" such as building house, exchanging money weighting product, valuation and precise geometrical pattern.

Bam (2010) did a research on the topic "Problem faced by the Vanguara Tharu in learning mathematics". The main objective of this study was problem faced by Tharu student at secondary level in Kailali district. Researcher found participant of Tharu student was very poor so they have many problem in learning mathematics like understanding problem, economic problem, language problem, environment problem etc.

Acharya (2016) studied on the topic "Basic mathematics concepts and processes used by Danuwar Community in Sindhuli District". The main purpose of the study to analyze the mathematical concept used by Danuwar Community in their daily activities. Researcher had used qualitative research with ethnography methodology to collect the data and to analyze the collection data research. Researcher found Danuwar Community has been using many mathematical concepts any formal mathematical equation, concepts of count, addition subtraction and some geometrical concepts such as circle, cylinder cone, parallel line, plane similarity, congruent etc.

Majhi (2018), in this thesis topic "Basic geometrical concepts practiced by Majhi Community". The main objective of this study was explore the pedagogical implications of basic geometrical concepts practiced by Majhi community. He had used qualitative research with purposive sampling. He selected Marin Village

institution-6 of Sindhuli district. He used the interview, observation and photographic as a data collection tools and find out real field data.

Pangeni (2006), studies on the topic “Concept of geometry used by Chitwan Tharu. The main objects of this study was to explore the geometric concepts used by Chitwan Tharu. He had used qualitative research design and tools of data collection were interview observation. He founded that; they make a shape and size of that in their mind and construct an object using traditional method of measuring using hand according to their thoughts design.

Upadhaya (2001), students on the topic “Effect of constructivism on mathematics achievement of greave 5 students in Nepal. His main objectives were to advocating and adopt construction in mathematics teaching in Nepal. He found the possibility of constructivism in Nepalese in Nepalese school is significant different in achievement then conventional of teaching.

Chepang (2011), in this thesis topic “A study of mathematics achievement of Tharu student in kailali district “. He found 35% Tharu student participant in school and they do a little interaction at classroom and few participation of another activities in mathematics. So lower achievement than other student.

Theoretical Review.

In this chapter, I have reviewed some theories related to my study. There are varies theories discuss about learning mathematics, ethno-mathematics, constructivism and cognitivist in brief.

Social Constructivism

Lev Vygotsky was Russian psychologist. He was born on November 5, 1896, in the town of Orsha, northeast of Manikin Byelorussia. He completed gymnasium in

Gomel with the gold medal in 1913. After graduating from Masco University with specialization in literature in 1917 and he began his literacy research. Vygotsky was famous scholar who emphasize on the social construction. Social constructivism is a theory among several theories on constructivism. Every knowledge in socially constructed and children learn when we got interact with outer environment either verbally or the observantly. Vygotsky theory is one of the them that regards social interaction between peers and adults an important aspect in creating meaning making sense and conveying within the context and knowledge in being unconstructed in social situation of negotiation rather than bring the reflection of the objectives reality which in termed as social constructivism. Social construction believes on the multiple constructions of the world. This theory each human being makes sense of the world in a unique way Vygotsky argue that the child's development cannot be understand by studying the individual that it need to examine the external world.

According to social constructivist Vygotsky knowledge in constructed in two ways in the social context. Firstly, social interaction influences the nature of knowledge that is constructed and process of individual use to construct that knowledge. Thus, the constructions are socially centered as in value, process of understanding constructing of knowledge on children to gain of knowledge is process of observing, reflection of thinking, performing, practicing and creation. To fulfill each and every mathematical need used applied mathematical concepts knowingly or unknowingly. The pattern used many mathematical concepts in their daily works but they didn't know the meaning about some of the applied concepts. The mathematics used several unique characteristics. The convention mathematics concepts were embedded in the work.

According to Vygotsky, infants are endowed with basic perceptual and memory capacities that they shared with other animal. These develop during the first year through direct connect with environment. The rapid growth of language leads to a profound change in thinking. It broadens preschool's participation in social dialogues with more knowledgeable individual, who encourage them to master culturally important task. Soon, young children start to communicate with themselves. As a result basic mental capacities are transformed uniquely into human's higher cognitive process.

The research is based on social constructivism a branch of constructivism. Tharu has lived with their culture environment. According to social constructivism people gained knowledge and environment. Tharu also gains knowledge from their interaction among social, culture and environment. They have to fulfill their needs and experience. Their knowledge and concepts are transformed on junior person. (Acharya, 2017)

Cognitive Constructivism

Cognitive constructivism is based on the work Swiss developmental psychologist Jean Piaget. Piaget's theory has two major parts: 'Ages and Stages'. Cognitive prospective theories focus on the both what people learn and process by which they do so.

Piaget's theory of development process that human cannot be given "Information which they immediately understand and use instead, human must construct" their own knowledge. They built their knowledge thought experience. Experiences enable them to create models in their heads. The cognitive constructivism holds that perception or cognition is largely influenced by culture, environment, social

activities, language and the form that taken in shared interpretive schemes and organization strategies. It says the human action. How we act in the world, guided by relevant intension and belief produced by our schemes of interpretation, the interpretive schemes suggest alternative lines of action. We then apply action schemes or strategies.

Conceptual Framework

Conceptual Framework is a systematic approach and very useful because we can understand that information. In conceptual framework researcher had tacked an ideas for this topic “Basic Mathematics Practice in Tharu Community”. After the study and analysis of number of theory’s and researchers carry out on project work from above review of theoretical model, researcher had come to the point out the topic basic mathematic concept in Tharu students to achievement the get knowledge (counting, measurement, and geometric).

The research was conducted on the following theoretical framework.

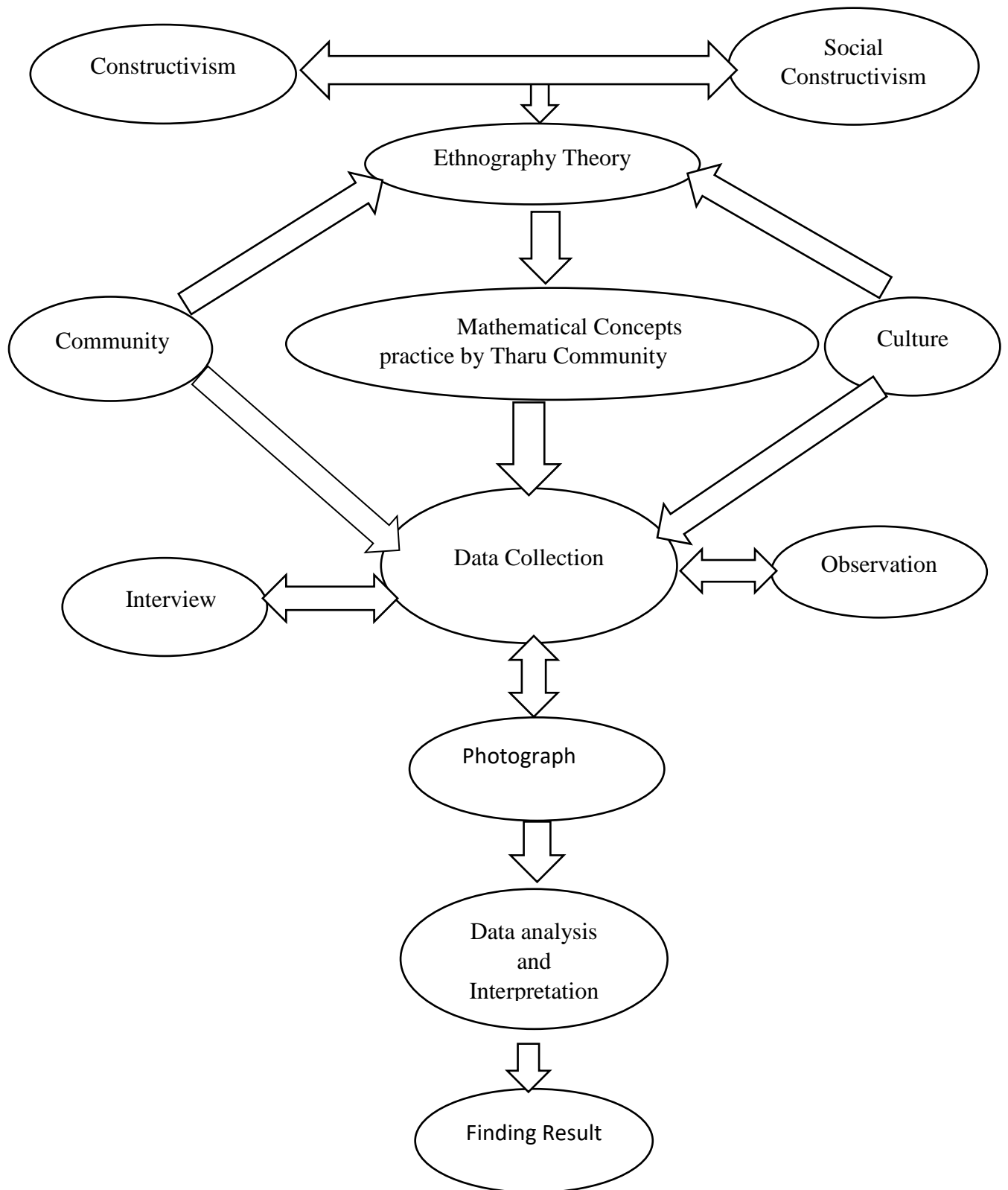


Figure-1

Source: Chandra Jang Majhi

Conceptual framework devised through the literature studies facilitated to attain research objectives, get the answer of the research questions and carry out the research work as a whole smoothly (Acharya, 2015). Constructivism is a philosophy of learning. It says all being has own understanding of the world. It says that people construct their own understanding and knowledge of the world through experiencing things and reflecting on these experiences when we encounter something new, Students make sense of the world by synthesizing new experiences into what they previously understanding. Social constructivist says that first child learn anything own social. And them skill develop has been own social environment.

On the base of above theories researcher had gone to the study area collect the data for completing the proposal “Basic mathematics concept practice in Tharu community”. Researcher was participant in all knowledge of Tharu people. Researcher was observe Tharu will indigenious knowledge, activities and mathematical tools. Researcher had taken interview to know Tharu mathematical concept. At last, Researcher had collected data and objective was be complete.

CHAPTER III

RESEARCH METHODS AND PROCEDURES

Research method does means to collect detail information and to use appropriate research method. In this chapter, I were include interpretive as my research. It helped the researcher to achieve the goal or objectives of the research. It describes Research design was of the study, Study site, Sample of study, tools, Observation, Interview, Photograph, Data Collection Procedure, Ethical Consideration.

Research Design of the Study

The research design of this study is ethnographic basis. This is ethnographic study on Tharu ethnic group. Ethnographic is a qualitative research method. It is also known as naturalistic. The researcher helped to explore the mathematical concept, measuring system, counting system and geometrical knowledge by Tharu ethnic group. The basic of ethnographic research is determine the physical and social environment of an individuals under study. The ethnography are in anthropology, which includes the study of cultural phenomena. In education research, ethnography had been used to study the culture of schools and the people who inhabit them. A qualitative research focused the understanding the social phenomenon and studies the case/things their natural setting. This type of study is especially important in behavioral science where the aim is to discover the underlining motives of human behavior. In this study researcher had used cognitive constructivism theory of Jean Piaget and social constructivism theory of Vygostskian.

Study Site

This research was qualitative. The population of this study is all the Saptary district. There are no any roles for selecting sampling in inquiry (Anderson 2001, p. 12). In order to obtain information about Concept of Mathematics among Tharu Community. The researcher had selected five people purposively from Saptkoshi Nagarpalika, Saptary District. The selection person from 1 villages can give appropriate and actual information.

Sample of the Study

This study had based on qualitative research. So the Sample size of this study will 5 Tharu people. At one village whose name Prasaha. I had selected with purposive samples and then respondents had chosen by the purposive sampling. I had selected 5 Tharu people from Prasaha and among one was senior Tharu teacher, 2 students, one farmer and one housewife. I had discussed with other senior Tharu people for my research study.

Research Tools

There are different tools for data collect like different journal, books, article, published and unpublished documents. This research had used Observation, Interview and Photograph for collect the data which are below.

Observation

Observation is the systematic process of recording the behavioral patterns of people, objects and occurrences without questioning or communicating with them. It is most use data collect. At first researcher had meet the people familiar with study area. Researcher had looked, ask, and interact with their activities(work, game, cutler, field work, making Dhakiee, house making, Bailgada making, cocking Ghungi,

construction of the tools, measuring system, counting system, and mathematical related activities). Researcher had got information of Tharu community. Researcher had observed their artifacts and the process how were they make. This information take by camera. Observation helps in finding the answer of different questions like how do they work? How do they make? What types of mathematical concepts they uses their occupation? So Researcher had used Observation tools.

Interview

Interview is an important method of data collect for face to face. Interview is an oral questionnaire. Interview had helped to get the information. The interview explained more explicitly. The interview's purpose had got mathematical concept of Tharu cultural information. The researcher had listen carefully the interview answer the observed their special expressions and tone of their voice.

First Researcher had gone own village. Researcher had met Tharu peoples. Researcher had made clear about their propose. Researcher had taken interview of Tharu community (Tharu child, Tharu farmer, Tharu housewife, Tharu senior, Teacher). The Maine objectives of interview had to identify the mathematical concept and measuring system also counting system by Tharu community. Researcher had taken photos, videos, audio record, and video record. And also Researcher had taken data collect about mathematical concept, counting system, measuring system and geometrical knowledge and of Tharu traditional.

Photographs

Photographs are most important tools for every research. The researcher had tock some photographs about the cultural costumes of Tharu community. Especially

making wood, Berra, Mud Pot's, Mauna, Gada's photo, married photo and their life-style.

Quality Standard

Lincoln and Guba (1985) propose four criteria for 'naturalistic' research. As their work to 'formalize rigor' has been particularly influential in the social science generally, and in the occupational therapy field specifically, it is worth focusing on their categories in depth. Interestingly, they link (or pair) their criteria with four used conventional quantitative inquiry: those of internal validity, external validity, reliability and objectivity.

Credibility. Credibility is achieved by addressing such aspects as immersion in the environment, accurate interpretation of the data, triangulation and member checking (Lincoln & Gude, 1985 as cited in Smyth, 2006). To maintain credibility of my research, Researcher had tried to spend more time with participants for the research. The data had been collect from multiple sources such as observation and interviews and had got several information related with researcher problem. After getting information, Researcher was again meet participants to make results realistic in the perspective about their cultural when researcher had got participants was eager to hear their culture actives and experience in the form of research.

Transferability. Transferability refers that findings of the researcher was applicable and similar to other educational setting. In the field of researcher, the data generating process can be useful and similar to other researcher in the similar area. To maintain transferability of the research, Researcher had captured the daily life activities, cultural, profession and social activities of the Tharu community by interview, observation and photos in this research. Also this study will encourage to

linking reader's culture and geometrical knowledge of socially available and will make education process effective and object oriented through ethno mathematics.

Dependability. To maintain dependability, Researcher had been observed and take interview with the participants and include in this study. If was repeat this study, the result of research would be some from the involvement in same place, same participants and same mythologies, when social environment is changing due to modernism.

Conformability. For Conformability, it is also important to ensure that the finding of the investigation are the result of the experiences and ideas of the participants and not the preference and characteristics of the researcher (Shenton, 2004 as cited in vandeleur, 2010, p.127). So to the quality of the results produced by an inquiry in terms of how well they are supported by the informants (member) who are involved in the study and by the events that are independent of the inquiry. So all collected information was based on participant's views, ideas, experience and interpretation. Thus, this helps to make the research findings are true and exam on participant's practice. In this study, Researcher was present idealks, View and the participant's had found same in their daily life activities.

Data Collection Procedures

First, Researcher had gone in my village with tools Observation, Interview and Photograph. So that Researcher had easy because that village was own village. Researcher had discussed with Tharu farmers, Tharu child, Tharu housewife and senior educated person. There were 5 respondents in my village. First, Researcher had taken interview any person whose senior educator person or farmer. After that Researcher had tock another person. Similarly Researcher was visited 1 village for the Sapatary District. First they had sat home and that time. Researcher had asked them

how to make these objects then they had told me the construction process, and Researcher was record their voice what they had told. At the time Researcher was taken photos and video. In course of visiting the villages at the first Researcher was introduce own self and Researcher hadn't told my purposes but Researcher had told to them I interested to find the basic mathematical concept in Tharu Community. Researcher had visited their work fields, schools, homes, farms and celebrating festivals for the information. At the time Researcher was taken photos with voice records and field note. Researcher collected information.

Data Analysis and Interpretation Procedure

At first, Researcher had visited own village area. Researcher was measure the tools of data collection need for on my researching study. Researcher had used unstructured interview and observation form. By using tools. Researcher make identification of basic mathematical concept our curriculum. Researcher had asked research question to teacher farmers, child, housewife, students, and senior educators. Researcher had taken interview according to objectives of the study and also record audio and video then Researcher was collect the information, after finishing collection of information, Researcher had divided different aspects. Then was start cording the similar information from field note. After finishing task, Researcher was categorize and keep the information under the different headings. Researcher was worked first objective then second objective at last objective in Tharu community.

Ethical Consideration

The researcher was many ethical consideration to conduct the research as give below.

- Respondent was equal respect.
- The researcher was politely speak for with respondents.

- The researcher was not keep the information in control and pressure as well.
- Carry out the researcher was not discriminate on the basic of respondent cast, culture, language and gender.
- The researcher had respected with responder.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

In this chapter analyze and interpretation of the data related to my topic “Mathematics concept practice in tharu community. The researcher divided this topic two parts. First part was included number/counting system and second part was included geometrical knowledge.

Number/counting System

Mathematics is very important parts our life because it is used everywhere. Then all peoples have used them daily life. I went my village (Saptari, Prasaha) for research. First day did not any question any person because that day visited them thing and objects like farmer, housewife, teacher and student. Second day I prepared my topic and asked farmer (Ramesh) about any idea of numbering/counting system of own tharu language.

He replied that some tharu peoples are educated but own self not educated then more than people used formally numbering/counting system own finger because that type idea know and also easy like yek for 1, due for 2, tinn for 3, chaer for 4, pacha for 5, chau for 6, satt for 7, aath for 8, nau for 9. The other counting are own language. Again I asked question with that person. What is this and how did you make this? That person replied its name is dhakiya. A bamboo is used to make dhakiya. This is easy to make. Initially the bamboo is measured and cut and then cleaned as much possible then the bamboo is placed in a circle shape. After that, it is made by measuring the flatness (chepthi) of the bamboo. I completed to mathematics directly or indirectly.

Basic Mathematics Operation

Researcher had analyzed the tharu mathematical operation. The researcher was differed how tharu people used the addition, subtraction, multiple and divided own daily life and activities.

Addition

Addition is operation of mathematics. It is very important part of mathematics. Its symbol by add symbol (+) for example: - $4+5$, $10+4$, $(a+b)$, $(x+y)^2$, Ram+Sita. This operation has used our daily life and everywhere. This Operation (Addition) is popular and always used our daily life. This Operation is popular for tharu community because necessary tharu peoples are farmer. So there are easily used for example sum of money, sum weight of rice or anything, sum of animals etc.

In this case of addition

Researcher had gone to field. Researcher had asked question tharu farmer people how do you sum $(10+20)$? First pal Tharu farmer people was counted 10,20,30,....., So tharu peoples expressed 10 is small number then I put also 10 number now tharu people asked I am used mathematical operation but own idea because own idea is easy for me. Researcher used mathematical problem solved own fingers or small, small stone, stick etc. Again, Researcher asked question related to the addition as below.

Researcher asked question tharu student "If you have rs.35 and teacher give you rs.25 how much money do you have?"

In this question "Tharu student the first expressed both number in the group of 10 base and remainder, the number of first number is 35(paitish) and second number

is 25(pachish). Then the puts together groups of 10(dash), 10(dash) and 10(dash) in one side and sets of remainder in another side. Group of 10(dash), 10(dash), 10(dash) and also 10(dash), 10(dash) make 50(pachash) and 5(pach) one and 5(pach) one make 10(dash). So in total number 60(sathi).

So mathematical expression is here,

$$35 = 10(\text{dash}) + 10(\text{dash}) + 10(\text{dash}) + 5(\text{pach})$$

$$25 = 10(\text{dash}) + 10(\text{dash}) + \dots + 5(\text{pach})$$

$$60 = 50(\text{pachash}) + 10(\text{dash})$$

Also case,

Researcher asked question tharu housewife (women) “If you have 12 pots and some on give 15 pot how much do you have?”

In this question, housewife the first expressed 12 pots equal to 10(dash) and 2(due). And next 15(pandra) is equal to 10(dash) and 5(pach). Then the 10(dash) and 10(dash) added in on side and remainder 2(due) and 5(pach) added another side. Group of 10(dash) and 10(dash) make 20(bish) and 2(due) and 5(pach) make 7(sat). So in total 27(sataesh).

Thus, mathematical expression is here

$$12 = 10(\text{dash}) + 2(\text{due})$$

$$15 = 10(\text{dash}) + 5(\text{pach})$$

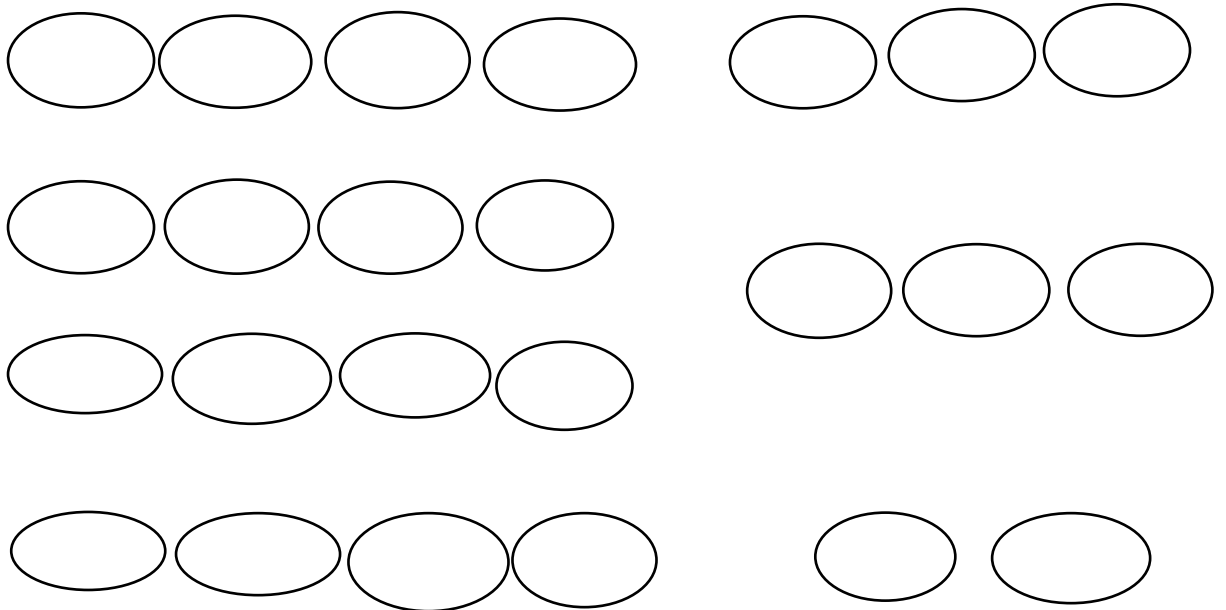
$$27 = 20(\text{bish}) + 7(\text{sat})$$

Thus, above the data Researcher concluded their addition problem solved base on 10 and above 100,200, 300.....1000.

Subtraction

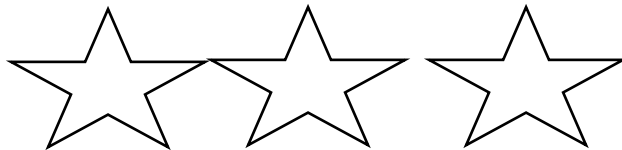
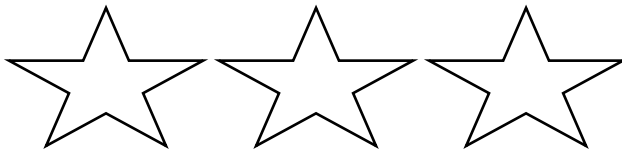
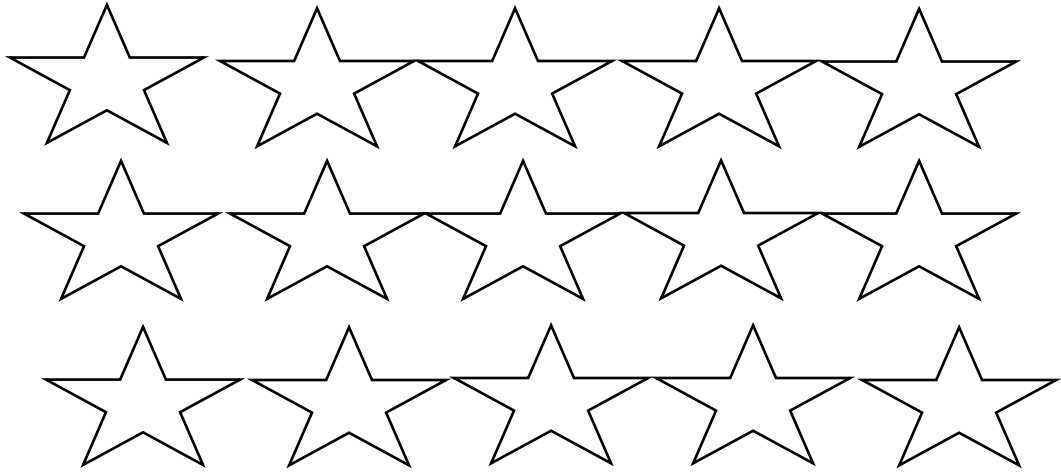
Subtraction is also importance part of mathematics operation. It's means to remove. But it is more difficult concept than addition. Tharu people normally solved by finger, stone, any mathematical problem. Researcher had gone in field researcher found a student. Researcher asked question related to subtraction and responded as below.

If you have 16(sora) eggs, if you losted 8(Aath) eggs, how many eggs remaining?



There is remaining 8(atha) (by using stone)

For the next concept, Researcher asked question another student, there are 15(pandra) stars and 6(xau) stars are through, then how many stars are their?



There is remaining 9(nau) (by using finger of hands)

Multiplication

Multiple is also important part of mathematics operation. Multiple mean repeated form of addition. Normally many people use mathematical operation mainly multiplication. Researcher asked questions senior person related to multiplication.

If 1(yek) copy of prize rs.10 then how many prize of 10 (dash) copies? Then senior person solved this problem. So answered is 100(saiya).

Researcher asked how?

Senior person said following that:

1(yek) prize=rs.10=rs.10 (dash)

2(due) prize=rs.10+rs.10=rs.20 (bish)

3(tin) prize=rs.10+rs.10+rs.10=rs.30 (tish)

4(chaer) prize=rs.10+rs.10+rs.10+rs.10=rs.40 (chalish)

5(pach) prize=rs.10+rs.10+rs.10+rs.10+rs.10=rs.50 (pachash)

6(xau) prize=rs.10+rs.10+rs.10+rs.10+rs.10+rs.10=rs.60 (sathhi)

7(sat) prize=rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10=rs.70 (satry)

8(Aatha) prize=rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10=rs.80 (Ashi)

9(nau) prize=rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10=rs.90

(nabe)

10(dash)

prize=rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10+rs.10=rs.100

(saiya)

So total prize of 10 copies is 100.

From this discussion researcher was found that senior person easily solved that problem without the concept of multiplication.

Again, Researcher asked question senior person “If 1 glass of prize is rs.50 then how many prize of 5 glasses? Then senior parson solved that problem and answered said 250 (due saiya pachash).

Senior person solved that problem following way:

$$1 \text{ glass} = 1 * 50 = \text{rs.}50 \text{ (pachash)}$$

$$2 \text{ glasses} = 2 * 50 = \text{rs.}100 \text{ (saiya)}$$

$$3 \text{ glasses} = 3 * 50 = \text{rs.}150 \text{ (yes saiya pachash)}$$

$$4 \text{ glasses} = 4 * 50 = \text{rs.}200 \text{ (due saiya)}$$

$$5 \text{ glasses} = 5 * 50 = \text{rs.}250 \text{ (due saiya pachash)}$$

So total prize of glasses of 5 glasses is rs.250 (due saiya pachash)

The tharu people still use multiple problem solved by addition method.

Division

Division is also important part of mathematics operation. It is difficult another operation. It is repetition of subtraction. Tharu people have no divided concept but they solved mathematical problem by another idea by subtraction. But they have no idea divided mean whatever. But they have solved any mathematical problem. Divide is very important for math. Normally housewife, farmers’ didn’t understood what is divided. But senior person and tharu students know.

Measurement of Volume Use by Tharu People

Measurement is important part for measure to any objects. Researcher researched own village Saptakoshi municipality, Saptari. Tharu community have their own traditional pot for measure like Mauna, glass (lotni), tama (make by wood, make by pital, make by straw so on). Tharu people start measuring in small units because they know small units like pau (pauwa), Dhak (sera), Dharni. At Tharu community have also another traditional objects like putting Paddy (make by bamboo, make by soil). They are also putting grass (ghass) make by bamboo. Tharu students are undersding this tharu's traditional units. But another units are difficult for tharu students.

Tharu community's traditional measuring system.

Conversion of Volume

1 pasairi (dhak) = 5 kilo (kg)

2 pasairi (dhak) = 10 kilo (kg)

3 pasairi (dhak) = 15 kilo (kg)

4 pasairi (dhak) = 20 kilo (kg)

5 pasairi (dhak) = 25 kilo (kg)

Geometrical Knowledge Use by Tharu People

The Following geometrical concepts practiced by community were observed and analyzed in this research.

Concept of Circle

This helps to teach now can we construct the circle, parabola, center.

Mauna

Dhama is traditional objects used in tharu community for different purpose. Dhama is used for to keep paddy (dhan), to keep vuja (murhi), to keep dal (dael). It is maide by straw (lar) and treads (dhaga). It is looking beautiful. It is very strong tool for geometrical concept. It is different different size. There are used the process of circle, parabola, center. It is used for geometrical concept. Researcher went field. One women maked Mauna. Researcher asked her. It is like to circle but women didn't understand. And again she maked mauna. Researcher found this mauna like circle. It is related to geometrical concept. The concept of circle (mauna) with diameter. Figur given below.

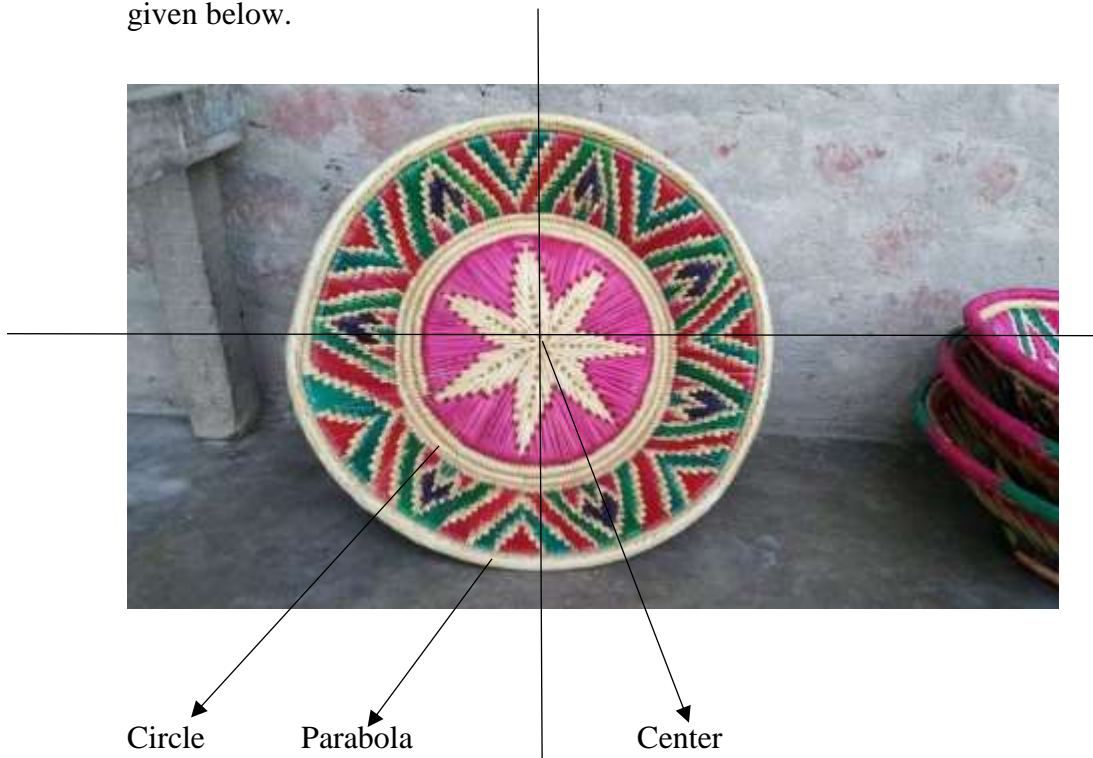


Figure 1 (Mauna)

Mauna is circle shape by tharu community. Researcher did not look another community. It is so imaging and looking so beautiful. There were different size of mauna like circle. This objects used to teach the concept of circle in the school. So this types objects gave geometric concept. So that students easily take circle concept.

Jat

Jat is also traditional object for geometrical concept. It is used for grind the lentils (Dal), grind the rice, grind the turmeric (hardi), grind the wheat (gahaum).

There are used circle, center, length and parabola. It is also geometrical concept. And figure is below.

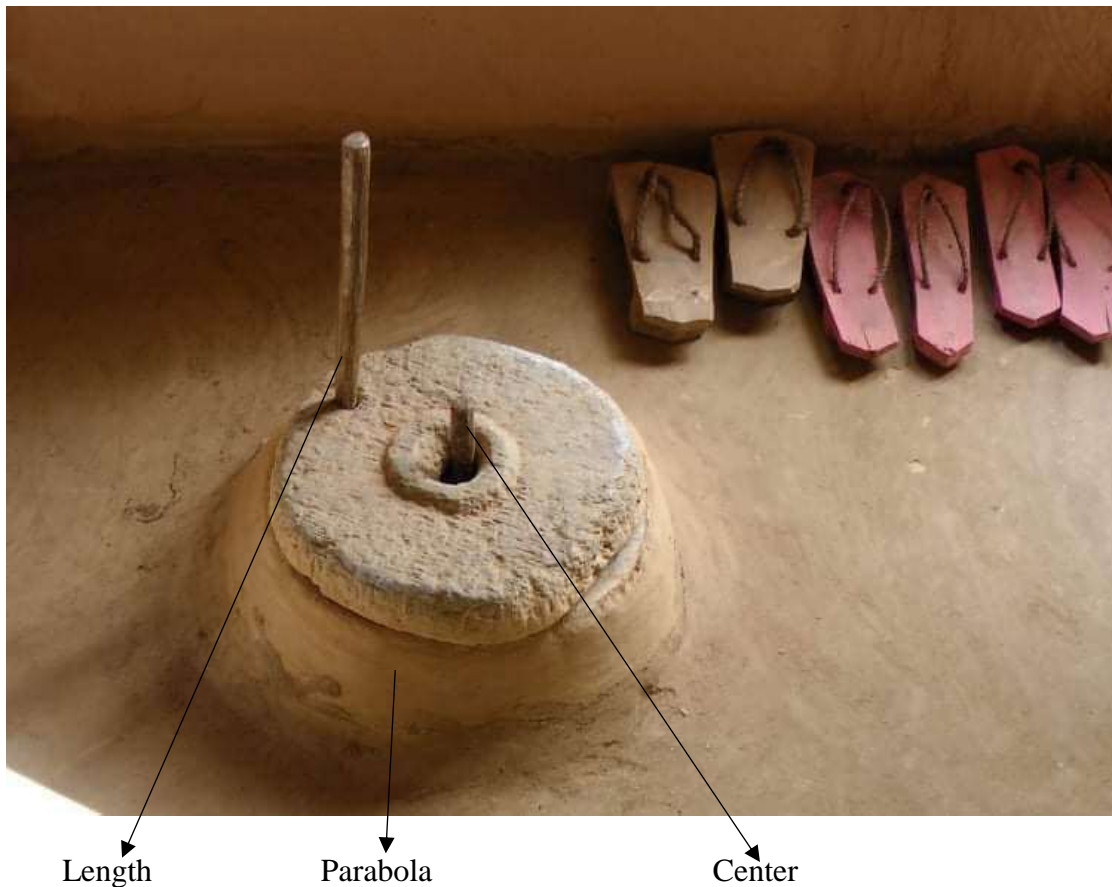


Figure 2: Jat (Jato)

Jat is circular shaped. It is cultural object of tharu community. We take circle concept by that object. Jat is also used another community. It is grind foods like rice (chaur), wheat (gahaum), almonds (badam). Jat is also used concept of circle.

Students learn to circle by fun because students watch this object and students easily take circle concept.

Nanglo (Supa)

Researcher had gone field. Researcher met women. They made own tharu cultural bread. That all bread are equal shape like to circle. That bread was traditional popular of tharu community. Researcher asked question her “how do you make?” She replied at the beginning, we should change their shape of using materials such as rice or wheat by electrical machine. Afterwards water is boiled and retail the boiling water according to quantity of the materials also to use our hands to move it and place until ten minutes covering that moving situation. After preparing everything for the bread we make it with own hands blending oil into the material. Approximated, we make this type of traditional bread in our tharu community. By the fire of wood. And there was a nanglo (Supa). Nanglo is important object in tharu community. Nanglo is perfect example of circle. That materials help us to teach the geometric concept of circle, parallel, perpendicular etc.



Perpendicular

Parallel

Circle

Figure:-3 Nanglo (Supa)

Concept of Triangle

This helps to teach now can we construct the triangle.

House

This is a house. We can see different geometrical parts like wall, door, windows, trees etc. We can take triangle concept in this house.



Figure 4: House

Concept of rectangle

This helps to teach construct the rectangle

Rectangle

Rectangle is a quadrilateral with four right angles. Rectangles angles are equal and rectangle with four sides of equal opposite side. Its perimeter is $2(\text{length} + \text{width})$.

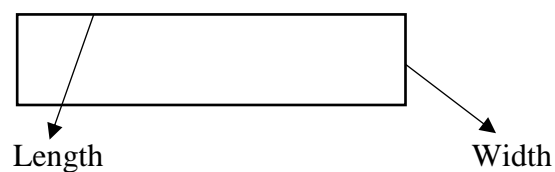


Figure 5: Rectangle

CHAPTER V

FINDING, CONCLUSION, AND IMPLICATIONS

Finding of the Study

On the basis of analysis and interpretation of data. The major finding of this studies were follows:

- This study helped counting system by tharu language. Tharu people were counting the number 1 like yek, 2 like due, 3 like tin, 4 like char, 5 like pach, 6 like xau, 7 like sat, 8 like Aath, 9 like nau,....., 10 like das, 100 like sau, 1000 like yek hajar, 100000, yek lakh so on.
- This study helped measuring system by tharu concept.
- There are four mathematics operation like addition, subtraction, multiplication, divided.
- Tharu people counted money by making groups of rs.5, rs.10, rs.20, rs.30, rs.40, rs.50, rs.100, rs.1000 so on.
- Tharu people counted by own language.
- Tharu people have geometric concept by own cultural pots.
- They are still use stone, stick, fingers, on four basic mathematics operation.
- Tharu students easily solved mathematics problem by own language.
- Tharu people have their own name of number.
- Addition and Subtraction are just opposite.
- Divided was limited on distraction by subtraction methods one by one.
- Measurement system are traditional in tharu methods.
- Tharu people have mostly construct geometric concept by mauna, dhama, gada (gari), halo (har), house (ghar) etc.

- Researcher found more than people was uneducated.
- Tharu people understood mathematical concept by tharu language.
- Farmer had already geometric concept. Because they make geometric things. They did not have known. It is geometric concept.
- The tharu of Saptkoshi nagarpalika has their own system of mathematical concept and their geometric knowledge.

Conclusion of the Study

Nepal is a multi-cultural, multi-ethnic group which have own traditional mathematical concept. Tharu community is group of indigenous. They have own mathematical concept. They are own counting system, own measuring system, own geometric concept and basic fundamental operations. They were count any making the group. They solved addition, subtraction, multiplication and divided own ideas but easily solve that problem. Mainly the old tharu people solved addition and subtraction problem by figure and grouping methods. They generally made the group 10, 20, 30...100 etc. and solve problem. Students learn geometric concept own geometric objects like mauna, beera, mudha, hasiya, jat etc. Generally the old people not understood what is multiple and divided but they were solved problem own ideas. Tharu students were easily learn mathematical concept by tharu's cultural things. Because they looked that things. And students used day to day own activities. Researcher found girls students are more than more weak than boys' students.

Implications of the Study

This study was conducted with short time period. On the basis of the finding of this research the following suggestions have made for further researcher.

- This study was limited to shaptkoshi multiplicity of saptari district. They have own language own counting system, numbering system and geometric concept. They were used maithali language.
- This study helps known tharu mathematical concept of tharu language.
- This study helps how to make tharu object and how to applied mathematicsc concept of tharu language in classroom.
- This study helps to find teaching material available in the tharu community and simple to teach the student and class is effective.

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Appendix I

In-depth interview schedule for a Tharu Student

Personal Detail:

Date of interview:-..... Sex:-.....Age:-.....

Name:-.....Class:-.....Address:-.....

School Name:-.....Roll Number:-.....

1). What is your name?

2). How old are you?

3). Which class do you read?

4). How many members are there in your class room?

5) How do you solve addition and subtraction?

Appendix II

Interview Guidelines

In- depth interview schedule for Farmers, housewife, senior person, Teacher

1. What is your name?
2. How old are you?
3. How many numbers can you count in your own tharu language?
4. How many members are there in your family?
5. How do you make Dhakiya, Mauna, Khatiya, Nanglo (supa), bailgadi?
6. How do you measure rise, milk, oil, mango, wheat?
7. How many domestics' animals do you have?
8. What is your occupation?
9. How do you teach addition in your classroom by own tharu language?
10. How do you teach subtraction in your classroom by own tharu language?
11. How do you imply the counting concept in your community?
12. How do you imply the geometric concept in your classroom?

Appendix III

English	Tharu	Devnagarik
One	Yek	Eka
Two	Dui	Dui
Three	Tin	Tin
Four	Chaer	Char
Five	Pach	Pach
Six	Chau	Chha
Seven	Sat	Sat
Eight	Aath	Ath
Nine	Nau	Nau
Ten	Dash	Dash
Eleven	Yegyar	Yeghar
Twelve	Bar	Bahra
Thirteen	Ter	Tehra
Fourteen	Chaud	Chaudha
Fifteen	Pandra	Pandra
Sixteen	Sor	Sohra
Seventeen	Satra	Satra
Eighteen	Aathar	Athar
Nineteen	Unaesh	Unaesh
Twenty	Bish	Bish
Twenty-one	Yekaesh	Yekkaish
Twenty-two	Baesh	Baesh

Twenty-three	Taiesh	Teish
Twenty-four	Chaubish	Chaubish
Twenty-five	Pachish	Pachish
Twenty-six	Chhabish	Chhabish
Twenty-seven	Sataesh	Sataesh
Twenty-eight	Athaesh	Athaesh
Twenty-nine	Untish	Unantish
Thirty	Tish	Tish
Thirty-one	Yektish	Yektish
Thirty-two	Batish	Batish
Thirty-three	Tetish	Tetish
Thirty-four	Chautish	Chautish
Thirty-five	Paitish	Paitish
Thirty-six	Chhatish	Chhatish
Thirty-seven	Saitish	Sattish
Thirty-eight	Artish	Artish
Thirty-nine	Unchalish	Unanchalish
Forty	Chalish	Chalish
Forty-one	Yekchalish	Yekchalish
Forty-two	Baiyalish	Bayalish
Forty-three	Tirchaelish	Trichalish
Forty-four	Chauwalish	Chauwalish
Forty-five	Paitalish	Paitalish
Forty-six	Xaiyalish	Chhayalish

Forty-seven	Sarchalish	Saitalish
Forty-eight	Archalish	Athchalish
Forty-nine	Unanpachash	Unanchash
Fifty	Pachat	Pachash
Fifty-one	Yekaban	Yekaun
Fifty-two	Baban	Baunn
Fifty-three	Tirpan	Tirpann
Fifty-four	Chauban	Chauban
Fifty-five	Pachan	Pachpann
Fifty-six	Chhapan	Chhapann
Fifty-seven	Santaban	Santaunn
Fifty-eight	Athaban	Anthauun
Fifty-nine	Unansaeth	Unansathi
Sixty	Saeth	Sathi
Sixty-one	Yeksath	Yeksathi
Sixty-two	Basath	Baisathi
Sixty-three	Tirsath	Tirsathi
Sixty-four	Chausath	Chausathi
Sixty-five	Paisath	Paisathi
Sixty- six	Chhiyasath	Saisathi
Sixty-seven	Sarsath	Sarsathi
Sixty-eight	Arsath	Arsathi
Sixty-nine	Unansatar	Unansatari
Seventy	Satar	Sattari

Seventy-one	Yekhatar	Yekhatar
Seventy-two	Bahatar	Bhatar
Seventy-three	Tihatar	Tihatar
Seventy-four	Chauhatar	Chauhatar
Seventy-five	Pachahatar	Pachahatar
Seventy-six	Chhahatar	Chhahatar
Seventy-seven	Sathatar	Sathatar
Seventy-eight	Athahatar	Athahatar
Seventy-nine	Unashi	Unashi
Eighty	Ashi	Ashi
Eighty-one	Yekashi	Ekashi
Eighty-two	Berashi	Bayashi
Eighty-three	Terashi	Tirashi
Eighty-four	Chaurashi	Chowashi
Eighty-five	Pachashi	Pachashi
Eighty-six	Chhiyashi	Chhayashi
Eighty-seven	Satashi	Satasi
Eighty-eight	Athashi	Athasi
Eighty-nine	Ninanbai	Unannabbe
Ninty	Nabe	Nabbe
Ninty-one	Yekanbe	Ykanbbe
Ninty-two	Beranme	Beranbbe
Ninty-three	Teranme	Teranbbe
Ninty-four	Chauranme	Chauranabbe

Nirty-five	Panchanme	Panchanabbe
Ninty-six	Xiyanme	Chhayanabbe
Ninty-seven	Santanme	Santanabbe
Ninty-eight	Athanme	Anthanabbe
Ninty-nine	Ninanme	Unansaya
Hundred	Sau	Saya

Appendix IV

Name of 12 months in Tharu Language

S.N	Months In A.D.	Months In B.D.	Months in Tharu Language
1.	Jan/Feb	Magh	Magh
2.	Feb/March	Falgun	Fagun
3.	March/April	Chaitra	Chait
4.	April/May	Baishakh	Baishak
5.	May/June	Jesth	Jeth
6.	June/July	Ashadh	Akhar
7.	July/Aug	Srawan	Saun
8.	Aug/Sept	Bhadra	Bhadau
9.	Sep/Oct	Ashoj	Ashin
10.	Oct/Nov	Kartik	Katik
11.	Nov/Dec	Mangsir	Aghan
12.	Dec/Jan	Paush	Push

Appendix V

Name of seven days of Tharu Language.

S.N	English days	Nepali days	Tharu days
1.	Sunday	Aaitbar	Raib
2.	Monday	Sombar	Som
3.	Tuesday	Mangalbar	Mangal
4.	Wednesday	Budhabar	Budh
5.	Thursday	Bihibar	Braspait
6.	Friday	Sukrabar	Sukar
7.	Saturday	Sanibar	Sain