

**PROBLEMS ENCOUNTERED IN USING COLLABORATIVE TEACHING METHOD**

**A**

**THESIS**

**BY**

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**A THESIS PARTIAL FULFILLMENT OF THE REQUIREMENT**

**FOR THE DEGREE OF MASTER OF EDUCATION**

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शिक्षा शास्त्र केन्द्रीय विभाग  
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**Prof. Dr. Bed Raj Acharya**

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**LETTER OF APPROVAL**

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By

**Dhan Bahadur Rawal**

Entitled

**“Problems Encountered in Using Collaborative Teaching Method”**

has been approved in partial fulfillment of the requirements of the Degree of  
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### RECOMMENDATION FOR ACCEPTANCE

This is to certify that Mr. **Dhan Bahadur Rawal** has completed his M. Ed. thesis entitled “**Problems Encountered in Using Collaborative Teaching Method**” under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, and Kathmandu, Nepal. I recommend and forward his thesis to the Department of Mathematics Education to organize the final viva-voce.

.....  
**Prof. Dr. Bed Raj Acharya**

(Supervisor)

**Date:** .....

**DEDICATION**

*This thesis is dedicated to my father **Mr. Thire Rawal**,*

*my mother **Mrs Chandira Rawal** , and my wife **Mrs.Nisha Rokaya***

*Whose love, support, and encouragement have enriched my soul and inspired me to*

*Complete this research.*

## **DECLARATION**

This dissertation contains no material which has been accepted for the award of another degree in any institution. To the best of my knowledge and belief, this dissertation contains no material previously published by any authors except due acknowledgment has been made.

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Dhan Bahadur Rawal

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Dhan Bahadur Rawal



## ABSTRACT

This study focuses on the problems encountered in using collaborative teaching method. The objectives of this study were to explore challenges in applying collaborative learning method in mathematics classroom and to explore the best practices of collaborating teaching method in mathematics classroom. It is ethnography approach and qualitative in nature.

This study was conducted with the sample of one school from public selected by purposive sampling. I was choose two students from grade nine, among them one boy and one girl. I also chose two students from grade ten, among them one boy and one girl. Two mathematics teachers and head-teacher were also select from shree Saraswoti secondary school selected by purposive sampling. All together seven participants in my study and interview with students, head teacher, math teacher and parents were taken. Classroom observation was done for two times with different days during teaching learning activities. The collected information from teachers and students were analyzed with the help of theoretical and conceptual framework developed by me.

In this study I have found that positive interdependence in collaborative classroom, individual accountability, student's encouragement and motivation in Collaborative Classroom and students centered in collaborative classroom. Challenges faced by teachers and students were Mathematics anxiety, traditional learning teaching activities in collaborative classroom, gender diversity in collaborative classroom, Individual difference among students collaborative classroom. The collaborative approach in teaching learning of mathematics among students and teachers is more suitable in Nepalese context for this; we should minimize the challenges of applying collaborative learning.

Finally it is conclude that collaborative learning method is more effective than traditional method in teaching mathematics at secondary level. Collaborative learning method better motivates students to learn, helps students to understand and perform better in achievement test over traditional method in teaching learning mathematics. Collaborative learning has its significant role for the students to understand the contents or subject matter or different issues/problems in learning process. For the meaningful result, proper practice of collaborative learning is required. Even though, there are challenges of practicing collaborative learning.

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## CHAPTER I INTRODUCTION

This chapter begins with its introductory part, highlighting the background of study, statement of the problem, objectives of the study, justification of the study delimitation of the study and definition of the related terms.

### **Background of the Study**

The word "Mathematics" has been taken from a Greek word "Mathema" which is derived from "mathanein" means "to learn". Mathematics is an essential part of civilization. It was originated together with the origin of human civilization. So, the history of mathematics is the history of civilization. Mathematics understands as an essential for better living in modern scientific and technologically changing society. Collaborative learning is an educational approach to teaching and learning that involves groups of students working together to solve a problem, complete a task or create a product. "Collaborative learning is based on the idea that learning the grouping and pairing of students for achieving an academic goal has been widely researched and advocated throughout the professional literature (Gerlach,1994). The term "collaborative learning" refers to an instructional method in which students at various performance levels work together in small groups towards a common goal. (Johnson and Johnson 1986). The shared learning gives students an opportunity to engage in discussion, take responsibility for their own learning and thus become critical thinkers (Totten, Sills, Digby, and Russ, 1991). The advancement in technology and changes in the organizational infrastructure put an increased emphasis on teamwork within the work force workers need to be able to think creatively, solve problems and make decisions as a team. "The present research was design to study the effectiveness of collaborative learning as it relates to learning outcomes at the college level, for students in technology among themselves" (Gerlach, 1994). It is through the talk that learning occurs. Collaboration between learners may be part of student-centered learning method like direct instruction. For example, a discussion between students helps them to better process for new information. Characteristic of these discussions helps them to better process new information. According to Johnson and Johnson (1990) to achieve success in learning mathematics, students should be given the opportunity to communicate mathematically, reasoning mathematically, develop self-confidence to solve mathematics problems. One of the ways this can be done is through cooperative learning. In cooperative learning, students study in

small groups to achieve the same goals using social skills. Many studies show that cooperative learning can improve performance, long-term memory and positive attitudes towards mathematics, self-concept and social skills.

Collaborative learning is a method where students work together in groups that are small enough so that everyone can participate on a collective task that has been clearly assigned (Cohen, 1994). As Smith and Macgregor (1995) state, in collaborative classrooms, the lecturing note-taking process may not disappear entirely but it lives alongside other processes that are based in student's discussion and active work with the course material. Collaborative learning is an umbrella term for an educational approaches involving joint intellectual effort by students, or students and teachers together. Barabaleigh Smith and Jean. T. Mac Gregor (1990), argue that collaborative learning activities vary widely, but most center on students exploration or application of the course material, not simply the teacher's presentation or explication of it. Collaborative learning represents a significant shift away from the typical teacher centered or lecture centered milieu in college classroom.

Collaborative learning has attracted a great deal of interest since the last two decades to the 20th century (Do Rnyei, 1997 and Marin, 2007). Other than its proved academic advantage collaborative learning also faces skepticism for its transient quality (Themes and Perry, 1998). The failure of a collaborative learning activity can be attributed mainly to collaborative learning activity can be attributed mainly to collaborative learning problems group tension. The free-rider effect may eventually let a collaborative learning activity go against its purpose participating and learning for all groups members. To avoid these collaborative learning problems, researchers suggested conditions for effective collaborative learning such as mutuality; interdependence, and equality among group members (Damon and Phelps, 1989 Dill)-Research have started to investigate collaborative learning through the prism of identity in recent years. Identity Saliency theory is one of the identity theories that have been explored. Identity saliency theory claims in dual relational and collective identity saliency (Brewer 1996).

Most of the studies on collaborative learning take constructivism, especially the origins from Piaget and Vygotsky, as the theoretical underpinning of peer collaborative learning because they focus on making meaning through social interactions. Scholars of collaborative learning believed that collaborative learning can help students accomplish individual, by leveraging knowledge, as well creating circumstances for participants to help each other (Hardy

2005). The main purpose of the study was to explore the challenges faced by teachers and students in teaching and learning mathematics in collaborative learning method in teaching mathematics. Further, the pedagogies they used were found collaborative learning using Nepal. Mathematics has been conceived as a difficult subject and hence this hegemony may have? Contributed to creating problems in mathematics teaching collaborative learning method in teaching mathematics.

It has come to hear that mathematics is very hard, complicated, irritating, time consuming and boring subject, but I am fully beyond of that assumption. In my opinion mathematics neither hard, nor complicated it is beauty subject. It is simplest and clearest way of thinking of calculation, means of increasing logical ability of learner. It is like as game, which is played by different players and all players fill very enjoy. There is need of mathematics learning strategy. Mathematics learning through many types learning then collaborative learning is most useful learning one of them. This research will be identifying the situation of mathematics learning practices in Nepalese. A noticeable observation in the classroom is big gap between theory and practice of collaborative learning method. Collaborative learning method practices are not being developed according to the demand of collaborative method.

### **Statement of the Problems**

"Nepal is a multicultural, multi religious country with various language so, a teacher must know special instructional issues to accommodate students from different cultural background" (Acharya, 2014). In collaborative classes, opportunities should be provided to everyone and as a result they can analyze and evaluate mathematical thinking and strategies of other. In collaborative classrooms the cross cultural communication and collaborative revues are very essential. Basic and action research are necessary to address the problem of those classroom. Children should be allowed to construct and express mathematical ideas on their own way. Local curriculum introduced in primary level is also a very brilliant idea. The integration of student's mathematical tradition and games in the teaching program is very essential. This whole research is intended to find the problems that the teacher and students fell inside the collaborative classroom.

Collaborative learning is grounded in constructivist theory. Knowledge is discovery by students and transformed into concept students can related to reconstructed and expanded trough new learning experiences. The learning consists of active participation by the student's verses

passive acceptance of information representation by an expert lecture. Learning comes about through transaction and dialogue with their peers. collaboration is a philosophy of interaction and personal life style where individuals are responsible for their actions, including learning and respects the abilities and contributions of their peers; individuals is structure of internalization of knowledge designed to facilitate the accomplishment of a specific and product or goal through people working individually. Before we proceed with the theoretical underpinning of each method. It would be helpful to describe the differences between the two paradigms in terms of an actual class. This whole research is intended to find the problems that the teacher and students fell inside the collaborative classroom.

This study has solved the following research questions:

- ) What are the challenges faced in collaborative learning method in classroom?
- ) What are the best practices of collaborative method in mathematics classroom?

### **Objectives of the Study**

The objectives of the study are follows:

- i. To explore challenges in applying collaborative learning method in mathematics classroom.
- ii. To explore the best practices of collaborating teaching method in mathematics classroom.

### **Research Questions**

The research questions of the study are follows:

- ) What are the challenges faced by students in collaborative learning method in classroom?
- ) What are the best practices of collaborative method in mathematics classroom?

### **Justification of the Study**

Each study is important for the institutions, scholars, professors, students and the researchers who are interested in this area. The language is a means of two way communication. During the teaching leaning process of mathematics the language plays a vital role. The problems faced by the teachers and students due to the collaborative nature of the classroom are the man quest of this research. What kinds of teaching learning materials, predations and continuous were taken to the teacher are the main findings of this study. The genuine problems and its intensity among teachers and the finding of its research.

This study was the following Significances in the teaching and learning strategy of mathematics:

- ) It helps the teacher to organize his/her experience in appropriate and learning strategies.
- ) It helps to develop an effective instructional planning.
- ) It gives a model of innovative instructional planning and learning
- ) This study provides the important information to the instructor in applying collaborative learning method.
- ) It was helpful for national policy maker, mathematics curriculum, administrators, and all other concerned personal dents to it.

### **Delimitations of the Study**

The delimitation of the study is as follows:

- ) This study was delimited in secondary level of shree Saraswoti Secondary school, Shivalay-6, Jajarkot.
- ) This study was delimited only the secondary level students.
- ) The study was based on qualitative analysis.
- ) This research only covers the students and teachers who were involved in teaching learning process of mathematics in secondary level

### **Definition of Key Terms**

**Collaborative Classroom.** The study classroom in a public school where students from various ethnic grounds, social strata and economic structure come for educational purpose school. The pubic place where student learns the various skills and the teacher teaches.

**Teaching Learning.** An activity done inside a classroom for gaining and sharing of knowledge based on a fixed curriculum.

**Secondary Level.** The level containing grade 9 and 10 in Nepalese school system.

**Challenges.** Challenges to the problem faced during a certain period or process. The challenge refers to the difficult to the students from diverse ethnic community to clean the lessons. The challenges that refers to the problems faced by the teacher to make students learn.



**Teacher.** In this study teacher means person who is teaching secondary level mathematics.

**Contributes.** Collaborative learning settings address many of the concerns that teachers have and their ways to classroom, education research points out the great contribution of collaborative learning to academic and social fields of the learning process.

**Collaborative learning.** Collaborative learning is a situation in which two or more people learn or attempt to learn something together.

## CHAPTER II

### REVIEW OF LITERATURES

This chapter is related with empirical literature, theoretical and conceptual framework of the study. A collection of body of work done by earlier scientists is technically called the literature. Review of related literature is essential part of the research because it helps to identify variable relevant to research. This chapter includes the different features of article and findings of different researches in the fields of mathematics education especially related to contribution of collaborative learning method in teaching mathematics, challenging in applying collaborative learning. The main purposes of relate literature is to develop some expertise in one's area to see what new contribution can be made, receive some idea for developing research design in a systematic manner by providing the general outline of the research study. This chapter deals with the works carried out in the area of this research project, theories and interpretation ever found. The literature reviewed were previous thesis, books, journals and internet resources. I reviewed the literature organizing empirical and theoretical.

#### **Empirical Review**

NCTM (2000) principals and stands for school mathematics are the equality principals and stands for school mathematics are the equity principle. Excellence in mathematics education requires equity high expectations and strong support for all students. Achieving this goal requires raising expectations for students learning developing, effective methods of supporting the learning of mathematics by all students regardless of their personal characteristics backgrounds or physical challenge must have opportunities to study and support to learn mathematics. Technology can assists in achieving equity and must be accessible to all students (Vaugh and Schumm, 1995, cited in Acdlister (2002)

Each and every research work requires the knowledge of precious background to open the targeted objectives and to validate the study. Here, this section is an attempt to new view the related studies, articles and reports. Some of the old theirs has been reviewed considering them as a related literature and also as evidence to the present study.

Bhudhathoki (2004) did an experimental research on "Effectiveness of co-Operative Learning Methods in Teaching Mathematics at Secondary Level." His aims was to find out the co-operative learning method is more useful than traditional method. K.C. (2006) did research on

"Effectiveness of Co-operation Learning Method in Teaching Geometry at Primary Level" His aimed to examine the co-operative learning is more effective than conventional in teaching geometry at primary level.

Bhatta (2012) has also compiled an M.Phil case study research on the topics "Classroom Particle at Primacy Level: A Multicultural Perspective". This site of the study was Gram sewa higher secondary school of Kathmandu district. He selected participants by using purposive random sampling method. His study was focused on ten teachers, twenty-four student and six guardians concerned to Gram sewa school. He used both questionnaire and interview to collect data from the participants to fulfill the objectives of his study. The main objectives of his study were to indentify the situation of primary school students from multicultural per respective and to find out the practices of teaching in multicultural classroom setting. He found that teacher have applied teaching rather than group teaching to address the issue of multicultural setting. He further found that the teachers were unable to address all the students equally though extracurricular setting. In a nutshell, he ground that classroom practices at primary level were not culturally responsive and relevant.

Karki (2013) Carried out the research on the topic "Teaching Learning Mathematics Through Collaborative Approach. :An Autoethnographic Inquiry." The main purpose of his inquiry were provide a personal account of one mathematics learner's to a novice teacher use of reelecting teaching learning as an agent of change. It focused on pedagogical growth and change that he has witnesses from my early years of profession as a primary teacher.

Bhatta (2014) has also conducted a research on the topic. "Pedagogical Process of Mathematics Teacher in Ethnically Plural Classroom is Secondary Level". The objectives of this study were to explore the management practices of secondary teachers manage diverse class and to investigate the learning needs of different group of students. The study was limited in ten surrounding secondary school in Kanchanpur district. He selected 50 secondary students and the ten teachers for his study. Interview, observation and the questionnaires were the tools to collect the data for his study. He concluded that disconnected teaching activities and traditional oriented teaching methods and material where mostly applied by secondary teachers in their classrooms. He further found that lack of knowledge in mathematics has also a barrier to make all the students equally involved in the classroom.

Pandey (2016) has also compiled a research on the topic. "Adversities in Teaching Learning Secondary Level Mathematics in Cultural Diverse Classroom" It is changing to teach multicultural students in Nepalese context. It has become essential to find appropriate way of teaching and appropriate materials to meet the need of multicultural mathematics students. Diverse cultural classrooms do have diverse experience from the teachers so that he/she should be aware of the diversity of classroom. To understand the real cultural background of the students a teacher must have knowledge of their linguistic communication cultural traditions and their genders problem.

### **Theoretical Review**

The effects of an individual help not only the individual to be rewarded, but also others in the class. Language acquisition is facilitated by students interdicting in the target language. Responsibility and accountability for each other's learning is shared. The teacher give feedback on the tasks from a tasks based approach to language instruction for instanced cooperative learning is similar to learner strategy training, when I went through (Taylor, 1997). I found that there are several approaches in the collaborative learning and all of them that apply students lined experience from which they continue to learn.

### **Vygotsky's Theory**

The constructivism of Vygotsky emphasizes the real culture background of the learners which he terms as 'experience'. The radical construction is noted as. It is an unconventional approach to the problems of knowledge and knowing It stands from the assumption that knowledge no matter how it is defined, is in the heads of persons that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience. (Sharma, 2011). This view of Vygotsky's radical constructions prioritizes the role of collaborative background in the process of learning. This view also develops the role of objective in front of subjectivity. The view of Vygotsky is also described as.

Vygotsky (1978) 'also highlighted the convergence of social and practical elements in learning by saying that the most significant moment in the course of intellectual development occurs when speech and practical activity, to previously completed occurs when speech and practical activity, to previously completely independent lines of development, converge, thought practical activity a child constructs meaning on an intrapersonal level, while speech connects this meaning with the interpersonal world shared by the child and her/his culture. Through the

process of scaffolding a learner can be extended beyond the limitations of physical maturation to the extent that the development process lags behind the learning process. (Shrestha, 2010.)

The above line clearly the important of practicality in learning. For Vytotsky the collaborative of the practicality and theoretical context only can make a better learning. The learning only can be possible when the learner able to connect in learning language that.

The theme of Vygotsky's work is that learner's cognitive development takes place in a social context. Throughout their learners are surrounded by the parent's siblings, relatives, friends, teachers and fellow students they communicate with one another and stimulate one another. Parents and teachers, in particular are more knowledgeable and skilled than learners and learners acquire knowledge about their culture and culture and history from their encounters with adults, peers and the media. This cultural knowledge in clouds shared believes, ways of viewing the world patterns of interacting with people and language. (Pradhan, 2015)

### **Social Critical Learning Theory**

Critical theories from the very first, experiences impressed in abolition of social justice in learning opportunities provided in the school, community an even in the family. Actually it is social theory oriented towards critiquing and changing society as a whole in constrict to traditional theory oriented only in understanding explaining it. In other words it is the examination and the critique of the society and the drawing from knowledge across the social science and the humanities. Moreover, social critical learning theory discusses about gender insure, discontinuity, power of teachers in classroom etc. It studies how these factors affectors in teaching learning proces (Acharya, 2015).

### **Transformative Learning Theory**

In my research this transformative learning help to conduct a literature review for my research. When I attempted to conduct my research in collaborative approach I was notable to get change to use the collaborative approach in my teaching learning.

Thus, in my research students have got change to participate in learning mathematics.

Transformative learning (mezriow, 1991, 1995, 1996 carton, 1994, 23 1996) is the process of effective change in a frame of reference. More ever transformative learning informative as and in which those participative have full information, are free from coercion, have equal opportunity to assume various roles and are willing to search for common ground or synthesis of different point of view.

## **Collaborative Learning Theory**

When I would through Taylor (1997) I found that there are several approaches in the collaborative learning and all of them that apply students lined experience from which they continues to learn. Collaborative learning is mostly defined as "A situation in which two or more people learn or attempt to learn something and more specially as joint problem solving" (Dillenbourg, 1996) Roschelle and Teasley advocated collaborative more specially as "Mutually engagement of participation in a coordinated effort to solve a problem together", (as cited in Dillenbourg et al 1996). In collaborative approach we work together to accomplish shared goals. The effects of an individual help not only the individual to be rewarded, but also others in the class. Language acquisition is facilitated by students interdicting in the target language. Responsibility and accountability for each other's learning is shared. The teachers give feedback on the target social skill cooperative learning groups can easily work on the tasks from a tasks based approach to language instruction for instanced cooperative learning is similar to learner strategy tainting as well in that both require language to teach other skills in addition to teachings languages. There were several procedures to teach students by collaborative method, such as group investigation, learning together (LT), Academic Controversy, Team-Game Tournaments (TGT), Students Team achievement Division (STAD) etc. However, researcher selected students Team Achievement Division (STAD) method to teach the group because it is the simple of all other method.

### **STAD (Student Team Achievement Division)**

STAD is a cooperative teaching method which was developed by slavin (1978) as part of a student learning approach program along with other cooperative methods such as aTeam-Games-Tournament, Jigsaw II (Sahin 1980), and Team Assisted Individualization (Slavin et al 1981). In STAD, students are assigned to four or five members learning teams. The teams are composed of high average and low performing students and boys and girls of different racial or ethnic background. There are five main steps a teacher should follow when STAD is implemented.

In STAD, detailed are as follows:

- ) Class presentation

- ) The formation of the study groups
- ) Provision of Test or Quiz
- ) Improved scoring individual
- ) Award group (Team Recognition)

### **Class Presentation**

The teacher presents the material in front of the class in the classical style that focuses on the concepts of matter to be discussed only. Furthermore, students are asked to learn in small group to work on tasks assigned by the teacher.

### **Provision of test or quiz**

After studying the group completely the test, quiz was held with the objective of identifying or the ability to measure student learning of the material has been studied. In this case, the student was not allowed to work with his friend. The purpose of this test is to motivated students to try and individually responsible.

### **Improved scoring individual (Individual Improvement scores)**

This is done to give the students a goal that can achieved if they work hard and showed good results compared with previous results. Manager scores the results of the cooperation of the students performed in the following order : score early, score tests and score of the group increased.

### **Award Group (Team Recognition)**

Award is given to the group to give a gift in appreciation of the efforts that have been made during the study.

### **Filling the Gap**

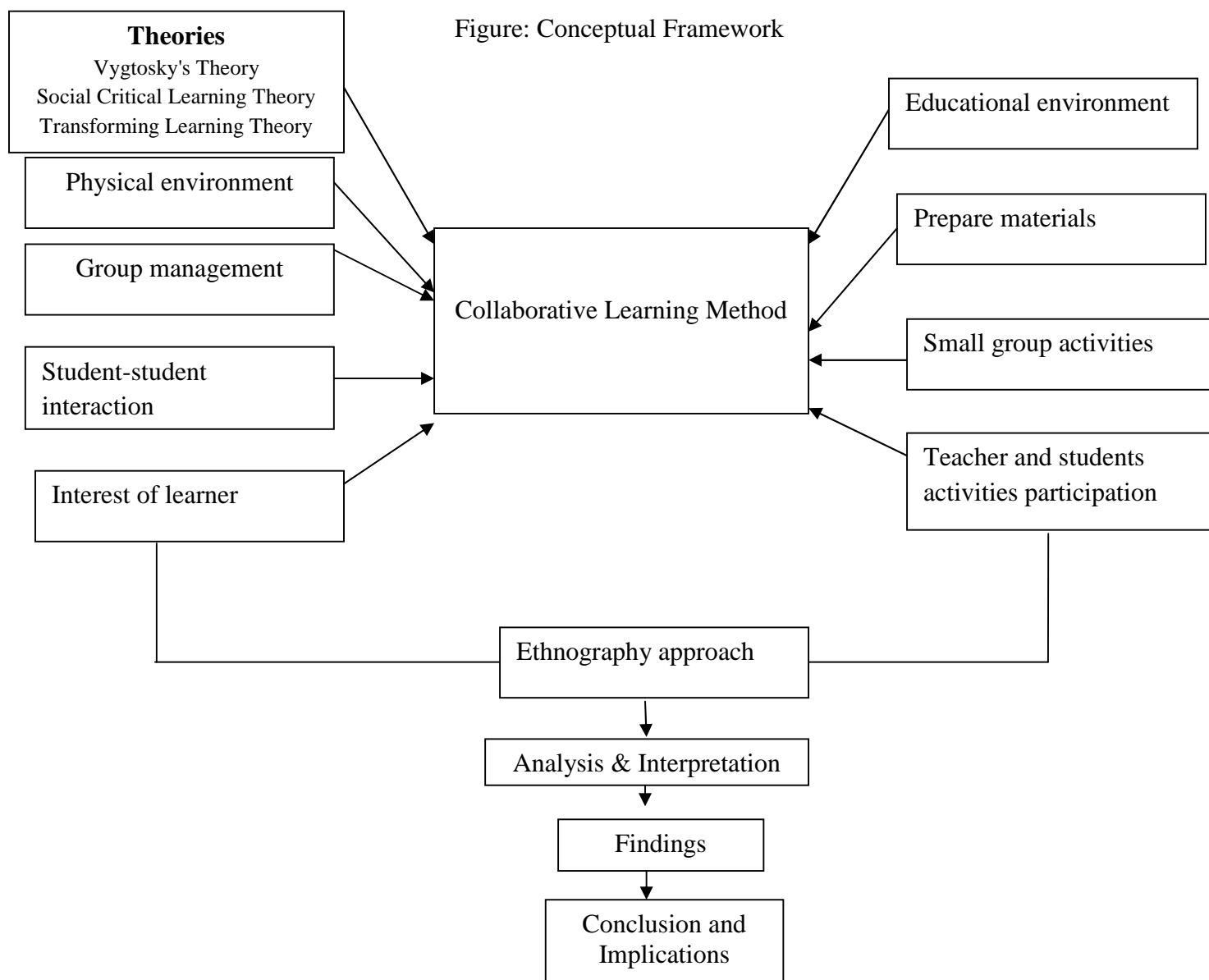
Though various researchers have been made in for and against the different learning theories there is the scarcity of research in the field of research on “the problems faced by teachers and students inside a collaborative classroom.” Very few researches have been carried in this area. This research filled the gap between the theoretical perspectives and practices. This research aims to study the genuine nature of the problem through the classroom observation. So, I believe my title for this dissertation is suitable for carrying out a research.

## Conceptual Framework

The conceptual framework devised through the literature studies facilitate of achieved the research objectives to get the answer of the research question and carryout the research work as a whole smoothly. Analyzing various literatures in relation to adversities encountered in teaching learning activities. I have developed a framework to complete this research that is shown below.

The study is on “Collaborative Learning Method in Mathematics Learning” was based on following conceptual framework.

Figure: Conceptual Framework





### **CHAPTER III**

#### **METHODS AND PROCEDURES**

This chapter described how the study was conducted to fulfill the objectives of the study, so methodology is the most important part of the research. This chapter deals with procedure of the ethnography method. So the researcher selected qualitative research for the study. This chapter gives the clear and concrete direction to answer the research questions.

#### **Research Design**

Research design is the specification of the method and producer it is also a way of the research that present a way for the researchers to achieve the goal of the research. Research framework is divided from research design. This study focuses on the problems faced by the teachers and students in collaborative classrooms of Jajarkot. This is a research was based on qualitative with ethnography approach.

#### **Ethnography Approach**

Ethnography approach is a specific form of qualitative inquiry; it enables us to research the realities embedded in a social-cultural setting. It helps to understand the cultural world of the research from their perspectives. Further, it intends to capture detailed and in-depth description of everyday life practice of people (Hoey, 2014, as cited in Rai, 2015). Ethnography focuses on an entire cultural group. Ethnography is qualitative design in which the researcher describes and interprets the shared and learned patterns of values, behaviors, beliefs and language of culture shaping group (Harries, 1968, cited in Creswell 2000). The central aim of ethnography is to provide rich, holistic insights into people's views and actions as well as the nature of the location they inhabit, through the collection of detailed observation and interview (Reeve, Kuper and Hodges, 2008). In this study, I had chosen the ethnography approach because of my research objective and research questions. My objectives of this study were to identify the collaborative teaching contribution to learning mathematics classroom and to explore the challenges in applying collaborative learning method. I thought that only the ethnography approach could fulfill my objectives. So, I applied this approach in this study.

Qualitative research in collaborative methods involving an interpretative neutralities approach to its subject matter. This means that qualitative researcher study things in their natural settings attempting to make sense of or interpreted phenomena in terms of the meaning people bring to them (Denzin and Lincoln, 2000 cited in Acharya 2013). The qualitative approach that is

used in the observation to the classrooms. The analysis and finding consists the qualitative approach. The study however around the problems faced by the teachers and students during teaching learning activities of secondary level mathematics.

### **Study Area**

The research area selection is also a very important task for the study in order to obtain easy access, establishing immediate rapport with informants and gathering data directly related to the research objectives. Every study needs study area; researcher was choose one public secondary schools of Jajarkot district the name of school is shree Saraswoti Secondary school, Shivalay-6, Jajarkot. I have a convincing reason for selecting the school that it is located where the culturally diverse students are studying. The school was established in 2032 B.S. At the present there were 15 teachers including head-teacher. The school had the classes from 1 to 10 with 350 students. The students of this school were from diverse community. Most of them were indigenous and some were from Dalit community.

### **Sample of the Study**

First, I had visited to school and I meet head-teacher. I was tell all about my study, and I give my research proposal. After that, the head-teacher agreed to give permission for me. He inform for all teachers about my study. I was take permission to observe grade nine and ten. After continue five days class observation, I was choose two students from grade nine, among them one boy and one girl. I also chose two students from grade ten, among them one boy and one girl. Two mathematics teachers and head-teacher were also select from shree Saraswoti secondary school selected by purposive sampling. The selection of this particular group of students were base on their different social and cultural backgrounds, their willingness to participate in the study, their parent's interest and supports for the study and their different levels of mathematical understanding. I used the purposive sampling technique for the selection of participants

### **Data Collection Tools**

The study intends to find the affecting factors behind the cultural diversity in learning mathematics in governmental school. To fulfill the purpose of the study different tools was select for data collection. Thus, the observation notes, in-depth interview and document analysis used as tools for the data collection

**Observation.** Observing in a setting is a special skill that requires addressing issues such as the potential deception of the people being interviewed, impression management, and the potential marginality of the researcher in a strange setting (Hamersley and Atkinson, 1995; as cited in Creswell, 2007). Observation is a kind of tools that helps to seek knowledge through the use with sense i.e. eyes, nose, tongue, and skin. It has great importance not only in research work but also in our daily lives. (K.C, 2000; as cited in Adhikari, 2007) writes that direct observation has the advantages of putting researchers into first hand contact with reality. In this study, observation used to capture the physical setting that is the physical environment of school and classroom, the human setting that is the organizations of students in the classroom and interaction setting that is the participation as well as interaction of teachers with students and vice versa.

Observation guideline developed with reference to research objectives. The teachers would be pre-informed about the purpose of observation and their permission was taken before entering into the classroom. My roles during the observation was that of non-participant observer noting down the things as it occurred and making notes of the things that were noticed. Observation helped me in collecting detail information about respondents, their everyday practices and capture actual experiences of the participants. Since, the Nepalese classroom constituted by different socio-cultural forces because students from different background have their own lived reality and in the classroom, they are not simply conform norms and values of the school. To get required information regarding mathematical concepts, I observed school overall as well as key respondents individually and collectively during their work at school, classroom, playing with peers, interacting with teachers and friends, school behavior, culture, and participation. I observed teachers collaboration and discussion in subject matter, participation of students in classroom activities as well as extracurricular activities in terms of gender, caste, religion etc., teacher's behavior towards students in teaching learning process, and teaching learning strategies of teachers and students.

**In-depth Interview.** Interview is a two-way interaction between researcher and researched as in the form of interviewer and interviewee in which interviewer creates situations that can attract the attention of respondents for a enough period of time in asking questions and answering the questions which interviewee puts his/her understanding and meaning (Wikipedia). Kerlinger (1986; as cited in Adhikari, 2006) describes interview as face to face interpersonal role

situation in which one person, the interviewer, asks a person being interviewed, the respondent and questions designed to obtain answers pertinent to the purpose of the research problem. In-depth interview also known as unstructured interview could be regarded as informal interview. It was used to discover the in-depth understanding of people in the context under the study (Bailey, 1982; as cited in Adhikari, 2006). It can be done in a day to day conversational way in which interviewer does not know whether s/he had been interviewing or not. This interview helped to create a friendly situation that opens up a free feeling environment for both researcher and respondent.

In this study all, the required information was not possible to gather through the observation and documents. To go in-depth of the information interview was much more helpful. So, I carried out open ended interview to clear his/her difficulty regarding learning mathematics. Since some questions had raised according to the situation available. I took in-depth interview of all four key students using unstructured questionnaires. After the interview of the key students, I had also take the interview of head-teacher and two mathematics teachers.

**Documents Analysis.** The review of documents is an approach, which researchers use to gain a detail understanding of the setting analyzing the content of a given document (Bajaracharya, 2009). Document analysis is an inquiry, which review yield experts, quotations or entire passage from records; memorandum, publication are reports (Best & Kahn, 2004; as cited in Bajaracharya, 2009). In my study, research reports/dissertations (as stated in reference), various journals and articles helped me to identifying the guideline for observation and components for interview as well as arriving at the research objectives.

### **Quality Standards**

After completing the construction of the research tools, it is necessary to maintain quality standard. For quality standard, I used cross match, triangulation, member checking, prolong stayed in the field. For quality standard, I followed the following ways:

**Credibility.** This concept replaces the ideas of internal validity, by which researchers seek to establish confidence in the truth of their finding. To maintain credibility of my research I tried to spend as much time as the observation needed and engaged with different people with their work. After getting information I wrote notes, I asked similar types of questions to others people and tried to find real practices from those information.

**Transferability.** Transferability replaces the concept of external validity. This criterion refers to the applicability of finding in one context (where the research is done) to other contexts or setting (where the interpretations might be transferred). To maintain transferability I explained mathematical practices found in different community students briefly. I had try to capture most of scenario by using thick description of observation, interview and my meaning making.

**Dependability.** This concept replaces the idea of reliability. This is the third standard for judging qualitative standards and refers to stability or consistency of the inquiry processes used over time. To maintain it I presented the logic used for selecting people and events to observe, interview and include in the study. I would try to maintain credibility and transferability to ensure dependability standard.

**Conformability.** A fourth standard is conformability, which refers to the quality of the results produced by an inquiry in terms of how well they are supported by informants who are involved in the study and by events that are independent of the inquiry. This is sometimes referred to as the audit trail (a record of how decisions were made throughout the study). I am also the part of students, so, to maintain conformability before concluding information I reviewed that information myself several times and sometimes I conform that information to my other students/friends before concluding information as well.

### **Data Collection Procedure**

Data collection refers to gathering information from vivid sources through the application of multiple data gathering methods to attain the objectives of the research under consideration (Niure, 2014). For this study, the data and information was collected using tools as observation, in-depth interview and documents analysis and so on in order to collect information the respondents. To collect the primary and secondary data, class observation had done regularly during teaching learning activities. I observed, listening, interaction and recorded the essential data from the information on the basis of observation from classroom behavior, interest, and needs in mathematics learning. With the help of semi-structured interview schedule and questionnaire, the in-depth interview wastaken with key students, mathematics teacher and head teacher. The interaction with the respondents was carefully listened and recorded properly. Related documents also reviewed and analyzed on the basis of need. The data from interviews consists of direct questions to people about their experiences, opinions, feelings and knowledge. The data from observations consists of detailed description of people's activities, behavior,

actions and the full range of interpersonal interactions and organizational processes that of observational process, human experiences. And data from document analysis consists of expert's quotations, program records, memorandum and correspondence, and reports, personal diaries and open-ended written responses to questionnaires and surveys (Creswell, 2007).

### **Method of Data Analysis**

Data analysis in qualitative research consists of preparing and organizing the data for analysis, then reducing the data into themes through a process of coding and condensing the codes and finally representing the data in figures, tables or a discussion (Creswell, 2007). In my study the collected data were analysis by using (Thomas, 2006) general inductive approach. From this approach first the data were transcribe coding, categories and at last making themes. The data collected through above mentioned tools from different respondents and sources were processed in different steps. First, the data from interview in the tape recorder was translated in English. The writing and reading of transcripts were allowing me to generate common codes and themes as well as the issue that have anticipated. Further, this coded sentences that expressed similar meaning would be segmented into common categories. Finally, after revising those categories, smaller specific themes in line with the research questions will be generated. For the purpose of analysis, the themes were analyzed for answering the research questions. The important paraphrases with same meaning would bring together and summarized to support the argument whereas less relevant passages with same meaning will skip for the ease of analysis. Cross match or triangulation adopted to maintain the validity and reliability of the results of the study. Mainly the three sources of the information triangulated in classroom observation, teaching learning styles of mathematics, and interview with head-teacher, mathematics teacher and key students in addition with field notes. Then after, with the help of theories the analyzed texts were interpreted and summarize. Thus, analysis of the statements from the specific themes will be done and theories would use to interpret the meaning, values, experiences, opinions and behavior of respondents from the analyze themes and answer the research questions. The data analysis and interpretation part will be divided in three sections on the basis of research questions. The first section discusses about the cultural diversity in Nepal and causes of difficulties in learning mathematics of culturally diverse students at school. The second section explains the relation between culture and learning mathematics. The third section discusses about effective pedagogy for culturally diverse classroom.

**Ethical Considerations**

If any kind of research involves the person, special attention should be paid to the person's rights, dignity, freedom, and privacy (Khanal, 2019). The ethical considerations of my study where I observed the classroom only to take the permission with the subject teacher of related school, interviews will be conducted only after giving all the prior information to the participants about the study and getting their approval, data has not been collect for my personal gain and my personal benefit, respecting the diversity in school the data were collect in a biased manner, comfortable language used in the data collection process for easily understandable to the participants, and at last name & address of participants have been published in the statistics only with their approval.

## CHAPTER IV

### DATA ANALYSIS AND INTERPRETATION

The interpretation of analyzed data was done using different theoretical perspectives as explained literature review section. This chapter deals with analysis and interpretation of the collected information. The researcher visited the school, parents and students. Researcher takes the responses of the respondent during the face to face interview were carefully noted. The researcher had observed mathematics class with math teacher during teaching learning activities. Then, the classroom observation note was prepared on the basis of the class observation. Every activities and behaviors of the students were carefully observed and noted. The responses of the respondents during faced to face interview were carefully noted. They were able to express freely whatever they have in their mind to analyze the data. First he collected information were categorized according to different themes given in the vent of interview.

There was no limitation to responses for respondents. They were able to expresses freely whatever they have in their mind. To analyze the data, first collected information categorized according to different themes given in the text of interview. The observation note and themes were considered as code and the similar code version of the respondents were collected and explained in their perspectives.

For this, this chapter is organized into two sections. Section I discussed about the challenges faced in collaborative classroom and Section I discussed about the teaching learning practices in collaborative classroom.

#### **Section I: Challenges Face by Teachers and Students in Collaborative Classroom**

The data were collected from the students and teachers as main sources of the study. Data analysis is more important and crucial pant than the collection of data, can only gives a right gateway towards the problem solving.

"Data analysis, being a continuous process of reviewing the information as it is collected clarifying of formulating additional questions, verifying information and drawing conclusions is crucially important in the research process" (Grady 1991) Discussing the principles of analysis, Kerlinges (1983) write that analysis means the categorizing, ordering manipulating and summering of data intelligible and interpretable forms so that the relation of the research problems can be studied. (Uperty, Temaisina, Khada 2009. p,1129)



The data were collected from secondary level students and teachers from different schools of jakartot. The school that was taken as samples were Shree Saraswati Secondary school, sivalaya-6, jagarkot. The data were collected, grouped then searched the similarities and differences. The researcher carefully and systematical arranged to analyzed the realistic seen no of teaching learning activities in ethnically diverse classroom. The data clearly informs the behaviors and activities of teachers and students inside a collaborative classroom. The data and the information carefully analyzed and interpreted to the rightful contusion. The information from students a teacher were carefully compared and contrasted on the base of their answers and classroom observation of the researcher.

This chapter deals with the realistic interpretation regarding the following guidelines of find the fair conclusion

- ) Mathematics Complexity.
- ) Traditional teaching learning activities.
- ) Individual difference among students.
- ) Difficulties to class control.
- ) Gender diversity.

### **Mathematics Complexity.**

Math in schools has evolved tremendously over the years, and hopefully will continue to. There are many causes to the complexity, such as home life, testing, and teachers. However, there are also many solutions such as time management, skills. Mathematics Complexity has been defined as feeling of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations math anxiety can cause one to forget and lose one's self-confidence (Tobias, 1993; as cited in Curtain-Phillips, 2015). People who feel tension, apprehension and fear of situations involving math are side to have math anxiety. And, perhaps not surprisingly, math anxiety is associated with poor math performance in school. Students with a high degree of math anxiety perform worse in math form elementary school through college, relative to their less math anxious counterparts (Beilock and Wilingham, 2014).

In the data collection period, I observed the class and taken interview from students. While taking interview I asked a question, why do you feel math difficult?

In this question, "A" (student of class nine) answered that,

*"Mathematics is very difficult for me but why I don't know. I am not good in mathematics, geometry is very difficult for me, I feel bored to proof theorem, so I cannot do this truly. My mother is uneducated; my father is far from we for his job. So, there is no one to help me in my home while I am reading mathematics. I do not ask some question to the teacher because when I ask question, teacher also told me say yourself. I am feeling fear with mathematics teacher".*

In same question, " B" (student of class eight) replied that,

*"Mathematics is not too hard for me but I feel it is more difficult subject. All friends are weak in math as well as me, because we do not give more attention in classroom. I had listened that math is very difficult subject in higher level, so I do not want to study math in higher level. Our madam always teachers by using lecture method so, I do not understand clearly. I feel difficult in geometry more than other parts because there are more rules."*

Form this answer; we can say that more students are feel mathematics as difficult subject. Most of the students at school level are weak in mathematic. There are many reasons to be creating this situation. Traditional teaching learning methods is one the main causes for this. Most of the teachers use lecture method in teaching mathematics, which is not relevant for students. Students lean best when they are active rather than passive learners.

In this regards, Furner and Duffy, (2002); as cited in Smith, (2004) state that. Math anxiety is caused by poor test grades, inability unwillingness to complete difficult assignments, negative predispositions for parents, and even that mathematics teacher. Teachers and parents that afraid of mathematics pass that on to their students and children. It could be very difficult or students to like mathematics when their parents did not do well in mathematics themselves, and thus do not understand it or do not think it is important. Students could see their parents as having a job and doing well without a great love for mathematics as well. If the teacher does not value mathematics, his/her students certainly cannot be expressed to value mathematics either. Another major source of math anxiety is the teaching approach of "explain-practice-memorize" (Steele & Alfred, 1998; as cited in Smith, 2004). The mathematics teacher needs to be creative in his/her teaching methods, so students do not lose interest. Furthermore, Bourdieu (1977). Argue that the main reason for under achievement of working class children are the education systems because it reproduced the culture of dominates class, which is based. This is way the children from the working class and the income poor do not understand more and learns specific skills. Orbu (200), also argue that the children with unmatched and dissimilar home cultures with

school cultures do not have enough attention their learning and do not get much recognition of their cultures and they have to work achieving learning outcomes compared to the children with good matched.

Mathematics anxiety involves the feeling tension that can affect the ability to manipulate numbers and solve mathematical problem (Richardson,1972).Mathematics anxiety is a complex and elusive quantity that is difficult to define and even more difficult to measure (Wood,1988).The dictionary meaning of anxiety is "The state of feeling nervous or worried that something bad to is going to happen a worry or fear about something a strong feeling of wanting to do something or something happen."(Oxford,2015).It is clear that meaning of anxiety perform both positive and negative aspects and it depends upon the feeling related to pressure ,fear worry with his or her mathematical performance .(Kattel,2015)The development of mathematical anxiety may involve not only exposure to negative experiences with mathematics but also likely involves genetic risks related to both anxiety and math cognition.(Wang 2014).Mathematics anxiety is an important construct to consider when examining sources of individual difference in young children's mathematical performance (Vukovic,2013) Belief from different sources produce negative attitude towards mathematics .When teacher play role to deduce this problem in prompt the degree of anxiety comes down or can build a desire to work and think mathematically. By improving the understanding of the use of mathematics pupils will hopefully see the benefits of developing strong mathematical skills for more than just role of teacher parents and others is to articulate them positively.

### **Traditional Teaching Learning Activities in Collaborative Classroom**

A traditional learning group does not provide the structure for individual accountability. This is often a huge downfall and upsetting to those students who work the hardest in the group. Since all students are graded the same, less motivated students will allow the motivated ones to do the majority of the work. On the other hand, a cooperative learning group provides for individual accountability through rubrics, teacher observation, and peer evaluations.The traditional teaching methods are teacher-centered and include the use of lectures and discussions while the problems solving elements is presented by and or discussed with the instructor, the syllabus, the teaching material and the student assessments are determined by the tutor and transmitted to students in various lectures (Cotel& Millis, 1993; as cited in Dimitrios & et al. 2013). Still now, we can see that, most of the teachers of Nepal are using lecturer method and

rote learning while teaching mathematics. This method is not relevant to the students who are from different cultural groups.

In the class observation, I have found that, the mathematics teacher mostly used lecture method. He/she gives less chance to students in class: I also found that the teacher is solving the question and students copying and answers. However, sometimes tells students to do them self. But, this is not enough for effective classroom teaching. I had asked to the teacher why are you not give opportunity to students to do themselves?

In this matter teacher. B (Teachers views)

*"I always want to give more opportunity to the students to do problem on whiteboard, but this its process I couldn't finished the course and it is problematic for me. However, I am giving chance sometimes"* It shows that, still teachers have traditional belief on teaching learning activities.

They feel easy to teach by using lecture methods, but it is injustice for students. The traditional methods cannot give equity in classroom. In the classroom occupy with diverse students need multicultural classroom teaching. For this, teacher needs to understand the different views of different students who are come from different cultural groups. If possible teacher needs to teach mathematics by connecting daily life of students.

In this regards, Vygotsky's (1978), as cited in Acharya, (2015) voice that the child's understanding of how knowledge develops requires and understanding of social and historical origins of knowledge and of changes in that knowledge. In this matter, Acharya (2015), also argue that the human knowledge originates in socially meaningful activity and is shaped by language. Banks & Banks (1995); as cited in Acharya, (2072) suggest that, Teaching mathematics requires addressing diversity because it is needed for the people of different cultures. Multicultural education is a field of study designed to increase education equity for all students. Moreover, the pedagogy which the teachers use to teach multicultural students should be made students culture friendly. Through acculturation students will have the chance to socialize and maintain peace and harmony in the country (Acharya, 2072).

In the context of Nepalese schools, there is a vast gap between their practice and the theory of culturally responsive teaching in the school. To maintain this gap teachers need to play important role for maintaining delicate balance between cultural entity and contents so that there is equity, equality as well as excellence in content knowledge (ibid). Khanal (2015) also found that secondary school mathematics teachers in Nepalese school used traditional teacher-centered

approach for teaching mathematics without encouraging students to participate in the classroom activities. Teachers' teaching strategies have a significant role in promoting learning strategies. Classroom practices play significant role in promoting students' learning strategies.

Children can be successful in mathematics when their understanding of it is linked to meaningful cultural referents, and when the instruction assumes that all students are capable of mastering the subject matter. The role of pedagogy is to help learners by moving from a traditional role of teacher as knowledge give and students as knowledge receiver to a complex teaching learning system (Ladson-Bilings, 1995; as cited in Acharya, 2072).

### **Difficulties to Class Control in Collaborative Classroom**

Collaborative classrooms tend to be noisier than traditional classrooms. This is a legitimate issue for a number of people. Some teachers believe that noisy classrooms indicate lack of discipline or teacher control. In such situations, they argue, students cannot learn. Earlier in this essay we stressed that collaborative classrooms do not lack structure. Indeed, structure becomes critical. Students need opportunities to move about, talk, ask questions, and so on. Thus, we argue that the noise in a smoothly running collaborative classroom indicates that active learning is going on. However, students must be taught the parameters within which they make their choices. Rules and standards must be stressed from the beginning, probably before any collaboration is initiated, and reviewed throughout a school year.

The teacher's ability and skill for classroom management has great importance in collaborative classroom. Problem in language gender, culture, sitting adjustment perception racial discrimination, class struggle among students are some of the issues that should be taken under consideration inside a collaborative classroom. If the language that is spoken in mathematical class is ambiguous and different than the language of the students. In such a class the cross communication and the values are very essential. Therefore it is essential to design the classroom pedagogy to address the problems of the students.

In a question regarding the obstacles on teaching mathematics in collaborative classroom, Teacher is replied,

*"While teaching, we face problem to make them understand properly the particular topic due to their mother tongue".*

In the given response the teacher clearly states that the linguistic background of the teacher and student has also becomes a hindrance in effective teaching. The teacher further said, "Teacher

has to take 6 to 7 periods everyday which make them tired that it creates challenges to give individual support and individual guidance to the students.

Similarly, the teacher B remarked “*The teachers from different cultural background have difference in thinking style*”. From his given response we can have the idea that there is difference in thinking style according to their cultural background. The teacher further remarked, “*Students are habitual in their own mother tongue that makes them difficult to understand the subject matter.*”

Similar to the teacher A, the remarks of the teacher B also suggests that the mother tongue of the students is notable issue that hinders the learning process.

Collaborative classroom tend to be noisier than traditional classroom .this is legitimate issue for a number of people. Some teachers believe that noisy classrooms indicates lack of discipline or teacher control .In such situations, they argues students cannot learn .Earlier in this essay we stressed that collaborative classrooms do not lack structure, Indeed ,structure becomes critical students need opportunities to move about talk ,ask question , and so on. Thus, we argue that the noise in a smoothly running collaborative classroom indicates that active learning is going on. However students must be taught the parameters within which they make their choice .Rules and standards must be stresses from the beginning, probably before any collaboration is initiated and reviewed through a school year.

The spirit of America is innovation .In almost every area of life we crave the new and better yet teaching stands out as one of the few fields innovationimprovement are neglected.(Eurich 1964,p.49).An analysis of common obstacles and barriers to collaborative classroom change ,it is hoped ,will better enable readers to understand and act upon for change proposed in the collaborative classroom."To understand the adoption and transformation of innovative ideas in the classroom, one must also understand the phenomenology of the teachers" .Difficulty in class control in collaborative classroom see few incentives to change for several common reasons. First and foremost is the pervasive belief that how is the lack of incentive to change class control?

Students "A" said,

*"They are all good teachers but when one's self perception includes the image of being an above average teacher little reason exists to try new approaches and visible rewards for innovative teaching institutions have classroom instruction."*

In the same question, students "B" said,

*"Teacher's are no responsibilities for teaching in the classroom. Teacher will never be able to cover the material because the use of collaborative learning reduces the amount of time available. Lecturing is an easier and more efficient means of transmitting information."*

It was found the lack of incentive to change in learning collaborative classroom and these finding suggest that to serve best the expressed preferences of students need not feel compelled to spend all or most of the time in class covering information that was previously covered in assigned readings collaborative classroom.

The lack of incentives to change in collaborative classroom .Teachers despite the large number of reports. Personal costs of trying new innovation are often high and innovation are acts of faith, requiring that one believe that they will ultimately bear be worth the personal investment. Teacher attempt alternatives to traditional approaches are relatively few.

What are the barriers in class control?

Teacher's view "A" said,

*" I can't cover as much content in the time available. I promote collaborative classroom take too much preparation before class. I cannot apply in materials or equipment need to support lack of the time in collaborative classroom."*

In the same question asked teacher's "B"

*"The lack of materials or equipment needed to support active learning can be a barrier to the some strategies promoting collaborative classroom but certainly not all . For example, asking students to summarize, writing the materials they have need or forming pairs to evaluate requires no equipment. Students are lacking of discipline. Students believe noisy classroom indicate lack of discipline of people, Students need opportunities to more about, talk ask question, and so on. We argue that the noise in a smoothly running collaborative classroom."*

In the same question, Students "A" The student asked, "sir, could you explain the last step?" to which the instructor replied, "If you're going to interrupt me with question, we'll never be able to cover the material. Collaborative classroom tend to be notices than traditional classroom. This is a legitimate issue for a number of students. We stressed that collaborative classroom do not lack structure. Students meant be taught the parameters within which they make choice."

In the regard, the difficulty is that students will not participate actively, learn sufficient content use order thinking skills. For instance, along with instructor's decision to use

collaborative learning in the classroom. To understand the adoption the view of themselves as reformers within of influence, the classes they teach every day (Cross 1989. P.1) Teachers can begin to reform through the use of strategies promoting collaborative leaning in the classroom. Further new skill can make old skills obsolete, and both concerns are powerful influences of attitude and behaviors. And many instructors fear that the use of collaborative classroom requires the immediate and total revision of all class notes advice notes for every class they teach. While students, parents, generally do not take kindly to the use of large classes, the temptation to allow class sizes to increase has mounted with budgetary pressure (Weimer 1987). While large classes might preclude the use of some strategies promoting collaborative learning in the classroom they certainly do not prevent the use of all possibilities.

I conclude that, I have found when teacher and schools more from traditional to collaborative instruction several important issues are likely to arise. They are important concerns for teachers, administrators and parents. Vygotsky (1978) a developmental theorist has influenced some of the current research of collaboration among students and teachers and on the role of cultural learning and schooling. His principal premise is that human beings are product not only, but also of their human cultures, intellectual functioning is the product of our society and language is the sky mode by which we learn our cultures and through which we organize our verbal thinking and regulate our action. Children learn such higher functioning from interacting with the adults and others children around them. Scaffolding and development effective care gives engage in regulating dialogue with children almost naturally. A key phenomenon of such interaction is that care gives maintain the dialogue just above the level where children can perform activities independently. Jerme Bruner and his called level range in which a child can perform a task with help. The zone of proximal development, scaffolding and dialogue are especially useful concept of frameworks for school learning. Vygotsky observed that effective teachers plan and carry out learning activities within children zones of proximal development, through dialogue and scaffoldings, Floxio- Rione drew five maxima from studies of care gives child interactions that illustrate these points and should characterize school instruction.

- ) Assume the child (learner) is completed
- ) Know the child (learner)
- ) Share an interest in the task at hand with the child (learner)
- ) Follow the children's (learner's) lead



) Capitalize or uncertainty.

Very few teachers have the luxury of teaching children on a one to – one basis. Fortunately, we know that tutoring is not in fact, the only or even the best way for students to learn in most situations. Dialogue, scaffolding and working one's zone of proximal development can be accomplished in collaborative classroom, and are being accomplished in many classrooms.

### **Difficulties to Address Individual Differences in Collaborative Classroom**

This concern is a difficult one to solve unless major changes in other areas of schooling are also undertaken. Students are used to being graded for individual work; parents expect to know how their students fare in school. School staff and state departments depend on traditional assessments. In collaborative classrooms, it is often difficult to assign individual grades. Some teachers give group grades, but many students and parents are uncomfortable with these. There are a variety of individual differences that must be of concern to classroom teachers. Some of the most prominent are academic ability achievement level, gender, learning style and ethnicity and culture. There are three different approaches for dealing with individual differences among students. An individual difference is to develop or modify the events of instruction so that they specifically address individual differences. On the whole research tends to support within class ability grouping as beneficial to the leaning of most student. It seems to be more flexible and consequently, less stigmatizing. However this is a based on a small sample of classes and therefore need considerable. The ability grouped active learning discussed by Slabin (1994, p.319) is an example of a effective method.

Teacher's view "A" said

*"Students ability are not great enough to warrant differences in curriculum, except in circumstance such as major leaning disability or extra ordinary talent."*

In the same question teachers "B" said

*"Students entering knowledge are great enough to warrant differences in what is offered to students at a particular grade level."*

In the same question teacher "C" said, *"In Students to work enough to overcome difference in entering knowledge and should be taken into consideration in any placement of students."*

In the same question student "A" said,

*" In collaborative classroom the teacher as a facilitator who facilitating involves creating rich environments and activities for linking new information to prior knowledge, providing*

*opportunities for collaborative work and problem solving and offering students a multiplicity of authentic learning task."*

In the same question student "B" said,

*"In collaborative classroom the students especially important is good setting, a critical process that helps to guide many other before during and after learning activities."*

In the same question Teacher "C" said,

"Cooperative learning is an instructional strategy in which students are placed in heterogeneous groups. This method is one of the best researched educational innovations of the last two decades."

In the same question Teacher "D" said,

*"I use in mastery learning. Students are structured so that develops mastery of prerequisite skills before they begin a new lesson. Mastery learning has not demonstrated any superiority over traditional instruction when it is implemented on an individual classroom. It has been shown to dramatically improve student's achievement when it is successfully implemented on a school or district – wide basis."*

I concluded that: I have found that Mastery learning has not demonstrated and superiority. While individualized instruction is logically the best way to deal with individual difference. In my opinion Cooperative learning is one of the best researched educational innovations. I conclude that; I have found in individual difference were in ability, entering knowledge, interest, learning style, willingness to work and cultural background, teachers was difficult individual difference in collaborative classroom.

In response to the first issue, many collaborative teachers have expressed surprise when seemingly less-able students had insights and ideas that went way beyond what teachers expected. Further, if each student contributes something, the pool of collective knowledge will indeed be rich. In answer to the second concern, data suggest that high-achieving students gain much from their exposure to diverse experiences and also from peer tutoring (Johnson and Johnson, 1989). Also, students who may be high achieving in one area may need help in other areas. Teachers and others also wonder whether shy students can fully participate in a classroom that depends so much on dialogue. We suggest that these students might feel more comfortable talking in small groups that share responsibility for learning. Furthermore, interaction between learners can happen in ways other than oral dialogue, for example, writing and art. A related

concern is that many schools are structured homogeneously so that an individual teacher cannot form heterogeneous groups without involving changes in the entire school. A whole class of "low" readers is taught by one teacher, "average" by another. High school tracks are even more systematically entrenched. Clearly, these practices are not conducive to collaborative learning and require system-wide restructuring. Individual teachers or groups of teachers can initiate dialogue on the problem, however.

In this regards, In the UCSMP materials (1993), we assume teachers are equal in ability, by we know teachers differ in entering knowledge we cannot do much about your willingness to work except to provide you with materials that is interesting enough so that you will want to see. Individual differences in social family and cultural background, even though great and diverse are not enough to warrant differences in curriculum. But instruction needs to take into account this difference. The contribution of various cultures is important in idea. Every mathematics courses should allow for individual differences in interest by including a wide variety of activities and contexts while brings out the brilliance surprise, applicability. And structure of mathematics. Difference in interest in mathematics should be handled in classrooms via projects and other activities in which students are given choice and for those with great interest outside the classroom via mathematics clucks and for some, mathematics contests.

### **Gender Diversity in Collaborative Classroom**

A classroom is a place where there is the presentation of diverge culture, class language religious group, community. Culture, environment and different intellectual background people who make a miniature society. Gender equality in education includes his equal opportunity and equal availability of education. None of the students should be excluded from the educational opportunity in case of to their caste, gender or economic class. Every boys or girls should have knowledge of mathematics to cope with the problems in the future. Equality in education has become the most interesting and important topic in the present world. Though there are no final conclusions, remedial methods are use to minimize the gender problems inside a culturally diverse classroom. (Pandit 2067. p. 29)

Gender diversity is inevitable diversity inside mathematics classrooms. Almost every classroom is compiled of students from diverse gender. The students\teacher were asked about the performance of the students from different gender and here I have presented the few samples of those answers. The teachers were asked question what is the role of teacher to manage gender-

friendly classroom? And students were asked 'what do you think about the performance according to gender inside a collaborative classroom? The answers had variation with the similarities in the core problem and concept. Students, who was a girl gender said, 'there are many boys inside our class and we feel shy to share question because they laugh without reason. "Students' remarks. In this answer the problem of girl students from all over the country is presented. Girls feel too much has relation the frank performance inside a classroom. Students remarked,

*"When the teacher asks the question the boys are fatter on reply."*

Remark of these boys' shows that first students are shadowed inside a classroom.

Teacher "A" remarked, *"Most of the girls have poor performance because they do have many talks in their rounded before and after the school."*

Thought this case did not refer to the teachers failures, he is clear that the task provided to the girl child ensued her house are in fact a burden to the girl student. Teacher "B" remarked.

*"The discipline of girl student is praiseworthy but they are weak in mathematic become they get less time to practice".*

This reply also seemed similar to the prefer teacher because both of them have similar understanding regarding their free time at home. Teacher "C" remarked,

*"The introvert natures of girl student sometimes create difficulty to interact".*

This statement is the result of our social structure that prior things male are female females are always taken as weak and shy characters in the society who cannot lead male. As sardonic explains that every individual and social group are significant indicants of status and class portions and human culture cannot be understand as an is dated and self contained object of study must be example as part of large social and cultural structure.

In addition to collaboration, teachers need to model, have conversations, and give chances to practice critical thinking, another 21st century skill, that includes knowing how to persevere while problem solving. Their lives clearly poems to the background and the social-culture status of the students in the teaching-learning process as everything is guided by economic and culture reality. The gender diversity of students is not celebrated rather condemned as in sufficient. Talking about gender aspects, the patriarchal society like ours always prorating the son instead if daughter except in some high-class families and it affects in learning (Upadhya, 2070.p.137) Gender diversity is one of the most prominent aspects of

multicultural classroom as Bed Raj Acharya writes. Beside all these learning theories the teaching learning process is affected by gender inequality, cultural discontinuity, power in classroom etc. Gender difference in mathematics still exists in learning of complex mathematics; personal belief in mathematics and choice that involve in mathematics gender difference in mathematics may be decreased by improving socio-economic status and ethnicity, politics of schools and teachers attitude. (2015.p.44)

Summing up, the problem in taking gender diversity as problems is a long rooted problem in over educational sector too. This can only be removed by cultural responsive type of thought and social critical theory. In this regard strait matter states, "male students getting more academic help from their teacher, gender inequalities are motivated by an differ in mental intellectual ability".

## **Section II: Teaching Learning Best Practices In Collaborative Classroom**

In this section I deal the teaching learning practices in collaborative classroom. For this I observed classroom teaching and learning situation and take the interview of teacher and students.

### **Contribution Collaborative Learning Classroom**

A small group of students could be culturally and socially very diverse and thus, collaborative learning projects could open up the world to learners as they begin to gain a new perspective on life from their peers. Students also get to reflect upon their lives and values against those of their classmates and learn to acknowledge differences without being critical. Nepal is small landlocked country located in the south Asia. The country has a total population 26.6 , million that consists of 92 different language groups, 125 caste 59 ethnic groups and 10 religious group (central Bereau of statistics. According to the CBS, 2011) the literacy among Nepalese over six years of age has increased from 54.1%, in 2001 to 65.9% in the 2011 census Mae literacy is 75.2% compared to female literacy at 57.4%. Leikin and Zaslansley (1999) propose four necessary conditions that together constitute a cooperative leaning setting.

- ) Students learning in small groups with two to six members on a group
- ) The earning tasks in which students are engaged require that the student mutually and positively depends on one another and on the groups work as a whole.

- J Learning environment offers all members of the group an equal opportunity of interact with one another regarding the tasks and encourages them to communicate their ideas in various ways, for example, verbally.
- J Each member of the groups has a responsibility to contribute to the group work and is accountable for the learning progress of the group.

To be cooperative a learning setting should ensure the existence of all these conditions. Cooperative learning can be used with any class and just about objective can be taught through a cooperative groups activity in co-operative learning which the group may be working together, each individual within group is still accountable for learning the materials. Heterogeneous teams almost always characterize cooperative learning and the group are usually very carefully planned to include all level of learners (Andersen, 2009).

Teacher's "A" said,

*"Students learn both passively and actively. Passive learning takes place when students take on the role of receptacles of knowledge i.e. they do not directly participate in the learning process .Collaborative learning is more likely to take place when students are doing something besides listening."*

In the same question, teacher "B" said,

*"Students are involved in more than listening. Students are in higher order thinking .students is engaged in activities. Students are exploration of their own attitudes and values."*

I was found that, to provider a working the analysis, purpose the involves students in doing things and thinking about the things they are doing.

In the same question, teacher "C" said,

*"Students learn what they care about and remember what they understand. When students learn by becoming involved? Students involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience".*

In the same question, teacher "D" said,

*"Active student involvement is a more powerful learning tool than passive attendance. The group can represent a more valuable process for learning than student acting alone. Student generated discussion is used to promote the arising of differences and group projects are assigned to provide opportunities for students to develop teamwork skills."*

I found that the strategies promoting and motivation collaborative learning. It is even more helpful to envision a continuum of possible classroom actions that increase in student's activity. The passive end of continuum would include such things in class. Students are involved is more than listening. Less emphasis is placed on transmitting information and more on developing student's skills. The focus was on studies conducted within collaborative learning in the classroom.

So, from above mentioned study, I concluded that mathematics communications can pay an important role in learning mathematics. Exchange of knowledge one another is the basis of cooperative learning in mathematics collaborative learning strategies is the effective culturally responsive pedagogy mathematics. When communicating mathematically, students enhance their understanding of mathematics, establish shared understanding of mathematics become more active learners. Teaching is most effective when the teacher and learner have a healthy relationship.

### **Positive Interdependence in Collaborative Classroom**

In a traditional classroom group setting, students are not interdependent upon one another. There is no feeling of a positive interaction where the students need to work as a group to produce a quality piece of work. On the other hand, true collaborative learning provides students with incentives to work as a team to succeed together. Positive interdependence is promoted by creating specific roles for students providing a one set of manipulative or materials of face students to work together and creating the goal of one point task, when a student's perceives their responsibility to themselves, individual mathematical activities are compromised and developed. (sheehy, 2004, p. 178)

We can share our view without any hesitation. And we would like to start from each group. I did hope may be everybody you have interested with each other and shared your idea to your friend. So again request to all of you, please whatever you confer in your group those the end contribute to other group according what you have got research in positive interdependence.

I found that, teacher and students always have fixed previous determined knowledge out any prior knowledge in teaching of mathematics, students also learn the same way of teaching. In teaching algebra, we just give formal of any algebraic expression without describing its practical implication. While teaching algebra teachers wrote formula only. They did not try to teach mathematics in an innovative way, Moreover the stories math the technical interest. Therefore

the above strong means that students were controlling the environment in my class. They were not free from other environment. So they were contorted by teachers, whatever teachers deliver to students that were fixed to the students for learning.

Teacher "A" said,

*"In a collaborative setting, the success of one person is dependent on the success of the group. This is referred to as positive interdependence. All members should rely on one another to achieve the goal and need to believe that they are linked together to succeed. Positive interdependence as the belief of anyone in the group that there is a value in working together and that the results of both individual learning and working products would be better when they are done in collaboration."*

In the same question Teachers "B" said

*"I use research findings on the positive inter dependence academic unpreparedness, group dynamics, and poor listening skills. In a collaborative setting it refers to group members relying on one another in order to succeed."*

In the above line, I concluded that teacher's motivation positive interdependence. positive interdependence is the heart of collaborative tasks. According to collaborative learning setting is the belief that the group setting is the belief that the group members upgrade or downgrade together. All members are united around a common goal. Similarly, I took interview with students "A". I discussed same question maintained above with her. After, my questions she answered.

*"We can call group. All are collaborative only positive interdependence is among member the belief of sinking or swimming together while they are committed to reach a common goal. The success of a member is bound to the success of the group. Positive goal, reward, resource, role, identity, environmental, task are interdependence."*

In this line, I declared that teacher" A" mutual reward is given for successful group work and members efforts to achieve Maslow's (1943).

Maslow's Hierarchy of needs (psychological and safety need) of PL. Maslow consequently extended the idea to include of human's innate curiosity.

In the same question Teachers "C" said,

*"I am the organizing of the group works in a sequential pattern. When the action of one group member have to be accomplish, Positive outside enemy interdependence is by putting groups in*



*competition with each other feel interdependence intended to promote the most effective teaching possible for the greatest number of students."*

In the above line, I concluded that teachers they strive for the success of group .They benefit from a subject is celebrated. Rewards are viewed to be endless. The group performance is evaluated by comparing to the specified criteria. Positive interdependence is the heart of collaborative activities that define collaborative and transform group work into teamwork."According to transformative learning (Mezriow, 1991) is the process of effective change in a form of reference. More ever transformative learning information learning information as and in which these participants have full information.

Similarly, I took interview with teacher "D". After my question he answered.

*"The critical role of dialogue in collaborative classrooms has been stressed throughout these modules. The collaborative classroom is alive with two-way Communication. A major mode of communication is dialogue, which in a collaborative classroom is thinking made public a major goal for teachers in to maintain this dialogue among student."."*

Teacher "E" said,

*"I use research findings on the positive interdependence academic unpreparedness, group dynamics, and poor listening skills. In a collaborative setting it refers to group members relying on one another in order to succeed."*

In the above line, I conclude that. Each individual has only a part of the information, resources, materials needed for his or her task. Positive interdependence is met when particular roles are assigned to group members.

These roles can be rotary to give all team members the opportunity to experience. Social critical learning Theory (1987) discusses about gender insures, discontinuity, power of teacher in classroom. It studies how these factors affecting teaching learning process.

In this regard, Acharya (2015) writers it is believed that mathematics is a difficult subject. The major cause of such widespread image of mathematics is due to the traditional methods of pedagogy and disempowerment of students on how mathematics is learnt. There of students on how mathematics is learnt. There are several disserve powering forces which have been contributing to make the mathematics a difficult subject. In this context, how can the students be empowered to learn mathematics meaningful is a paramount concern in academic and elsewhere? The students need to be motivation on serve aspects. Facilitate student involvement

in class discussions and interactions. Monitor student's participation in class activities. Be sure all students in the classroom have equal opportunities of participate in classroom.

The above ideas demonstrate that the collaborative learning can be developed in students through employing multiple ways of problems solving approaches and interpretation of the collaborative classroom. Listen carefully to students questions and answer and ask for clarification when the question and responses are not clear or relevant. He creates conducive discussion environment among the learners. The teacher has to play the role of facilitators for engaging study in meaningful discussion of mathematics idea. Further, the teacher needs to encourage all the learners for active participation in discussion in an enthusiastic environment. Students in a Quentin concerning positive indolence to learn mathematics in collaborative classroom student A said, the mathematics teacher encourages students solve the problems on their own". This response shows that the mathematics teacher is cautions about the real condition of the students so that he wants them to be actively participating in the problem solving process.

### **Accountability in Collaborative Classroom**

The term “collaborative learning” refers to an instruction method in which learners work together in small groups to achieve a common goal. Individual accountability as a structural element in collaboration is pivotal to prevent and lower the likelihood of free riders or social loafing. Individual accountability is the belief that everyone will be accountable for her/his performance and learning. Individual accountability occurs when the performance of each individual is assessed and the results are given back to the group and the individual in order to identify those need more assistance and support in learning. This article reviews the importance of individual accountability in collaborative learning. Johnson and Johnson stated that teachers must assess the contribution of individual members to the group's work in order to ensure that each individual is accountable for doing their job in the group's work (Sheehy, 2004). Sheehy noticed that the assessment of individual accountability indicates that mathematical activity supporting the group is valued more than activity enhancing individual learning.

I got to know about them after I joined the creative academy, my interest in mathematics subject in the traditional teaching learning activities. Those teachers who taught us mathematics. Only the lecture method and writing on the bound is not sufficient to build up the conceptual framework on pupils mind visualized. But my teachers always taught us by using lecture note, when they were to teach mathematics in class the following day they prepared a lecture note

back at home and copied the same on the board in the class. Not only math but other subjects also were taught in the same teacher. Not new approach but a lecture method. Therefore, I got teaching learning activities in school. I started to ask a question myself, " why do the teachers in Nepal use the same approach the lecture method while teaching in class? Sometimes, I felt discouraged with my study because I had to memorize each and every answer, formula line by line. Otherwise I didn't have any other option to promote for my study.

I found that. Moreover, it is not compulsory for the teachers to complete course. Therefore you need to work on your own. Teacher also may care for the students teaching learning activities.

Teacher's view "A" said

*"I work together in small group to achieve a common goal. Individual accountability as a structural element in collaborative is pivotal. Individual accountability occurs when the performance of each individual is assessed and the results are given back to the group and the individual in order to identify more assistance and support in learning."*

By this reality, I found that individual accountability occurs when the performance of each individual is assessed and the results are given back to the group. The individual in order to identify those need more assistance and support in classroom. The learners are accountable for one to another's. The success of one learner helps other members to one learner helps other members to be successful. The purpose of the learning in groups to make each member stronger as an individual.

In the same questions in the teacher "B" said,

*"Team members hold each other responsible for their share of the work. Which is learner work together in small groups to achieve a common goal? Individual accountability as a structural element in collaborative is pivotal to prevent and lower the likelihood of free riders or social loafing. The results are given back to the group. The individual in order to identify those need more assistance and support in learning."*

Teacher's "C" said,

*"I am responsible accountable, education and learning have been essentially reformed. The dominant change is a shift from a tradition teacher directed paradigm of training to a unique and novel student centered one. Learning in collaboration and group is an attempt to make each member a stronger individual in his or her right. Members learn together so that they*

*subsequently can gain greater so that they subsequently can gain greater individual competency. Team member shows that each other responsible for their share of the learning."*

This answers shows that, Individual accountability is the belief that each member in group is responsible for his/her performance as well as the work of their teamwork. In this regard, (Klemm, 1994) is not taking learners each other, either face to face while they do their individual assignments. Let is not asking students do the task individual and then asking those who finish first help those have not yet finished. And it is certainly not having one or a few students do all the work, which the others just add their names to the report. Individual accountability exists when the performance of each individual is assessed and the results are given back to the individual and the group in order to identify who needs more assistance, and encouragement in learning. Free riding and social loafing occurs when it is difficult to identify member contributions, or members participations are in excess. Members are accountable for the end result of the group. (Hakins, and Petty, 1982;)

In the same questions

Student views "A"

*"I the individual's own mental processing. Lecturing by itself will never lead to real learning. I am helping those who have yet finished. The purpose of the learning in groups is to make each member stronger as an individual. They are all group members take responsibility for their share of work. They teach each other the subject rather than just telling each other the answers. The importance of the role of Individual accountability in terms is verified by work on group development, self-managed work teams and goal setting."*

In this question, "A"(students) answered that

*"I feel not pressured to an idea, completion of a task to their group activity. Individual accountability indicates that mathematical activity supporting the group."*

In the same question in students "B"

*"I am also based on the idea of equal participation. Individual learning contributes equally for team success. I can be assigned a discrete task and all the discrete components. I can identify at a glance which team members have contributed. I can be used to heighten individual accountability."*

Students" C" *"I work together in small groups to achieve a common goal. I am belief that everyone will be accountable for her performance. I occur when the performance of each individual is assessed and support in learning."*

I found that; Individual accountability as a structural element in collaboration. Individual accountability is the belief that everyone performance of each assessed. Individual accountability is three pillars of cooperative learning. Each individual in a term must be able to show mastery of the assigned learning and should be able to document. In true cooperative learning, every individual contributes equally for team's success.

### **Students Encouragement and Motivation in Collaborative Classroom**

By collaborative learning students could make an interaction between them and make the material more enjoyable. It was more understandable. The activities in collaborative learning give a big role in their learning. It made the learning more interesting. They could participate in all activities actively. Collaborative learning makes students creative in finding a solution for the problem they have. The condition of the class is more dynamic and the function of the students as the subject of the teaching and learning process can be done well. Collaborative learning also makes a passive student to become more active and give them the chance to be communicative with the material and their friends. By using a collaborative learning the students can share their understanding and knowledge with their friend, so that the difficulty in handling a material can be solved.

The students also feel more motivated in learning Mathematics using a collaborative learning rather than learn a material individually. "Motivation directs controls and clarifies the human behavior. Some student seems naturally enthusiastic about learning but much need or except their teachers to inspire, challenge and stimulate them". (Acharya 2013,p.31) In the concept of John Holt theory of fear, children's have fear of being punished and disgraced from the teacher. They get afraid of the probable failure in their study and they have innate self correcting mechanism that helps them to solve the problem correctly.

Encouraging the students is one of the effective processes to make their standard better and to encourage for father learning with enough exposure. Children need to be encouraged to recognizing and acknowledge their feelings, both negative and positive. Both negative and positive reinforcement can speed up and positive reinforcement can speed up and better their further performance. Effective school research focuses on the constructive guidelines to the

students in the classroom for improvement that helps students learning as well as developing positive attitude and belief motivation is also one part of reinforcement. It helps to develop positive attitudes and belief. Motivation is also one part of enforcement. It equally harms of that is negative reinforcement. (Upretee, 2006 p. 39)

In the same question teacher "A" replied

*"Students are encouraged to help and share in their problem. They are encouraged to ask their problem and discuss among them."*

In the same question for teacher "B" said,

*"I divide the students in group of the basis of their mother tongue and emphasis on students who are not able to understand language properly. We encourage students by praising their works reward should be given and teaching in group in another way for reinforcement."*

When it was first shown that the capability of children with equal levels of mental development to learn with a teacher's guidance varied to a high degree it became apparent that those children were not mentally the same age and that the subsequent course of their learning would obviously be different."

He viewed that the current or accrual level of development of the learner and the next level attainable through the use of mediating semiotic and environmental tools and capable adult as per facilitation.

In this regard students and teachers from the sample schools expressed mixed responses.

Teacher "A" replied.

*"Students are encouraged to help and share their problems. They are encouraged to ask their problem and discuss among them."* In the above statement teacher A believes that the peer group discussion and the cooperation between students can make them understand better and enhances effective classroom practice. The teacher let students discuss and ask for difficulties among themselves A students remarked.

*"Mathematics itself is not a boring subject. Interest of students and teaching way of teachers make it ready realizing and productive in my classroom. "*

The remark of the students of finds mathematics as an interesting subject which inspires him to learn. His remark also suggests that the method of teacher is who suggest that the method of teacher is who reinforcement for the learning mathematics in culturally diverse classroom.

Teacher B has a different technique to deal with the students of collaborative classroom. He said,

*"I divide the students in group of the basis of their mother tongue tad emphasis on students who are not able to understand language properly." Secondly has informed, I always be home equally to all students so they went to read and they take teacher positively.*

Teacher "C" said,

*"We encourage student by paining their works reward should be given, and teaching in group in another way for reinforcement."*

Here teacher C takes reward and praising as the tool for motivation.

In this regard the group discussion and cooperation among students is a way for collaborative learning which have grader significance on modern education. Regarding collaborative technique Kevin Crouse has said. "Collaborative learning is more than group work in an English or history class. It is difficult philosophy with real usefulness in mathematics classes".(Maharjan, 2068 p. 136)

### **Student Centered Pedagogy in Collaborative Classroom**

Student centered pedagogy always advantages interactive and co-operative learning where students has a prominent role for whole teaching and learning activities. Learner centered instruction provides time for students to reflect and this gain a deep understanding (ERIC,2002).In this context explained her understanding about student centered pedagogy in this way;

Teachers "A" said

*"When I started my teaching as a school teacher, I have no any clear ideas about students centered pedagogy. So ,I used to follow I am aware about student centered pedagogy. I emphasis students centered methods for effective and meaningful teaching learning activities."*

In the same question in "B" said,

*"Student centered pedagogy focus on learns activities .Addressing different types of learners, I make plan for instruction. I only play my role as a facilitator rather than a tutor. I encourage my learner for interacting with their peers and with teacher as well. I also provide special opportunities for learners who need extra support for improving their knowledge and skill .But the large numbers of students with different background makes uneasy to implement students centered pedagogy.*

In this context, I noted that teacher "A" perception included pedagogy .I found that, learners were actively participating. I found that her confidence and student oriented class

activities to be impressive. The learners get opportunities to do work and behave according to their need and interest; they create what they know. It also motivates a learner.

In the same question Teacher "B" said:

*"If learners get collaborative and supporting environment within the class, they feel safe and secure. In this situation, students learn and they can develop their inner capacity well. In students centered environment. For this, I encourage learners to also try to make them interactive about the mathematics contents to be taught."*

Perceptions teachers "B" were also similar to that of others but he was teaching his students without any special strategies. When I observed his classroom, I saw that there ever know any special activities with the student centered pedagogy. When I found, he was teaching his learners using text book and lecture method's well.

Students view "A" said

*"I do not understand instructional method. There are no kinds of pedagogies and techniques in our teacher. My classroom practice is not being developed according to the demand of student centered pedagogy. Our teaching lacked learner centered pedagogy in classroom."*

As I analyzed, the pedagogy which the teachers use to teach students centered pedagogy. They lacked practice in applying their pedagogy in actual mathematics classroom to address the realities of the students centered pedagogy in collaborative classroom.

In the same question Teacher "C" said

*"Student centered pedagogy models have gained only popularity. In this method use in classroom many challenges faced. These models have not common, difficulty in class control, identify the individual differences."*

In this regards, Vygotsky's (1978); as cited in Acharya, (2015) known for his theory of social constructivism, beliefs that learning and development are collaborative activities and that children are cognitively developed in the context of socialization and education. There is perception, attention, and memory capacities of children are transformed by vital cognitive tools provided by social context. Furthermore, Vygotsky (1978) emphasized zone of proximal development between the actual developments of child as determined by the independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more move guidance or in collaboration with more peers constructivist learning theory consists of the major principle that during the process of



learning ,the learner has to be active as well as assembling knowledge Kowtrakool(2002) states that constructivist view.

In this regard (Acharya , 2015) Constructivist Learning Theory focuses on problem solving higher order thinking skills and keep learning theory seems essential while designing instruction of mathematics since it address focus and direction to the process and practice. This requires considering the learners needs and characteristics, content and context the strengths theory considering the scope of the instruction, preferences and expectations. The context or the environment in which the learning take place can be dynamic.

### **Classroom Observation Episodes**

Observation as a research tool has a long history in anthropology. It has been long used in ethnographic research basically in the study of primitive. Observation is the first step of the behavioral research and accusation of knowledge is generated though experience, leaning and practice. The experience is the first stage of knowledge an verifies the gaps and adders new things on knowledge observation in other words, enhance acquired knowledge through empirical test of facts, triangulation of data and participation with event, communities and persons. The communities and persons are the best and reliable source of knowledge by which everybody is socialized and educated. "It is fundamental basis of the all type of research". (Adles and Adler 1994 cited in dngrosino, : 2005)

The observation inside a mathematics classroom can stop students from diverting their mind towards unnecessary issues. A sincere observation can point the real lacking factors onside a classroom and it may a significant role in providing feedback to the students as well as teachers.

### **Episode -1**

I got chance to observe a mathematics class of grade IX in Shree saraswati secondary school Shivalaya,Jajarkot.This observation was held at shree Saraswoti Secondary school, Shivalay-6, Jajarkot. The mathematics teacher goes to classroom and then research also enters the classroom. Students of that class stood and greeted the teacher and the researcher also greets and permits them to have their seat. There were 35 students in the classroom. Desks and bench seemed sufficient according to the number of the students from various ethnic communities named Brahman, Chhetri, Tharu and Dalit students. The topics of that day were 'volume of cylinder and sphere. Firstly he explained the concept of sphere and cylinder. Then the solved the

questions from the book describing the students. When students finished copying the questions he solved another question which was different from the pronouns. The students were copying the solution on their exercise book. Two boys asked and out the solution the solution and the teachers replied. All students finished copying. He again gave one similar question for the class work. Some of the students couldn't be able to show the teachers. Three of them were ethnic students. At lest he guided from the white board and gave rest of the number of exercise as homework.

The teacher applied the practical aspects rather than the theoretical aspects that made students learn better. In class observation, the teacher used picture of sphere, cylinder, formula chart etc. Due to the clear projection of the teaching materials and the direct participation of students learning was fruitful. Only few of them had problem in understanding students seemed to feel relaxed inside the class. From the above mentioned interpretation of classroom observation, I found that the teaching method was student centered. Form the above class the teacher is found very sensitive and skillful in teaching process. He was practical and considerable about the linguistic problem inside the classroom. The students were actively participated in the classroom activities. The suggestion to the teacher is that he could give more examples because more examples can only make collaborative students clear.

### **Episode -2**

I observed a mathematical class of grade X in shree Saraswoti Secondary school, Shivalay-6, Jajarkot. During my observation I found that the teacher centered the classroom with the usual materials and the getting was done by the student. There were altogether 45 students inside the classroom. The teacher stated his class without my discussion on previous topic. He went ahead by writing the topic on the board and stranded with few background of the topic. I came to know that the topic for the day was home arithmetic. He was giving some examples related to topic of discussion like telephone bill, electricity meter and so on. He went ahead just by solving the question given in the book I found that only around half of the students were somehow active and able to comprehend. His teaching style and technique were only suitable for the students only for Dalit communities it was due to his style and the tone of speaking. It was learnt that the teacher was also from the near locality. The students who were from other communities have different in understanding the teacher. The teacher did not bring the problems related to their day to day life.

Teacher was found mint match in his delivery process. The teacher was unable to contextualize the mathematics problems because he could use the school electricity of water bills to solve the problems.

From the observation, I found the examples given in the classroom were not properly linked and explained considering all the student's level and capability. On the other hand, the focus was only given to the teacher centered methods. Teacher's style and the tone of speaking was also a problem for the students to understand the content in the classroom.

The teacher needs to improve his linguistic ability and tone. To make students clear he could have taken the examples from the school and their house activities. The teacher centered methods and lecture methods cannot meet the meet the need of the students from diverse background so that it should be addressed.

## CHAPTER V FINDINGS, CONCLUSIONS AND IMPLICATIONS

This chapter deals with the major findings of the research and conclusions and implication for further study. The first section reveals the major findings and next sections conclusions derived on the basis of research analysis and finally presents recommendation for further study.

### **Findings**

Finding related with the challenges in applying collaborative learning method:

- ) Mathematics Anxiety: we can say that more students are feel mathematics as difficult subject. Most of the students at school level are weak in mathematic. There are many reasons to be creating this situation. Traditional teaching learning methods is one the main causes for this. Most of the teachers use lecture method in teaching mathematics, which is not relevant for students. Students lean best when they are active rather than passive learners
  
- ) Traditional learning teaching activities in Collaborative Classroom: Still teachers have traditional belief on teaching learning activities. They feel easy to teach by using lecture methods, but it is injustice for students. The traditional methods cannot give equity in classroom. In the classroom occupy with diverse students need multicultural classroom teaching. For this, teacher needs to understand the different views of different students who are come from different cultural groups. If possible teacher needs to teach mathematics by connecting daily life of students.
  
- ) Gender diversity in Collaborative Classroom: Our social structure that prior things male are female females are always taken as weak and shy characters in the society who cannot lead male. As sardonic explains that every individual and social group are significant indicants of status and class portions and human culture cannot be understand as an is dated and self-contained object of study must be example as part of large social and cultural structure
  
- ) Individual difference among students in Collaborative Classroom: Mastery learning has not demonstrated and superiority. While individualized instruction is logically the best

way to deal with individual difference. In my opinion Cooperative learning is one of the best researched educational innovations. I conclude that; I have found in individual difference were in ability, entering knowledge, interest, learning style, willingness to work and cultural background, teachers was difficult individual difference in collaborative classroom.

Finding related with the best practice of collaborative learning method:

- ) Positive interdependence in collaborative classroom: Teachers they strive for the success of group .They benefit from a subject is celebrated. Rewards are viewed to be endless. The group performance is evaluated by comparing to the specified criteria. Positive interdependence is the heart of collaborative activities that define collaborative and transform group work into teamwork
- ) Individual accountability in collaborative classroom: Individual accountability occurs when the performance of each individual is assessed and the results are given back to the group. The individual in order to identify those need more assistance and support in classroom. The learners are accountable for one to another's .The success of one learner helps other members to one learner helps other members to be successful .the purpose of the learning in groups to make each member stronger as an individual.
- ) Student's encouragement in motivation collaborative classroom: Encouraging the students is one of the effective processes to make their standard better and to encourage for father learning with enough exposure. Children need to be encouraged to recognizing and acknowledge their feelings, both negative and positive. Both negative and positive reinforcement can speed up and positive reinforcement can speed up and better their further performance
- ) Student centered method in Collaborative Classroom: Analyzed, the pedagogy which the teachers use to teach students centered pedagogy .They lacked practice in applying their pedagogy in actual mathematics classroom to address the realities of the students centered pedagogy in collaborative classroom

## Conclusion

This study focuses on the problems encountered in using collaborative teaching method. The objectives of this study were to explore challenges in applying collaborative learning method in mathematics classroom and to explore the best practices of collaborating teaching method in mathematics classroom. In the conclusion, Collaborative teaching contributes to learn in mathematics. In this study I have found that positive interdependence in collaborative classroom, individual accountability, student's encouragement and motivation in Collaborative Classroom and students centered in collaborative classroom. Challenges faced by teachers and students were Mathematics Anxiety, Traditional learning teaching activities in Collaborative Classroom, Gender diversity in Collaborative Classroom, Individual difference among students Collaborative Classroom. The collaborative approach in teaching learning of mathematics among students and teachers is more suitable in Nepalese context for this; we should minimize the challenges of applying collaborative learning study.

Finally it is conclude that collaborative learning method is more effective than traditional method in teaching mathematics at secondary level. Collaborative learning method better motivates students to learn, helps students to understand and perform better in achievement test over traditional method in teaching learning mathematics. In sum up the study, I realized that collaborative learning helps learners to become constructively and actively involved in coursework topics, to feel responsible for the studying, and to improve the spirit of teamwork among the participants. Collaborative learning can provide real situational information and knowledge to the learners. Collaborative learning has its significant role for the students to understand the contents or subject matter or different issues/problems in learning process. For the meaningful result, proper practice of collaborative learning is required. Even though, there are challenges of practicing collaborative learning.

## Educational Implications

Every research has implications in different sectors. The study entitled "Problems Encountered in Using Collaborative Teaching Method" has educational implications, which are as below:

- ) It is concentrate to identify contribute in learning mathematics of collaborative classroom.

- ) The mathematics teacher should be encouraged to use collaborative learning method in teaching Mathematics.
- ) The teacher training institutes should focus their attention on collaborative learning method.
- ) Curriculum designer, textbook writer and subject experts should emphasize on collaborative learning method.
- ) It is helpful for every teacher to understand collaborative classroom, and to apply collaborative relevant teaching learning activities.
- ) It supports for contribution to learning mathematics, positive interdependence, individual accountability students and motivation in collaborative classroom.
- ) Explore the challenges in applying in applying collaborative learning method.
- ) It is helpful for teacher's students, researchers, institutions, educational and policy makers.
- ) For the development of collaborative mathematics classroom.
- ) Enhance equity and equality in mathematics classroom.

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## Appendix- I

### Interview Guidelines for Teachers

I am Mr. Dhan Bahadur Rawal, student of Tribhuvan University Department of mathematics Education as an area of specification, now I am carrying out research on "**Problems Encountered in Using Collaborative Teaching Method**" with special focus on one school of Jagarkot. I request you to cooperate by giving your response to the questions below. I assure you for the confidentiality and won't misuse the information other than research purpose. Your cooperation in this regard was appreciated an equally invaluable to complete this research.

- ) How does collaborative teaching contribute to learning mathematics in classroom?
  
- ) What are the challenges faced in collaborative learning method?
  
- ) In what extent the possibility is in applying collaborative teaching method in Nepalese school classroom?
  
- ) How can the students be encouraged to learn in collaborative classroom?
  
- ) What are problems do you face while teaching in collaborative classroom?
  
- ) What are the strategies those can be applied in teaching mathematics in collaborative classroom?
  
- ) What is the most useful technique that you have been applying in collaborative classroom? And why?
  
- ) What types of obstacles and difficulties have you felt while teaching through collaborative method?
  
- ) What is the role of teacher to manage gender friendly classroom?
  
- What are the techniques that you have been applying while teaching in collaborative classrooms?

**Appendix -II****Interview Guidelines for Students**

- ) Have you got any special techniques from your teachers?
- ) What do you think about the performance according to gender inside a collaborative classroom?
- ) How is your relationship with your mathematics teacher?
- ) How do your mathematics teachers evaluate your learning?
- ) Does teacher regularly take your class?
- ) Do you feel relaxed while being in collaborative mathematics classroom?
- ) How much time do you spend instating mathematics at our home?
- ) What sorts of punishment and rewards given by your mathematics teacher makes your learning better?
- ) What are the problems you face while studying with friends on collaborative classroom?

**Appendix - III**  
**Class Observation Form**

Name of Teacher:.....  
 Gender a) male: ..... b) female:.....  
 Teaching experience:.....  
 Types of Training.....Duration.....  
 School's Name and Location:.....  
 class:.....topic:.....  
 Period.....time:.....  
 Teacher spends time in classroom:.....  
 Total no. of students:.....Male students :.....female:.....

) Striking points of the lesson:

.....

) Mention the observed problems on leaning.

.....

) Suggestions to improve the teaching of the lesson.

Observation name.....

Date .....