

## **Chapter-I**

### **Introduction**

#### **Background of the Study**

Social justice in mathematics education refers to teach the students without all types of gender discrimination, economic discrimination, cultural discrimination, ethnic discrimination, and religious discrimination and so on. It provides a situation that all students have equal opportunity to read and learn in mathematics classroom. It is the important approach in mathematics education. According to Acharya (2017), Social Justice Pedagogy include i) equality, ii) equity, iii) fairness, iv) social process, v) inclusiveness etc. This shows that the main theme of social justice in mathematics education is to provide equity and equality in mathematics teaching. Social justice includes teaching students based on their individual ability, their language, culture, linking mathematics with students' daily life, teaching through playing game, encouraging students for learning and creating mathematics class more interesting as well as effective.

Social justice in mathematics education means providing equal learning opportunity to all the students. It believes on all students having equal right, access and opportunity for learning in classroom. According to this concept, the teachers need to treat all the students equally. According to Panthi, Luitel, and Belbase, (2018) Social justice includes providing equal access to curriculum, resources and good teachers. It makes students feeling that they are equally valued. Teachers need to make a commitment to transform educational fabric to develop, protect and grow potential of their students. For this, they need to create a fair, just, and inclusive educational setting inside the classroom.

Social justice is the way to attain the goal of social equality and equity. By the process of social justice socio-cultural diversity, individual ability, students multiple intelligences as well as other discriminations, inequality, domination etc. can be addressed. According to Bell and Adams (2007), Social Justice is both a goal and a process. The goal of social justice is develop equitable participation of people from all social identity groups in a society that is mutually shaped to meet their need. The process for attaining the goal of social justice should also be democratic and participatory, respecting the human diversity and group differences.

Every individual has born with specific ability. All students are not expert in all sectors. Family background, cultural factor, religious factor, geographical accepts, environmental, social factors etc. affect their behaviors and learning style. They show the same behavior in classroom what they learnt in their society and family. In this sense, the first schools of the students are their family and society. So, the mathematics teachers need to know that in which way the student can understand the mathematics? Which method is appropriate for teaching? All students have same ability? Same culture? So teaching the students by addressing these questions is called social justice in mathematics education.

According to National Council for Mathematics, “Excellence in mathematics education requires equity, high expectation and strong support for all students” (as cited in Panthi, Luitel and Belbase, NCTM, 2000, p. 10). So that supporting of all kinds of students and respecting their multiple abilities, groups, culture, language and so on is social justice in mathematics education.

Equity, equality, inclusiveness etc. are the major principle of social justice in mathematics classroom. Esmode and Caswell (2010), argue to enable significant within communities of learners, build on what students brings to school with them

knowledge and interests, cultural and linguistic resources and work with (not against) individual, families and communities are the three principles of social justice.

### **Statement of Problem**

The mathematics teachers need to teach the students by respecting their individual ability, interests, and cultural values and so on. The teachers have to teach the students without any discrimination on the basis of the principle of equity and equality. If the students can be taught in such kind of fresh and justifiable environment by the teachers then the expected objectives can meet easily and also the achievement of the students can increase which is helpful to the development of the individual, societies and the nation. In the context of Nepal, as being Nepal as a multicultural, multiethnic, multi religious country there is diversity between the students according to their culture, religion, ethics, economic background and individual ability, their creativity etc. So to teach the students by addressing this diversity is great challenge for mathematics teachers. It's very challenging to promote the social justice in the mathematics classroom or to teach in diverse ability students in a single classroom. Therefore, this entire research tried to find out the strategies used by the mathematics teachers to maintain social justice in mathematics classroom and solved the research problem by addressing the following research questions.

- ) How does the teacher use strategies to promote social justice in mathematics classroom?
- ) Why does the teacher face challenges in maintaining social justice in mathematics classroom?

### **Objectives of the Study**

The main objectives of the present study were:

- ) To explore the strategies used by the mathematics teachers to promote the social justice in mathematics classroom.
- ) To explore the challenges face by mathematics teachers in maintaining social justice in mathematics classroom.

### **Significance of the Study**

Mathematics is the important part of our daily life. Mathematics has been taught as a compulsory and optional subject in school level. Teaching mathematics is very challenging because of our social, cultural, individual diversity inside the classroom. We faced many obstacles to promote equality and equity base teaching. So there is a big challenge to promote social justice in multicultural mathematics classroom. In this context my research and its findings will be significant and fruitful to promote social justice in mathematics classroom. The significance of this study were:

- ) It helps teacher to know about social justice in multicultural mathematics classroom.
- ) It is helpful to promote equality and equity based teaching.
- ) It is helpful to make the inclusive classroom teaching.
- ) It is helpful to make collaborative classroom teaching.
- ) This study is also helpful to decrease social discrimination.
- ) It also helps the parents and common people to create better environment and aware them about the inequality and injustice, and also create the positive attitude towards teaching.

This study is also helpful to connect mathematical knowledge with social issues.

### **Delimitations of the Study**

It is the study on "Strategies used by Mathematics Teacher to Promote Social Justice in Mathematics Classroom." The delimitations of the study were pointed out below:

- ) This study is related to research of Mathematics Education.
- ) The area of this research was delimited to Kirtipur, Kathmandu.
- ) Only the two teachers and seven students from class eight and nine and five students for focus group were selected as sample who were teaching and studying mathematics in Kirtipur Secondary School.
- ) The teachers and students as sample were selected from compulsory and mathematics, from class eight and nine.
- ) The participants were selected purposively and data were gathered only from classroom observation and in-depth interview.

### **Operational Definitions of the Key Terms**

**Social justice.** Social justice in mathematics education refers to teach all type of students without gender discrimination, economic discrimination, cultural discrimination, ethical discrimination, religious discrimination and to provide a situation of all students having equal opportunity to read and learn in mathematics classroom.

**Equity.** Provide an opportunity according to their individual interest, ability and individual difference.

**Equality.** Provide equal opportunity for all students where individual ability, interests are not concern

**Diversity.** Diversity means understanding that each individual is unique, and recognizing our individual difference.

**Teaching-learning.** An activates done inside a classroom for gaining and sharing of knowledge based in a fixed curriculum.

## **Chapter-II**

### **Review of the Related Literature**

The review of related literature provides the strong and depth knowledge to the researcher to find out the area of the problem and also the gap which leads the researcher to find out the knowledge or ideas that haven't been existed before by others. The literature review is a foundation for the study and is a discussion of knowledge that is given and carried out by the several researchers and other scholars. The review also helps the researcher to come up with a theoretical frame work to guide the study.

#### **Empirical Review**

For the supportive information of the research, some of the related theses have been reviewed here in this section.

Acharya, (2015) has presented a research article on "Inclusive Mathematics Classroom Practice in School of Arghakhanchi District." He used classroom observation and in-depth interview as a data collection tools to collect the data. In this article the researcher concluded that appropriate and effective instructional methods were the important pillars of classroom activities in inclusive mathematics practice.

Acharya, (2017) wrote an article entitled" Factors Affecting Difficulties in Learning Mathematics by Mathematics Learners." The main purpose of this study was to explore the causes of learning difficulties in mathematics. The design of the study was qualitative. Classroom observation and interviews of the teachers and students of three schools of Arghakhanchi district were conducted to the participants to achieve the research objective. Through this study it was found that students, teachers and parents have to play an important role as key and provider of sound environment for the improvement of pass rate respectively. The finding of this research explored that

the linkage between new mathematical concept and previously learned mathematics structure, mathematics anxiety, negative feelings towards mathematics, economic condition and their educational backgrounds, school management system, lack of infrastructure in school and lack of regular assessment system of school were the main causes of difficulties in learning mathematics.

Acharya (2015) conducted a research on “Relevance of Primary Level Mathematics Education in Nepal: A Cultural Perspectives” by using ethnography research design. He found that there was a huge gap between the practices and theory of culturally responsive teaching-learning process. Similarly, the medium of instruction was found to be key challenge in multicultural classroom teaching-learning process. De/contextualization of mathematical teaching -learning activity, incompetent teacher in teaching mathematics in multicultural situation, mono-cultural pedagogies, and contents dominated by ideologies of western culture were the challenges of mathematical education.

Panthi (2017) has carried out the research in "Promoting Equity on Mathematics Classroom". The main objectives of this study were to explore the teacher's perception of equity in mathematics classroom and to investigate the challenges for teachers to promote equity in mathematics classroom. The study was qualitative in nature and an interpretive paradigm has been used as research approach. He found that the teachers require social and political awareness and teaching skills in order to be able to maintain equity in mathematics classroom. He also found that the teachers were using different teaching techniques, such as inclusive and participatory, in their classroom. The teachers view that collaborative teaching and learning technique is appropriate for ensuring equity in mathematics classroom as it provides rich learning opportunity for all students.



Ogbu (2000) conducted a research on the cultural difference and cultural discontinuity theory and have found that the students whose home environment is similar to the culture of school, they can easily get better learning achievement and the students whose home environment is different to the culture of school, these students do not have enough attention in their learning. But the researcher stated that the gap between the minority culture and the mainstream culture does not favor schooling.

Giri (2018) carried out the research entitled "The Case Study of Class of Low Achievement of Disabled Student in Mathematics." The objectives of this study were to analyze the causes of low achievement of disabled student in mathematics at grade x and to explore the learning environment provided to disabled students. In this study in-depth interview and cross-matched methods were used as research tools. The findings of this study showed that there was the negative attitude and less interest of disabled students on mathematics learning. Due to the economic conditions, parents, literacy language problem the students were not able to understand mathematics. The home environment and school environment were not supportive for mathematics learning. Disabled students receive the dominant behavior at school and students had no sufficient teaching materials.

Guragain (2016) conducted a research on "Exploring Language Difficulties in Learning Mathematics." The objectives of this study were to find the language difficulties of the students in mathematics learning and to analyze the effect of language difficulties in learning. It is qualitative research with exploratory design. In this study questionnaire schedule, class observation form and clinical interview were used to collect the data. The findings of the study indicated that the student's language difficulties lied in two categories. The first one was semantic difficulties which

includes that students suffer in mathematics due to specific terms, terms having different meaning in other discipline, signs, the use of sign and sign rules, symbols and notations of mathematics. Similarly the second difficulty was syntactic difficulty: the difficulty in the use of language. Mathematics need to be explained with the help of language. Every language has its specific formal structure and pattern which is called the syntax of the language. Due to poor understanding of the structure, it became difficult to understand, observe, internalize and explain the topic to each student.

Jong and Jackson, (2016) conducted the research on the title "Teaching Mathematics for Social Justice: Examining preservice teacher conceptions." The purpose of this study was to examine elementary preservice teachers' conceptions of teaching mathematics for social justice at the beginning and end of the mathematics methods course. Pre service elementary teachers (n = 230) enrolled in mathematics methods coursework at three universities across the United States. The findings were the range of themes presented were consistent with various conceptualizations of teaching mathematics for social justice in the literature and pre service teachers enter into mathematics methods courses with promising ideas about teaching mathematics for social justice and are able to make important connections between teaching mathematics and social justice.

Lamichhane (2001) has conducted a research study entitled "A Study of Problem Faced by Secondary Level Mathematics Teacher in Teaching Mathematics in Kaski District" and found inadequacies of text book and teacher guide, lack of supervisors help, lack of physical facilities etc. were the major hindrances' in effective mathematics classroom as well as teaching and learning. Further he argued that the motivation to learning mathematics is poor on the part of students.

Neupane (2016) conducted the research on "Inclusive Mathematics Classroom Practice in Rasuwa District." The objectives of his research were to identify the situation of mathematics classroom practice from inclusive perspective and to explore the perception of mathematics teacher about pedagogy on inclusive mathematics classroom practices. Direct classroom observation and semi-structured pedagogy were the main tools of his research. The researcher found that the female participants were poor in classroom and the teachers could not implement theoretical knowledge in classroom practically. So, the researcher concluded that appropriate and effective instructional methods were important pillars of classroom practices. Addressing multi-cultural, multi-lingual and multi-religious students, classroom management, group activities, interactive activities among learners, adapting proper teaching material were the main factor of inclusiveness.

Panthi, Luitel&Belbase (2018) conducted a research on the topic "Teacher Perception of Social Justice in Mathematics Classroom." The purpose of this study was to explore the mathematics teachers' perception of social justice in mathematics classrooms. They applied interpretive qualitative method for data collection, analysis, and interpretation through interactive process. They administered in-depth semi-structured interviews to capture the perceptions of three mathematics teachers about social justice in mathematics classroom at three public secondary schools in Kathmandu. They found five themes on perception of social justice from the analysis of the data. These themes were associated with - equality, equity, fairness, social process, and caring students. Implications of the study have been discussed at the end of this research.

Poudel (2016) conducted a research on "Mathematical Classroom Management a Multicultural Perspective." The aim of this research were: to

investigate the mathematics classroom management in school at lower secondary level from multicultural perspective, to identify the instructional strategies promoted for the well managed mathematics classroom, and to find out the problem of managing classroom from multicultural perspectives. Interview, observation and school documents were the major tools of data collection. The researcher found that multicultural beliefs and perception has directly and indirectly affected the classroom activities and management. Students, teachers, classroom environment, teaching-learning process, role play method, freedom for speaking, negligence of their language, cultural belief , negative attitude towards the teacher, lack of the resources in multi-language, misunderstanding of teacher are the major reasons for not having the managed mathematics classroom. He further argued that all issues seemed much complex, important and problematic in Nepalese context because of its multicultural characteristics and multi lingual difference.

Shrestha (2016) studied on“Cultural Diversity and Difficulty in Teaching Mathematics. The objectives of this study were to identify the difficulties in learning mathematics of culturally diverse students at school and to explore the relationship between culture and learning mathematics. Ethnography approach was used to explore the multiple realities through the method of observation, in-depth interview and document analysis. He conclude that the culturally diverse students had many difficulties in learning mathematics due to pupils’ weak perception on mathematics lack of culture friendly curriculum materials and traditional teaching and learning activities. Family’s socio economic status, discrimination in classroom were the difficulties of students at school.

## **Theoretical Review**

The theoretical review is supposed to help the researcher make logical sense of the relationships of the variables and factors that have been deemed important to the problem. It provides a definition of relationships between all the variables. So the researcher can understand the theorized relationship between them. Theoretical review guides our research, determine what things we have to measure, and what relationship we have to look for. There are many theories which are related to mathematics education. I have included the following theories for describing and analyzing the data:

**Theory of Fairness.** Provide equal learning opportunity without any discrimination is called fairness. This theory refers that teacher makes the learning environment in which students can learn without any biasness and domination. According to Panthi, Luitel & Balbase (2018) the perception of fairness connects to teaching without bias, providing students equal chance to learn, and transparent classroom activities, promote social justice in mathematics classroom. Fairness does not mean that making things equal. It is to respond to students of different ability and different needs variously.

This theory is related to social justice in mathematics education. It suggests the mathematics teacher to teach classroom according to main theme of fairness.

**Theory of Inclusion.** According to the theory of inclusion every child has unique characteristics, interests, abilities and learning need. So, the children have to get equal learning opportunity according to their differences. According to Wheeler (2010) "Possible areas of inclusion are socio-economic status, cultures, linguistic group, religion, geographical, gender, physical and mental health, ability status." This

shows that theory of inclusion focuses on a group who were not in good and equal access to education.

United nation focuses on every child has a fundamental right to education and must be given the opportunity to achieve and maintain an acceptable level of learning. So that theory of inclusion is related to social justice. By the help of this theory we can maintain the social justice in mathematics classroom.

**Theory of Equity and Equality.** Theory of equity believes that every student has to get rights according to their abilities. This theory focuses on individual interests, needs and abilities. This theory promotes learning with their cultural diversity. In this context, Acharya (2018) states, "Disadvantaged students are more likely to perform poorly at school due to different home circumstances and the practices of school mathematics not aligning with the knowledge, skills and dispositions the students bring to school. And discourse of equity subscribes to the principle of justice and differences." Panthi (2017) says, "Equity refers to the way of treating on the basis of student's ability level, i.e. providing equal opportunity to the students in classroom."

Also theory of equality is not a condition about trying to make inequalities fair or giving people equal opportunity to become unequal but about ensuring recognition, love care and solidarity, power and working and learning. In this context Acharya (2018) says, "It is important that all students are given fair chance at succeeding, so all students should be given the same opportunity. It is up to the student to choose which option they want. If they want to be succeed, then the opportunities should be provided for them. And further he says "Discourse of equality subscribed to principles of fairness and choice".

### **Filling the Gab**

According to my literature review, some researchers were researched on the topic of social justice. But researchers were not researching on the field of teacher's strategies for promoting social justice in mathematics classroom. So I noticed the gap between the previous existed literatures and my present topic. Thus, to fulfill this gap I was motivated to study on this topic and I believed, my research has filled the gap.

### **Conceptual Framework**

A conceptual framework represents the researcher's synthesis of literature on how to explain a phenomenon. It maps out the actions required in the course of the study given by his previous knowledge of other researchers' point of view and his observations on the subject of research. It is the researcher's "map" in pursuing the investigation.

The conceptual framework "sets the stage" for the presentation of the particular research question that drives the investigation being reported based on the problem of statement. I have developed a conceptual framework for this study shown in figure below.

This above presented conceptual framework is the overall map of the research. It provides the information about what were included in this research and also the ways of maintaining social justice inside the classroom in a diagram. It also reveals the methodology of the research. The data collection tools as well as the related theories were also presented in the chart.



## **Chapter-III**

### **Methods and Procedures**

This chapter describes in details about the research of the study, some of the study tools and data collection techniques. The methods and procedures adopted in this research have been described below.

#### **Research Design**

Research design can be categorized into qualitative, quantitative and mixed design. To find the strategies used by teacher for promoting social justice, I used qualitative research design. This was the case study research approach. Naturalness, data description, symmetric study, presence of deep meanings were their characteristics. Qualitative research was a form of inquiry. Observation, interview, etc. were the tools to collect the data and information.

#### **Study Area**

Social justice is guided by the principle of equity, equality and inclusiveness. For my research, I had collected data from the school of Kirtipur Municipality.

#### **Participants of the Study**

This is qualitative research design. I used purposive sampling for choosing the participants. According to Bernard, Lewins&Shepard (2018) the purposive sampling is "the researcher decides what needs to be known and sets out to find participants who can and are willing to provide the information by virtue of knowledge or experience." So I took interview of two mathematics teachers and seven students from grade eight and nine and conducted a focus group discussion of five students as my sample from secondary level of my study, from Kirtipur municipality.

## **Research Tools**

Research tools are the important part for data collection. The main tools for data collection for this study were classroom observation, semi-structured interview and focus group discussion. By using these tools I had collect the data for my study.

**Classroom Observation.** Classroom observation indicates that the researcher enter and know the situation that is being. In my research I observed the mathematics class of grade seven and nine for 25 days. For this, I prepared classroom observation form and filled it at the time of observation.

**Semi-Structured Interview.**Semi-structured interview consists of several key questions that helps to define the areas to be explored, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail. For this I took semi-structured interview of mathematics teachers' and students' of grade seven and nine. To conduct the interview I prepared some questions before taking interview and went to the participants. At first I build up rapport with the selected respondents and asked their time for interview. With their permission, I took interview with them with the help of the prearranged questions. I also requested them to give me permission to record their interview in my mobile.

**Focus Group Discussion.**Focus groups share many common features with less structured interviews, but there is more to them than merely collecting similar data from many participants at once. A focus group is a group discussion on a particular topic organized for research purposes. The optimum size of a focus group is six to eight participants (including researcher), but focus groups can successfully with a few as three and as many as 14 participants. For my research I formed a group of five students and conducted a discussion session.

### **Data Collection Procedure**

For the data collection procedures, at first I visited to the selected school and gave information about my objectives of visiting such school to the principal. Then with the permission of head teacher, I met the teachers and students of grade eight and nine of that school. At first, I talked to them and selected the required sample purposively. After that, I built rapport with them and also shared my main objective of going and meeting them. I gave all the information about my research and requested them for help to provide the authentic data with them. I interviewed those teachers and students in different days according to their interests. I had recorded the interview in my cell phone and transcribed it later. For the observation also, at first I informed the subject teacher and with their permission, I went to their classes and observed to obtain my objectives with the help of observation form that had prepared already. Likewise, for the focus group discussion, I informed and gathered five students of the classroom and the teachers of the school and conducted the discussion in an effective way by using several questions. In that focus group discussion I myself played the role of note taker and I kept one moderator to conduct the discussion. I took notes and listed out the main ideas drawn from the discussion with the help of the moderator at last, which were fruitful for my study.

### **Ethical Consideration**

Ethical consideration is one of the most important parts of the study. To make my research ethical, I had collected the data with the permission of the respondents and their privacies were highly preserved. I hadn't used their real name but pseudo names. I kept my research free from plagiarism by citing others ideas where necessary and not using others exact ideas, I kept the data safely.

### **Analysis and Interpretation**

According to Creswell (2007) "Data Analyzing in Qualitative Research Consists of Preparing and Organizing the Data. For analysis, then reducing the data into theme through a process of coding"

For my research, I coded the data into the meaningful segment and assigned names for the segments. I combined the similar type of coded information and generated themes. I had put the similar type of coded information into one theme and displayed and compared the data. After the comparisons of data, I used triangulation methods for analyzing the data. I also analyzed the data with the help of my empirical and theoretical literature review.

### **Quality Standard**

After completing the construction of the research tools, we have to maintain quality standard of the research. For maintaining the quality standard Guba and Lincoln (1998) suggests four criteria: credibility, transferability, dependability, conformability. So I maintained quality standard according to these areas same as Guba and Lincoln.

**Credibility.** Credibility is the key criteria of the quality standard in qualitative research. According to Guba and Lincoln (1985), "Credibility is similar to internal validity in positivist research, confidence in the 'truth of finding'." To maintain credibility of my research I gave more time for interview, classroom observation. I also gave priority on focus group discussion.

**Transferability.** Transferability is in preference to external validity in the positivist approach. Guba and Lincoln (1985) "Transferability showing that the finding have applicability in other contexts." To maintain transferability, I took photos of classroom teaching and practice in my research.

**Dependability.**Dependability is in preference to reliability. It shows that findings are consistent and could be repeated. For this I took rational idea to select the people. Also I tried to ensure credibility and transferability to maintain dependability.

**Conformability.**Conformability focuses on objectivity. Guba and Lincoln (1985) "conformability refers a degree of neutrality of the extent to which the finding of a study are shaped by the respondents and not researcher bias, motivation or interest. So, to maintain conformability, the findings were based on the participants' data. The participants' ideas and experiences were highly respected and focused.

## **Chapter-IV**

### **Analysis and Interpretation**

This chapter is related to the analysis and interpretation of the collected data. In this Chapter, I had addressed my research questions; how does the teacher uses strategies to promote social justice in mathematics classroom? And why does the teacher faces challenges in maintaining social justice in mathematics classroom?

In order to fulfill research question and to achieve the objectives of my study, the qualitative research was used to collect data and to solve the research problem. It was a case study research design which searched the strategies used by mathematics teacher to promote the social justice in mathematics classroom.

In order to seek the answer of these questions, I reached Shree Kirtipur Secondary School at Kirtipur municipality. I met the head teacher and informed him about my purpose to visit the school. The head teacher gave me a permission to observe the class and to take an interview with students and mathematics teacher of grade seven and nine.

The data were analyzed and interpreted by coding, theming, categorizing and triangulation of collected data. This chapter is divided into two sections. Section I discussed about the strategies used by mathematics teacher to promote the social justice in mathematics classroom and section II discussed about the challenges faces by mathematics teacher to promote the social justice in mathematics classroom.

#### **Section I: Strategies Used by Mathematics Teachers to Promote Social Justice in Mathematics Classroom**

This section describes with the strategies used by mathematics teacher to promote the social justice in mathematics classroom. I found six major themes from the collected data.

**Providing Equal Opportunity.**Equal opportunity means providing equal teaching-learning activities for all students. Equal opportunity is not about the benefit of one students; it's about the benefits of every students involving teaching-learning process. During the classroom teaching and learning,students must get same and equal opportunities in learning and also the same behavior as well as value from teacher. In this context, I observed the classes of mathematics education teachers.

*When I entered the classroom, teacher was teaching mathematics in grade seven. At first, the topic of the lesson was introduced by the teacher. During the teaching the teacher gave same classwork and treated equally for all the students. Also the teacher focused all the students equally and asked same questions to all the students.*

Also I conducted interview with the mathematics teacher. I have recorded interview in my mobile. I asked " How do you give classwork and homework; equally or differently? How do you ask questions to the students? How do you care them?" The teacher replied

*I always give the same questions for homework to all the students. I do not give different questions for weak and talent students for classwork. At the time of teaching; I frequently ask the same questions to the whole class and I equally treat each and every students in the class. And I always try to make feel the students that I have treated them equally.*

During the interview with one student, I asked some questions. "Does your teacher give same homework and classwork to the students in your class? Does your teacher care you more than other?" Do you think that your teacher behaves you equally with respect to other students?The student replied

*The teacher does not give different homework for me. During the class, our mathematics teacher cares and behaves me equally as like other friends. Teacher asks same question for all students and solves the solution of difficult problem on board.*

In focus group discussion the students replied

*Teacher asks equal and same questions for all of us. Also the teacher behaves us equally. The teacher provides equal opportunity in learning and provides same homework for all of us.*

From the above information of classroom observation and interview, it was concluded that the mathematics teacher asked same question for all the students. Also students were equally focused by the teacher. The teacher gave same homework and classwork for all the students. The teacher solved the problem of students on the white board so that everyone can understand equally at the same time. The teacher respects each and every student's problems and their abilities. Therefore, it helps to promote equality in the classroom. From the collected data, it represents that the teacher treat every students equally. To support this view, Acharya (2018) says, "It is important that all students are given fair chance at succeeding so all students should be given same opportunity". Also according to Lynch (2000) most of the discussion about equality in education focused on how to equalize access to and participations within different levels of formal education for different social groups. Also theory of equality focuses to promote equal opportunity for all students.

**Individual Treatment and Providing Extra Time.** Every member of the society provides every student/child, the basic work skill of reading, writing and other personal support, personal feedback, instructional quality of teaching etc. to make the students engage in learning and to make them autonomous which depends on also in the ability of teacher in teaching. Teacher can teach individually by peer-support,



individual support and feedback, making relationship with them and team building and managing the time. During the class observation, I focused on the teacher's strategies towards weak and talent students. When I observed the class, I found the following activities inside the classroom.

*The teacher entered the class and started to teach. The teacher focused for all students while teaching and some time he asked question individually.*

*Especially, the teacher focused weak and marginalized students. Sometime teacher asked some medium range questions for weak and marginalized students and some difficult questions for talents students to respect their individual abilities. While checking classwork, the teacher provided the corrective and necessary feedback for the students individually and also helped to do the work especially for the weaker students. The teacher gave more time for weak students and also gave extra questions for them to make them talent like other.*

Also I took an interview with the students. I asked to them, "Does your teacher help you individually? If so, when? Does your teacher give extra time for teaching and learning? Students replied

*Sometimes the teacher helps me and my friends individually. When I feel difficult to solve the problem, the teacher helps me individually. When I face problem during learning and doing task, the teacher helps me individually. If necessary, the teacher provides extra classes with the help of school administration.*

With the interview of teacher, I asked, "Do you treat the students individually?" How? Do you give extra time for the students? The teacher replied

*From the longtime of teaching experience, I can easily observe the abilities of the students as talent, medium and weak students. With the limitation of time, it is difficult to teach each and every student individually. But I especially focus on weak and medium students. At the time of checking homework and classwork, I check individually. If students raise question during the teaching; I try to solve for the whole class and again if the students face problem I do help them individually. Sometimes, I give extra questions for talent students. Also, I ask questions according to the student's level. I take extra classes with the help of head teacher and parents. In my leisure period, I help students to learn by providing them several techniques of learning.*

From focus group discussion, students replied

*When we face problems during the teaching, teacher focuses us individually. Sometimes, the teacher teaches us by giving extra time.*

From the above information it was found that the teacher promotes social justice in mathematics classroom by helping the students individually and by providing extra time for students to learn. The teacher tried to maintain the equal access of education to the students by providing the remedial teaching for the weaker students. It was also found that the teacher checked the homework and classwork individually and gave corrective feedback individually. From the interview, focus group discussion and the classroom observation, it was concluded that the teacher asks questions according to the individual abilities of students and the teacher helped students individually when they cannot understand during the classroom teaching. Mathematics teacher has been taking an extra time according to the need of students with help of head teacher. The teacher was always ready to help students in leisure

time. In this regards, Panthi (2017) says that equity refers to the way of treating on the basis of student's individual ability level.

**Loving and Motivating Students.** Love and motivation play an important role in classroom teaching. Students need love and affection of the teachers to learn effectively. The teaching-learning process becomes more effective if the students are not afraid with their teachers. During the classroom teaching, students want good behavior, polite language and flexibility from their teacher. Also, when the teacher motivates students to learn mathematics students become more active and creative so they can easily understand the content they were taught. The motivation of teacher helps to remove the bad concept of mathematics on students.

Students actively involved in classroom activities by the motivational speech and behavior of the teacher. For my research, I did a classroom observation and took an interview of grade seven and nine teachers. From the classroom observation I found that

*The teachers called students by using polite language. The teacher taught the lesson by using simple and respectful language. Students seemed to be loved and cared by the teacher. During the classroom observation, I saw that the teacher cared all students respectively. The teacher motivated students to ask questions and to solve the problems. When students asked questions, the teacher answered very softly and gave thanks for asking the questions. When students felt difficulties during the teaching, the teacher motivated the students by saying that nothing is hard and difficult. The teacher always encouraged and praised the students and loved and cared all students with motivation during the teaching. Which lead the students towards the successful learning.*

In the interview, I asked mathematics teacher, " how do you behave with students?" What kinds of language do you use during teaching? How do you encourage and motivate students towards learning? The teacher replied

*I use polite languages for all the students during teaching. I love and encourage all the students equally. I love the students who ask me the question. I encourage and inspire them to ask more questions and to solve the problems themselves to follow the learning by doing principles. During the teaching I use soft language. Students are not afraid and hesitate with me to discuss in the classroom. I also inspire them to study and practice more. I have said them that mathematics is not hard subject, if you practice more it is too easy. Sometimes, we also conduct an extra motivation class for students.*

I also took an interview with student. I asked, " Does your teacher love you? How does the teacher inspire you to practice mathematics? While answering these questions one student responded

*My mathematics teacher loves me a lot. The teacher loves all of us. The teacher cares me too when I'm in trouble and in difficult situation. When I ask question she becomes happy and answers me well. Teacher calls me by using loving word. She says, "Mathematics is easy subject". Teacher encourages us to practice more and more. She always inspire me to study and practice mathematics.*

From focus group discussion

*Our mathematics teacher loves all of us equally during the teaching. The teacher motivates and inspires us to study and practice mathematics.*

From the above discussion, I concluded that the teacher loved, motivated and cared the students equally to promote social justice in mathematics classroom. The

teacher called students by lovely words and soft language. The students were always helped by the teachers. The teacher was never angry to answer the question asked by the students. Teacher always inspires and motivates the students to study and practice mathematics.

**Using Teaching Materials.** In mathematics, teaching materials are those materials which help students to understand mathematics more easily. Also, teaching materials are those tools that classroom teacher uses to help students to learn quickly. The importance of teaching materials shows by the Chinese proverb "If I hear I forget, I see I remember, if I do I know." Teaching materials help to bring learners into direct contact with object. They help to clarify the points explained in the word. There are visual, audio-visual, manipulated, printed and so many materials.

*During the classroom observation I saw that the teacher sometimes use the teaching materials when necessary. I also saw that the school administration has managed the place to put teaching materials. I also found an extra mathematics lab for the students. During observation, I found the teacher used concrete teaching materials to make the abstract content easy and understandable.*

In the interview with teacher, I asked, " when do you use the teaching materials?" "What types of materials do you use?" The teacher replied

*Yes, sometimes I use teaching materials when necessary. At the time of giving new concept, I use appropriate teaching materials which may be concrete, visual, printed, pictures or manipulative. Finally, to make clear about the concept I use teaching materials.*

I also asked with the student, "Does your teacher show any picture? Figures or videos during teaching? Then student replied

*Yes, sometimes our teacher shows some concrete objects, videos and picture during the teaching. Mostly, the teacher uses concrete objects rather than pictures or printed materials. It helps me to understand mathematical concept clearly.*

From focus group discussion, Students replied,

*Sometimes our mathematics teacher uses materials to teach us. It helps us to understand mathematics very easily.*

From the above information, I found that the teacher uses teaching materials which helps to learn the abstract contents easily, basically for the weaker students. It provides the equal opportunity of learning inside the classroom for all the students that lead towards the social justice in mathematics classroom. Mainly the teacher used concrete teaching materials. He used it during the new topics and in teaching the difficult concept. Sometimes the teacher helps the students to visit mathematics lab. Students understand mathematics easily with the help of teaching materials. The use of concrete materials seems to be assumed unquestioningly. Doff (1998) says that visual materials can provide the situation which lights up the meaning utterance used where audio materials can help teacher to improve their teaching strategies and to prepare more effective lessons.

**Managing the Classroom.** Classroom management is the skill of teacher in which the teacher uses to create successful learning environment. Classroom management contains the uses and management of white board, desks and benches, students sitting, classroom sanitation, appropriate light, air, commanding voice of teacher, management of marginalized students, time management etc. From my classroom observation I found

*The classroom was very clean. The whiteboard was in front of the class which can be seen easily from last bench of the class. There were appropriate and*

*required numbers of desks and benches to sit for the students. All students can easily listen the voice of teacher. The condition of light and air was good. The decoration of the class was fantastic which attract the students easily.*

I took an interview with teacher. I asked "how you have managed your classroom." The teacher replied

*Classroom management is the important part of teaching-learning process. Especially, I focus on the use of white board and students sitting. Students take their sits according to the system of rotation. For special needy students, I manage them an appropriate and comfortable sits. I also manage appropriate time to check homework, classwork and for teaching. Also, I speak loudly and in clear voice which helps all students to listen my sound.*

To know the student's response, I asked students, "How does the teacher manage your sit? Do you see white board clearly? Do you listen the voice of teacher? Who cleans your classroom?" The students replied

*We take our sit by the rule of rotation. We can easily see a white board and I can listen the voice of teacher clearly. We feel comfortable to sit inside the classroom. Our classroom is very clean. There are separate people for the sanitation of our classroom. The condition of air and light in our classroom is good.*

From focus group discussion students replied,

*We feel comfortable to sit inside the classroom. We can easily see a white board and can easily listen the voice of teacher.*

From the above information, it was concluded that the teacher has well managed the classroom effectively to promote the social justice. For the classroom management, the teacher focused on managing students sits, use of white board and

so on. The teacher focused on time management for classroom teaching and homework checking. The mathematics voice was audible to all the students. The responsibility of cleaning the classroom is given for one person by paying to him or her. The teacher always makes alert about the classroom decoration and its condition to the administration. In this regards, Poudel (2016), found that multicultural belief and perception has directly affected classroom management and activities. Students, teachers, classroom environments, teaching-learning processes, role play methods, freedom for speaking, classroom decorations etc. are the main themes of classroom managements.

**Making Classroom Inclusive.** Inclusive classroom involves the students from different gender, ability, casts, backgrounds, geographical regions etc. The teacher has to integrate these types of students in a single classroom. Management of different types of diversity in the classroom is important facts in our country. The representations of all cultures, genders, geographical regions and different abilities students in mathematics classroom is called inclusive classroom. From my observation of mathematics classroom I found

*The boys and girls were sitting together. The teacher focused and asked some questions all the students representatively. Students were from Terai region, Himalayan Region and hilly regions were sitting together and had good bond of friendship. They had similar type of learning opportunities inside the classroom unless they have diverse abilities. The teacher also focused on different types of students.*

I conducted interview with teacher and I asked, "How do you provide learning opportunity for girls? Students from terai region? , Students from marginalized group of people? , Weak students and other? The teacher replied



*I provide different chances for girls. I encourage them to participate in learning activities. I give chance to solve the problem on the board. I also love the students who were from different geographical region, especially from Terai region. I also focus the students who are from poor family background. I try my best to make my classroom teaching and learning inclusive by involving them in same learning activities.*

I asked a question to one of the student from Terairregion, "Howyour teacher do behaves towards you?" She replied

*My teacher loves me a lot. My teacher provides an opportunity to solve problem on the board.The teacher always focuses me during teaching and learning. My teacher asks a lot of questions to me.*

Also I took an interview with two other girls, about their participation in teaching and learning process, they replied

*Our teacher always focuses us during the classroom teaching. The teacher motivates us during teaching and learning process. Mathematics teacher provides different opportunity to do mathematical activities on board. In extra curriculum activities, our teacher always includes at least one girl. Our teacher advices to sit all students together like a family.*

From the above discussion, it was concluded that the teacher makes classroom inclusive to promote the social justice in mathematics classroom. The teachers focused girls and different geographical region's students and provide enough opportunity for learning and develop their competencies. The teacher also loves and supports students who were from different geographical region. The teacher always alerts to manage the diversity in mathematics classroom. In this regards wheeler (2010) says possible areas of inclusion are gender, geographical, religion, linguistic

group, socio-economic status, mental-health ability. Also Neaupane (2016) conclude that addressing of multi-culture, multi-lingual s students, group activates etc. are the main pillars of inclusive classroom.

## **Section-II: Challenges of Teachers in Maintaining Social Justice in Mathematics Classroom**

In this section, I have discussed about why the teachers face challenges in maintaining social justice during classroom teaching. For this, I have observed the class, interviewed with teachers and students and conducted focus group discussion to collect the data. On the basis of this data, seven themes were generated.

**Different Mental Ability.** The ability to understand, remember and recall the things taught by the teacher is different in students. Thus the ability to achieve, understand and to use any things by the students is known as mental ability. Some students understand quickly, some students understand quite slowly. Some students understand quickly by one method and others may need other methods. From classroom observation I found that,

*During the class, talent students seemed to be more active than the medium and weak students. Talent students responded quickly whereas the medium and weak students responded with the help of other students. Similarly, talent students solved the classwork immediately but the medium and weak students were in need of the help of teachers and friends.*

During the interview with teacher, when I asked the teacher, "what kind of challenges do you face during the mathematics teaching?" The teacher replied

*Talents students understand quickly whereas it is so difficult to make understand to the weaker students. Talent students do their homework and*

*classwork very well. Weak students need maximum help. There is a clear difference between weak and talent students' abilities.*

During the interview of the students, I asked with first student of the class, he replied

*Mathematics is very easy subject. There is no any problem in classwork and homework after the teacher teaches us. I don't feel difficult to answer the question asked by the teacher."*

Similarly, the student having last roll number said that *"I feel mathematics hard. I cannot understand quickly as like as other friends. I need the help of teacher and my near friends to solve classwork and homework."*

From focus group discussion

*Some talents students in the class felt mathematics easy whereas some weaker and medium students felt difficulties.*

From the above information, it was concluded that due to the different mental abilities of the students in the class the teacher felt challenge to maintain the social justice in the mathematics classroom. It was seen that it is difficult to teach the talent and weak students together. Talent students understand quickly and weak students need additional time to understand so it is seen that teacher felt difficulties in teaching by keeping the different abilities students in a single classroom. Due to the differences in student's mental ability, it is difficult to choose teaching methods, the level of question, time to provide for the students to choose the subject content for teacher. So the teacher felt challenges to maintain the social justice in classroom due to the diverse abilities of the students.

**The Limitation or Boundary of the Time.** There is a time limitation for teaching in any school for each subject because the specific period of time is

categorized for the subjects. Teacher has to teach on the basis of this fixed limitation of time. Teacher has to enter the classroom with planned objectives, methods, or teaching materials that should be used to finish on specific point of time. So it is clearly seen that, time is very much important in teaching-learning. But if there is not enough time, there may be some difficulties to teach from the students centered methods. From the classroom observation I found

*During the homework checking in the classroom, I saw that teacher could not provide feedback to students due to the limitation of time. Similarly, I found that teacher could not treat the students on the basis of individual ability. To the completion of the course on time, teachers could not allow presentation to the students on the daily basis.*

On this context, when I interviewed the teacher, he replied

*I feel difficult to teach the students according to the student's ability due to the limitation of time. I try to make each and every student's to solve problem on the board but, it has been always difficult by the time limitation, so all the students could not get time opportunity to take part in the activities. The compulsion of completing the course on fixed time, I fell less time to teach mathematics subject.*

On the same context, I asked the students, "How long does your teacher provide time? How often do you participate in group discussion or question answer section? The student replied

*Though the teacher provides individual time for me, I always fell insufficient. I only sometimes get opportunity to solve the problems on white board. Teacher*

*teaches us quite fast. It would be easy and better if the teacher teaches more time to make us understand.*

On the same topic, from the focus group discussion students replied,

*We may feel easy if the teacher provides more time to teach us individually. It would be better if the teacher gives more time to teach and make us understand.'*

From the above information, I concluded that the teacher felt a challenge to maintain social justice due to time limitation. To provide individual time, to teach according to the student's ability, to use students centered methods during teaching and to make clear the concept of content; time limitation is seen as the main obstacle. Due to the limit time the teachers had the burden of completing the course in specific time and may felt to teach the students effectively by engaging them to practice.

**Different Family Background and Environment.**Family background has an important role and impact on students learning. Most of the families have to struggle and hard and labor to make their children educated. Due to this, such families could not provide enough time for their children education whereas families of good background helps their children's in education by providing enough time to them. It has a direct effect on teaching-learning activities in the school. In this context, when I observed the classroom, I found

*Active participations of the students are mainly from the good family background inside the classroom. However, there are no active participations and better achievement of the students from low class family backgrounds.*

Similarly, in this context, during the interview with teachers, one teacher replied

*Students and their behavior's from the different family background is the main challenge which I feel during the teaching. There are some students who goes*

*along with their parents to work with them during holidays. Such students cannot give enough time for their studies.*

In the interview with students, I asked with students "How much does your parents support in your studies?" How is your study environment at your home? On the answer of these questions one student replied

*Father and mother encourage me to study. They do not force me to work during study.*

Similarly next students told

*I do study sometimes at my home. My parents return home in the evening from work."*

Similarly from the focus group discussion

*Our parents encourage us to study and practice at home. It feels easy in the classroom when we study once at home. It is difficult to remember, if we do not repeat the classwork at home.*

From the above information, I concluded that the teacher felt a challenge to maintain social justice in mathematics classroom due to the different family's background of students. There is an interrelation between student's family's background and their learning process. From the above discussion it can be also said that the students from good family's environment understand easily because they get enough time and good learning environment from their family whereas it is difficult to understand to the students whose family's environment background is not good because the students may have to work hard at their home due to the poverty and poor economic background. So their parents also couldn't guide them like the rich family's background and could not get chance to read at home. In this regards Ogbu (2000) says "Those children, whose home is much similar to the culture of school, can scope easily with the system that may result better learning achievement. Similarly, the

children with unmatched or dissimilar home cultures with school cultures and those who do not have enough attention in their learning has not better learning achievement.

**Lack of Interaction.** The discussion and conversation between students to students or students to teacher in the classroom is called interaction. Similarly, it is an interplay between pupil-pupil, pupil-teacher and pupil-material. Interaction plays a significant role in effective and meaningful teaching and learning. It is a way of making the students active and autonomous. The discussion between students to students or teacher to students on a specific subject or topic is also known interaction. In this context, when I observed the classroom I found,

*Though the teacher asked few questions they were not enough for the student while teaching. The interaction between students to students were not sufficient. Teacher also did not make proper discussion group for discussion between the students.*

Similarly during the time of interview with students about classroom interaction and discussion, the teacher replied

*Students do not involve in proper interaction. They do not share known or unknown things properly. They hesitate to discuss in the group discussion too.*

Similarly during the interview with students, I asked, do you ask unsolved problem to your friends? Do you also discuss in the group? Student replied

*There is no sharing environment between the friends about known and unknown ideas. We also do not discuss in the group.*

From the group discussion, I asked about the interaction between students, they replied

*Though we share some unknown things, do not share most of the unknown content.*

From the above presented opinions of the students and teachers, I concluded that the teacher felt challenge to maintain social justice in mathematics classroom due lack of interaction. Due to the less interaction and discussion between the students, it is clearly found that there is no sharing and helping environment with each other. However, the students learn best by sharing and interacting with others. So, the students become passive. Similarly, due to the lack of group discussion and mutual cooperation among friends students could not gain new ideas from the group. It showed that it was difficult to maintain the social justice in mathematics class.

**Unable to Link Mathematics with Practical Problem.** The way of teaching mathematics relating with the problems and uses in our daily life activities is the best technique to teach mathematics effectively. To make teaching effective and practical, mathematics teacher should link mathematics with our daily life activities and problems while teaching mathematics. And student also shows their interest in learning mathematics, to understand and remember it easily. Similarly, if we can link mathematics in our daily life we could solve our practical problems easily. In this context when I observed the classroom

*I found most of the teaching techniques were theoretical rather practical. I have not found the illustration made by the teacher about the use of mathematics in the student's life. I found the less use of teaching materials during the teaching.*

Similarly during the interview with teacher about the same topic the teacher replied

*Though some of the content can be linked in daily life but it is difficult to link most of the content. For this, it requires sufficient materials, infrastructure; which is almost impossible.*

I asked students, in which sector do you find the mathematics is used that you have learned yet? The students replied



*I have used mathematics to add, subtract, multiply and divide. We don't know the use of mathematics in other sectors very well.*

From focus group discussion, the students shared their views, *We don't know much more about the use of mathematics in our daily life. Teacher uses materials which make us quite easy to understand but we do not know the use of it in specific place.*

From the above information, I concluded that the teacher felt challenge to maintain social justice in mathematics classroom to link mathematics with daily life problems due to the limited time, lack of materials, infrastructure and so on. I also found that mathematics has been used in daily life activities by the students and teachers sometimes. But it is not enough. Also the student were not clearly aware about the uses of mathematics in their daily life so the mathematics teacher felt difficult to maintain social justice in mathematics classroom.

**Unable to Teach According to Students Mother Tongue/ Lack of Multilingual Teacher.** Mother tongue education refers to any form of schooling that makes use of the language or languages that children are most familiar with. This is usually the language that children speak at home with their family. The 'mother tongue' does not have to be the language spoken by mother rather it's the language they speak at first in their community or family. Children can and often speak more than one or even two languages at home. For example, they may speak one language (Newari) with their mother another (English) with their father and a third (Nepali) with their grandparents. In this context, from classroom observation I found that

*The teacher did not teach according to student's mother tongue because of the lack of multilingual education. He could not relate the topic according to the cultural activities and real life situation of the students during the teaching.*

*Students could not get involved among them from various cultural backgrounds because of monolingual teaching.*

In this context when I took interview with teacher and I asked "Do you teach the students according to their mother tongue? How do you maintain and address the cultural diversity in classroom? The teacher replied

*It is difficult to teach according to their mother tongue during the classroom teaching. Students from various cultural background study's here. They have different mother tongue and they represent different cultural society. So, it is a challenging job to make them understand to all of them at a same time.*

Similarly, in the same topic I asked with students and students replied

*Our mathematics teacher never teaches according to our mother language. The teacher does not link mathematics to our cultural activities. The teacher is not quite aware about our cultural diversity.*

Also from focus group discussion, students replied

*The teacher was not aware to maintain cultural diversity in our classroom. He does not use our mother tongue during the teaching.*

From above information, I concluded that the teacher felt a challenge to maintain social justice in mathematics classroom to teach according to student's mother tongue. It was found that the teacher did not teach according to student's mother tongue, because the students were from diverse communities and have diverse languages but a single teacher may not have the knowledge of those all students languages. Therefore, couldn't teach in multiple languages. He could not relate the topic according to the cultural activities during the teaching. There is an interrelation between student's culture and their learning process. So, if the student's culture and learning contents are interrelated then it facilitates learning and if the student's culture

and learning content are not matched then it hinders the learning process. It showed that the teacher could not teach according to their culture, behavior and mother tongue. The teacher could not address and reflect the cultural activities of students in mathematics classroom. In this regard, Acharya (2013) writes "The language other than mother tongue has created a challenge to the students who are from culturally different community. Nepali language used as a medium of instruction may have a barrier to understand the mathematics learning to non-Nepalese speaking students."

**Unable to Choose Appropriate Teaching Methods.** A teaching method comprises the principles and methods used by teachers to enable student learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn. In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity. In this regard, I did a classroom observation and I found

*The teacher did not use students centered teaching methods. Teacher mostly used lecture methods in mathematics teaching. It also seemed that the teacher taught about formula but did not give class work about this. There was lack of participatory approach of students and teacher.*

When I took an interview with students, the student replied

*The teacher does not teach according to students centered methods. Teacher mostly use lecture method in mathematics teaching. Our teacher evaluate us by giving classwork and homework.*

In this context, I also took an interview with teacher, the teacher replied

*I always think about my students and try to get new ideas for better teaching and learning. I generally use memorizing, problem solving and question answer methods for mathematics teaching. I ask question and sometime I let the students to do the problem on the white board. I ask students to memorize the students to use formula while they are working on the problems.*

From focus group discussion "*Our teacher use lecture method in mathematics teaching. We do not get enough time to practice in mathematics classroom*".

From above information, I concluded that the teacher felt a challenge to maintain social justice in mathematics classroom to choose appropriate teaching methods because the diverse abilities students desire diverse methods of teaching and understand differently. The methods used for medium students could not be fruitful and effective to other. So, the students need the methods according to their abilities but a single teacher may not use the methods according to the need of individual students because a teaching is formal and has limit time. Through this, it was clear that the teacher could not able to choose students centered teaching methods. The teacher was not aware about the teaching methods for appropriate context. In this regards, Shrestha (2016) found that "traditional teaching-learning methods and activities are the main challenges in mathematics teaching.

## **Chapter-V**

### **Findings, Conclusions and Implications**

This chapter deals with the findings, conclusions and implications of the study. After the rigorous analysis and interpretation of collected data, the findings of the study have been derived and conclusion is described from the result of interpretation of data. The chapter closes with implication of research. An implication of the study is given for the area where this study can be applied.

#### **Findings**

The main strategies used by mathematics teacher to promote the social justice in classroom were:

- ) The mathematics teacher provided equal opportunity for all students in teaching-learning process.
- ) Students were individually treated by the teachers in difficult situation during the mathematics teaching.
- ) If necessary, the teachers provide extra time for students with the help of school administration
- ) Teachers loved all the students during the mathematics teaching.
- ) The teachers motivated all students to learn and practice mathematics.
- ) Teaching materials were used by the mathematics teacher to promote the social justice in mathematics classroom
- ) Classrooms were managed very well by the mathematics teacher during the mathematics teaching
- ) The classrooms were made more inclusive by the mathematics teacher to promote the social justice in classroom.
- ) The mathematics teachers were always aware about child psychology during the mathematics teaching.

The main challenges faced by mathematics teachers to maintain the social justice in mathematics classrooms were:

- ) The mathematics teachers felt challenges to teach mathematics in the different mental abilities of students.
- ) Due to the limited time, the mathematics teachers felt challenges to promote social justice in mathematics classroom.
- ) Different family backgrounds of students was also the cause of difficulties in mathematics teaching and learning environment
- ) Students had not sufficient time at home to practice mathematics. The parents had to engage on their own works and parents could not get time to teach their children at home.
- ) The main challenge was the irregularity of students in the class. So the teacher could not get chance to check their homework and provide corrective feedback day by day which led them towards the better learning.
- ) The challenges of teaching mathematics were lack of interaction, co-operation, discussion between teacher and students and students and students.
- ) It was the challenge for the teacher to teach mathematics to link it with practical activities of students.
- ) There was a challenge to address the cultural diversity of students at the time of mathematics teaching inside the classroom.
- ) The teacher was unable to choose appropriate teaching methods according to students needs during mathematics teaching.

## **Conclusions**

In the context of Nepal, it is a challenge to maintain the social justice in mathematics classroom. To make effective classroom teaching, teacher has to use appropriate teaching methods, technique and teaching materials. The teacher must be aware about the diversity of the students. The mathematics teacher should be well trained to maintain the social justice in classroom. The teacher should give equal opportunity to the students who are from different family background and community. The teacher should engage the students and provide opportunities for the interaction and equal participation between all students.

In this sense, we can conclude that the strategies used by mathematics teacher to promote social justice in mathematics classroom are: providing equal opportunity for all students, treating individually for weak students, loving and motivating all students, well managing the classroom and making classroom inclusive. Also the reason of facing the challenges are: due to different cognitive level of students, due to boundary of time, different family background, lack of interaction, unable to link mathematics with daily life problem etc. We can say that the mathematics teacher should give continuous equal opportunity for all students, provide individual treatments for weak students especially and also for other, love and care all students equally, motivates all students, uses teaching materials, make classroom inclusive as usual. Also it shows that the teacher should conduct enough interaction, co-operation and discussion with students. Also the teacher should link mathematics with daily life problems. We can say that the teachers need more teaching materials and choose appropriate student centered method to teach mathematics and the school administration also should be aware about the students and teachers need as well as

must arrange the require teaching materials for the teachers and students. The teacher should respect and be aware about the different mental ability of students.

### **Implications**

Every research has implication in different sector. Following are the implication of this research for effective teaching-learning process inside the classroom

- ) This research is related with promoting social justice in mathematics classroom. So it is helpful for mathematics teacher, students, textbook writer, and curriculum planner to develop their professional field.
- ) It is helpful to every teacher to understand about social justice and to apply it inside mathematics classroom.
- ) To develop the curriculum being conscious about social justice.
- ) To know the strategies used my mathematics teacher to promote the social justice in classroom.
- ) To reduce and be aware about the challenges for maintaining social justice in mathematics classroom.
- ) Training program for the teacher; trained teacher are needed to improve the performance of students in different culture.
- ) Use of students centered teaching methods, teaching technique and activities
- ) Use of proper teaching materials
- ) To provide equal opportunity for all students, individual guide for weak students and love and motivates to all students which lead towards successful teaching and learning.
- ) For effective interaction, co-operation and discussion between students and students and teachers and students.



- ) Making teaching-learning effective
- ) The teacher can be culturally responsive to accommodate students from culturally and linguistically diverse classroom.
- ) School administration should help to make good environment for teacher and students for teaching-learning.
- ) Developing the friendly behavior between students and teacher
- ) To encourage parents to provide time enough time for study and help to make good environment for study in home.

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**Appendix-i**

**Interview Guidelines for Teacher**

I am Mr. Prakash Poudel, student of Tribhuvan University Department of Mathematics Education as an area of specification, Now I am carrying out research on 'Strategies used by mathematics teacher to promote the social justice in mathematic classroom' with special focus on secondary school from Kathmandu. I request you to cooperate by giving your response to the question below. I assure you for the confidentiality and won't misuse the information other than research purpose. Your cooperation in this regard will be appreciated and equally invaluable to complete this research

1. What are the strategies that can be used in mathematics teaching?
2. Do you address and treats the different kind of learners according to their need in mathematics classroom?
3. How do you give classwork and homework; equally or differently? How do you care them?
4. How is your relationship with the students? Do you behave all the students equally?
5. Do you provide extra time for students?
6. How do you behave with students? How do you encourage and motivate students towards learning?
7. Do you use essential teaching materials while teaching?
8. What kind of teaching materials do you often use?
9. How do you provide learning opportunity for girls? Students from different geographical region and marginalized group?
10. It is easy to address diversity in mathematics classroom?

## Strategies Used by Mathematics...

11. How do you manage your classroom?
12. What kind of challenges do you often face in classroom teaching?
13. Does your school administration provide enough time for mathematics teaching?
14. Do you teach the students according to their mother tongue?
15. What is the role of teacher to manage gender-friendly classroom?
16. It is easy to link mathematics with daily life problems?

**Appendix-ii**

**Interview Guidelines for Students**

1. Do you think that your teacher behaves you equally with respect to other students?
2. Does your teacher give same homework and classwork to the students in your class?
3. Does your teacher help you individually? If so, when? Does your teacher gives extra time for teaching and learning?
4. Does your teacher love and care you? How does the teacher inspire you to practice mathematics?
5. How does your teacher manage your sit? Do you see white board clearly? Do you listen the voice of teacher?
6. Does your teacher use teaching materials? Provide extra time for you?
7. How often do you participate in group or question answer?
8. How much your parents support in your study?

**Appendix-iii**

**Interview Guideline for Focus Group Discussion**

1. Does your teacher help you individually?
2. Does your teacher give extra time for teaching?
3. How does your teacher manage your classroom?
4. How does the teacher inspire you to practice mathematics?
5. Does your teacher care and love all of you?
6. How does the teacher behave all of you?
7. Do you involve in classroom participations and discussion?
8. Do you ask questions with your teacher?
9. Does your teacher use teaching materials?



Strategies Used by Mathematics...

**Appendix-iv**

**Observation Form**

Observer Name..... Date of Observation..... Observed

Time.....

Name of Observed College..... Period.....

Items	Qualitative Information (Thick Description)
<b>Opportunity for students</b>	
The teacher gave equal chance for all students	
The teacher equally treats each and every students	
Ask question individually and help individually	
Give homework and classwork	
<b>Teacher behave towards students</b>	
Teacher loves and cares students	
Teacher motivates for students	
A teacher address students by name	
What kinds of language does the teacher used	
Behave with students having different gender, geographical region, culture and different mental ability	
<b>Teaching materials</b>	
The teacher use instructional materials while teaching mathematics	

## Strategies Used by Mathematics...

What types of materials the teacher use?	
The text books are only materials provided to students	
<b>Teacher support and help</b>	
When the students are solving math problems, the teacher moves around the classroom to provide support and scaffolding	
teacher provides additional time for students	
Individual help	
<b>Classroom management</b>	
Students desks and bench (sitting management)	
Time management	
Uses of White board and teaching materials	
Teachers voice, writing	
<b>Classroom condition</b>	
Sanitation of classroom, light, air condition ect.	
Decoration of classroom	
Students number and classroom size	
<b>Interaction</b>	
Classroom discuss, question answer process	
Classroom presentation	
<b>Languages</b>	
Communication with both Nepali and mother tongue	
Only Nepali language	
Only mother tongue language	