

Chapter-I

Introduction

Background of the Study

Mathematics is the subject that is most usable subject in our daily life. The development of mathematics coincided with the development of human civilization. “Mathematics is used throughout the world as an essential tool in many tools in many fields, including natural science, engineering, medicine and the social sciences”(Burner,1983).

Nepal is a multicultural country with a various ethnic groups and castes. People are not perfect in one common language. So, their children spoke own mother tongue. Pupils enroll into the school from different cultural background with their ethnicity and voices. This type of discrimination directly affects towards mathematics learning. Nepal is multi-cultural country where the multiple language and ethnical groups reside. There are 61 ethnic groups and 125 languages in the country which invites the multi- cultural nature of culture (Upadhaya, 2067p.305).

Strategy means a grand schedule or master plan of action to achieve sustainable objectives in a particular field. As far as educational field, strategy concerned with the methods and styles followed by the teachers towards motivating students, learning styles of students and learning process of students. Instructional strategies are techniques use to help students became independent, strategic learners (Bhatta, 2012).

Equity means giving opportunity for students as per their need and essence. It is the process of establishing equality among students from different cultural background. In a class, students come from various socio-cultural backgrounds. So, one teacher should deal with his/her students according to their understanding levels.

The organization for Economic Co-operation and Development (OECD) define about equity as the setting a basic minimum standard for education that is shared by all students regardless of background, personal characteristics, or location.

In order to probe into the above mentioned issue, I am motivated to carry out this research on the topic “Strategies to promote equity in socio-culturally diverse Mathematics classroom”.

Statement of Problem

According to national census 2011, there are 125 castes and 123 languages, varieties in costumes and rituals. Student come school from different socio-cultural background. So, similar diversity exists in school. That makes cultural diversity in school and inside the classrooms. Administrative team and the teacher should be carefully about the needs, interests, choices, voices, economic backgrounds, family environments and understanding level of students. In my view, in order to manage this type of diversity inside the school and among the classrooms, the teacher should follow the principle of equity.

Applying equity principle and to promoting equity in culturally diverse mathematics classroom may not be easy task for those who are fresher in the field of teaching. Limited numbers of researches and observations had been carried out in relation to promoting equity in culturally diverse classroom. And they rarely advocate about the way of promoting equity. Therefore, this study becomes milestone to identify the ways to be followed by teacher to promote equity in their classroom and explore the ways for making equity in culturally diverse classroom. Research questions are the breaking part of objectives of the study. To carry out the research, following questions have been taken:

-) Why teachers do face obstacles while managing equity in socio-culturally diverse mathematics classroom?
-) How and what strategies do adopt mathematics teachers for 'promoting equity' in socio-culturally diverse classroom?

Objectives of the Study

Objectives of the study were,

-) To find out the problems faced by teacher while managing equity in socio-culturally diverse mathematics classroom.
-) To explore the strategies used by teacher for the promotion of equity in socio-culturally diverse mathematics classroom.

Significance of the Study

This study is based on how secondary level mathematics teachers are managing classroom by using 'equity approach' and what type of strategies are followed by the teachers to promote equity inside the classroom.

-) It helps the teachers and the facilitators for the strategic management and mobilization of the classroom.
-) It encourages the teachers to use innovative strategies while trying to promote equity inside the classroom.
-) It equally supports the policy designer to design policy on the basis of equity approach.
-) This study provides the guideline to identify different factors which influence in learning mathematics.
-) This study enables to manage classroom as an inclusive approach.
-) It offers the systematic ways to discourage discrimination among students in classroom activities.

Delimitation of the Study

No one study is free from limitation. This study is delimited into “Strategies to promote equity in socio-culturally diverse mathematics classroom.” The delimitations of the study were pointed out below:

-) The research design has been qualitative perspectives.
-) The area of this research was delimited to Kirtipur, Kathmandu.
-) Only the two teachers, two educators and 4 students from class seven and 4 students from class nine were selected as sample for semi-structured interview who were teaching and studying mathematics in Mangal Higher Secondary School.
-) The participants were selected purposively and data were gathered only from classroom observation, document analysis and semi-structured interview with selected sample teachers, educators and students.

Definition of Key Terms

Equity. Positive discrimination to make equality in socio-culturally perspectives.

Cultural diversity. Cultural diversity is the existence of different culture just likes: ethnic groups, caste, and religion among the society.

Students. Students referred are secondary level students of government school coming from different diversity, ethnic-group, cultural and society.

Socio-culturally diverse classroom. A class where the students are participant from various culture and society.

Teaching Strategy. In instructional manner, teaching strategy refers to the types of teaching methods being used by the teachers.

Chapter-II

Review of Related Literature

The review of related literature helps the researcher to find out the area of the problem and the gap which leads the researcher to find out the knowledge or ideas that haven't been existed before by others. A literature review is a "comprehensive study and interpretation of literature that addresses a specific topic" (Aveyard, 2010). 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.

Review of Empirical Literature

Acharya (2017) conducted an international journal "Strategies for Making Mathematics Classroom Discourse Student Friendly: An Intercultural perspective." The main objective of the article was to investigate existing mathematics classroom discourse in basic level students and explore the ways for making classroom discourse students' friendly from intercultural perspective. The research design was qualitative with case study approach. The main tools of the study were classroom observation and interview guidelines. The data have been analyzed by connecting theories. From this study, the findings of the study were existing classroom discourse in mathematics classes that focuses on elaborative and recapitulation phases and also concluded that though culturally-based pedagogy, using different strategies in teaching-learning mathematics in the classroom, by replication of communities of practice in the classroom, avoiding rote memorization, by implementing co-operative learning, through sharing with acculturation and enculturation, through multiple representations making classroom discourse students' culture friendly.

Shrestha (2016) carried out his study entitled “Cultural Diversity and Difficulty in Learning Mathematics.” The main purpose of the study was to identify the difficulties in learning mathematics of culturally diverse students at school and explore the relationship between culture and learning mathematics. The researcher raised questionnaire for both teachers and students. Selection of the research design was qualitative and ethnography approach. Observations with in-depth interview and documents analysis were the research tools of the study. The researcher concluded that there was a mutual relation between culture and learning mathematics, pupils’ weak perception on mathematics, lack of culture friendly curricular materials, mathematics anxiety, traditional teaching learning activities, socioeconomic status of family, and discrimination in classroom and home-school mismatch were the difficulties in learning mathematics of culturally diverse students at school. The researcher had also found that mathematics teaching and learning ways from the schooling was not good. Existing school mathematics teaching learning practices seem to have been failing to address social and cultural needs of the students.

Wagle (2017) conducted the research study entitled “Classroom discourse in mathematics: A multicultural perspective.” She used questionnaire for teacher and students. Such as how are existing teaching strategies in classroom discourse from multicultural perspectives? And how are existing teaching strategies in classroom discourse as students friendly? She was used qualitative research design with case study approach. In this research, altogether 8 persons were involved according to purposive sampling techniques. Classroom observation form and interview guideline were the main tools of this study. She uses different theories to produce the information and draw conclusion on the study.

From the analysis of the data, she has found that theoretically teachers were well known about to preparation of lesson plan but practically teachers were unable to practice in actually classroom teaching. She has also concluded that for making classroom discourse students friendly through: culturally based pedagogy, by using different strategies in teaching-learning mathematics in the classroom, by replication of communities of practice in the classroom, by avoiding rote memorization, by implementing co-operative learning.

Upretee (2006) has carried out a case study research on “Classroom management from multicultural perspective.” The objective of his study has to find out the knowledge about multicultural perspective and to find out the actual situation of mathematical classroom management from multicultural perspective. This study was limited to the school with students from diverse cultural background in Kavrepalanchok district. The selected respondents were primary level students, head teacher and other teachers. They use different ways like observation from interview, guidance and school documents. This research was interpreted by using qualitative method. The major findings were teacher beliefs and understanding of multiculturalism directly affected the classroom and there were multiculturalism and its effect on the classroom. The level of understanding of multiculturalism was higher in Brahmins and Chhetris in comparison to Newars.

Kubat (2018) conducted his study entitle “Identifying the Individual Differences among Students during Learning and Teaching Process by Science Teachers.” The main purpose of the study was to determine what science teachers are doing to bring out the individual differences of students during the learning-teaching process. He raised research questions like; what are the individual differences in students? What are science teachers doing to determine the individual differences of

students? What do science teacher do in their lessons to design a learning-teaching process appropriate to the individual differences of students? What are the suggestions of science teachers to support individual differences of students? He had been chosen qualitative research method and case is designed according to phenomenology. Semi-structured interviews were the research tools of the study.

He concluded that, individual differences are important for determining the learning styles of students; students identify their individual differences with the help of test, homework and activities during the teaching and learning process. He also concluded that, in order to design the learning-teaching process appropriate to the individual differences of the learners, the learners would make active participation in the lesson and the individual differences could be supported by increasing the experiment and school trips.

Acharya (2015) addressed out the Ph.D on the topic, Relevance of Primary Level Mathematics Education in Nepal: A Cultural Perspectives. In this study enrolled the research questions: To what extent are the existing primary school mathematics curricular materials students' cultures friendly? How are the pedagogy used by the teacher in multicultural classroom culturally relevant? What challenges/problems are faced by teachers and students while teaching-learning mathematical in the multicultural classroom. What vision do mathematics educators, mathematics teachers, educated cultural group people and curriculum planners have for making primary mathematics education culturally relevant? To carry out the solution of these questions, he used ethnographic methodology under interpretive paradigm to explore the multiple realities through the method of observation, documents analysis and in an interactive dialectical manner. The data have been

analyzed using a sequential process of transcribing, coding, categorizing and thematizing.

He found that contents of primary level mathematics curriculum which are related to daily useable problems of human life gap between the practices and theory of to some extent. Likewise, the medium of instruction was the key challenges in multicultural classroom teaching learning process. He concluded that, the application of fallibility approach rather than absolutistic one in teaching learning activities, mother tongue based primary education, incorporation of local mathematical knowledge in the curriculum; culture friendly pedagogy and continuous assessment system are the major approaches to make mathematics education culturally relevant in primary level.

Theoretical Review

I have reviewed almost dozens of theory according to my research. Here, I have point out the selected theories which are favor with my research they are:

Vygotsky's Socio-cultural Theory. According to socio-cultural theory, knowledge is the best constructed when learners collaborate together. Students supports one another and encourages new ways to form, construct and reflect on new materials. Social interactions and participations of group members play a key role in developing knowledge. Vygotsky believed that parents, relatives, peers and society all have an important role in forming higher level of functioning.

Vygotsky's socio-cultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture. The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition. Vygotsky believed everything is learned on two levels.

First, through interaction with others, and then integrated into the individual's mental structure, every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals. (Vygotsky, 1978) A second aspect of Vygotsky's theory is the idea that the potential for cognitive development is limited to a "zone of proximal development" (ZPD). A teacher or more experienced peer is able to provide the learner with "scaffolding" to support the student's evolving understanding of knowledge domains or development of complex skills. Collaborative learning, discourse, modeling, and scaffolding are strategies for supporting the intellectual knowledge and skills of learners and facilitating intentional learning. Vygotsky's Zone of Proximal Development "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance."

Adam's Equity Theory. It is based in the ideas that individuals are motivated by fairness. It focuses on determining whether the distribution of resources is fair to both relational partners. Equity is measured by comparing the ratio of contributions and benefits for each person. Adam's asserted that employees seek to maintain equity between the inputs that they bring to a job and the outcomes that they receive from it against the perceived inputs and outcomes of others. Equity theory plays motivational role in an organization, which enables individuals to compare their jobs inputs and outcomes with those of others and then respond so as to eliminate any inequities.

About equity theory in educational implications, Msoroka mentioned on his seminar paper, an individual will consider that he/she is treated fairly if he perceives

the ratio of his inputs to his outcomes is equivalent to those around him/her. Thus, all else being equal, it would be acceptable for a more senior colleague to receive higher compensation, since the value of his/her experience (an input) is higher.

The way people (teachers) base their experience with satisfaction for their job is to make comparisons with themselves to the people (teachers) they work with. If an employee (teacher) notices that another person (teacher) is getting more recognition and rewards for his/her contributions, even when both have done the same amount and quality of work, it would persuade the employee (teacher) to be dissatisfied. The idea of equity theory is to have the (outcomes) rewards be directly related with the (inputs) quality and quantity of the employee's contributions (Walster, Traupmann & Walster, 1978; cited in Msoroka, 2010).

Bourdieu's Theory of Cultural Reproduction. This theory foster that the main role of education system of schooling in cultural and social reproduction of the culture of the dominant classes. He addressed that school holds the cultural capital of controlling class and transmits it unevenly to children.

Bourdieu (1977) declared that cultural capital through education can be converted into health and power. Those students who are from the middle class then school is adopting their culture. So, the children from upper classes take more benefit out of school than lower class counterparts. The skills and knowledge which is transmitted in the classroom, is alien to the lower class children and hence, they usually fail. In other words, the achievement of the students responds to the cultural capital of the students, the rich have different cultural capital than the poor students. Working class and the poor children lack favorable situation and appropriate cultural capital. Therefore, they fail in examination and never enter higher education. Thus, social inequalities one reproduced and legitimated.

The main reason for under achievement of working class children are the education system because it reproduced the culture of dominates class, which is based. This is way of children from the working class and their income poor do not understand more and learns specific skills. On the other hand, the school environment is comfortable for the middle class parents depend on the teacher to educate their children whereas lower class parents do not supervise and monitor educational progress of their children .It is also a part of culture.

For parental background to engage in the social reproduction process via cultural capital, parental cultural capital need to be transmitted inter –generationally. But the requires four conditions; first, a strong association between parental and pupil’s cultural capital must exist. Second, the cultural capital must persist over time. Third, parental cultural capital must exert significant effects, after controlling for other back ground factors, on an offspring’s initial occupational achievement. Finally the effect of parental social class on offspring’s occupation must be significantly mediated by offspring’s culture capital .For transmission translate itself into stratified educational outcomes. We need to know whether the effect of parental culture capital persist significantly on the offspring’s educational outcomes before that offspring enters the labor force (Tzanakis, 2011).

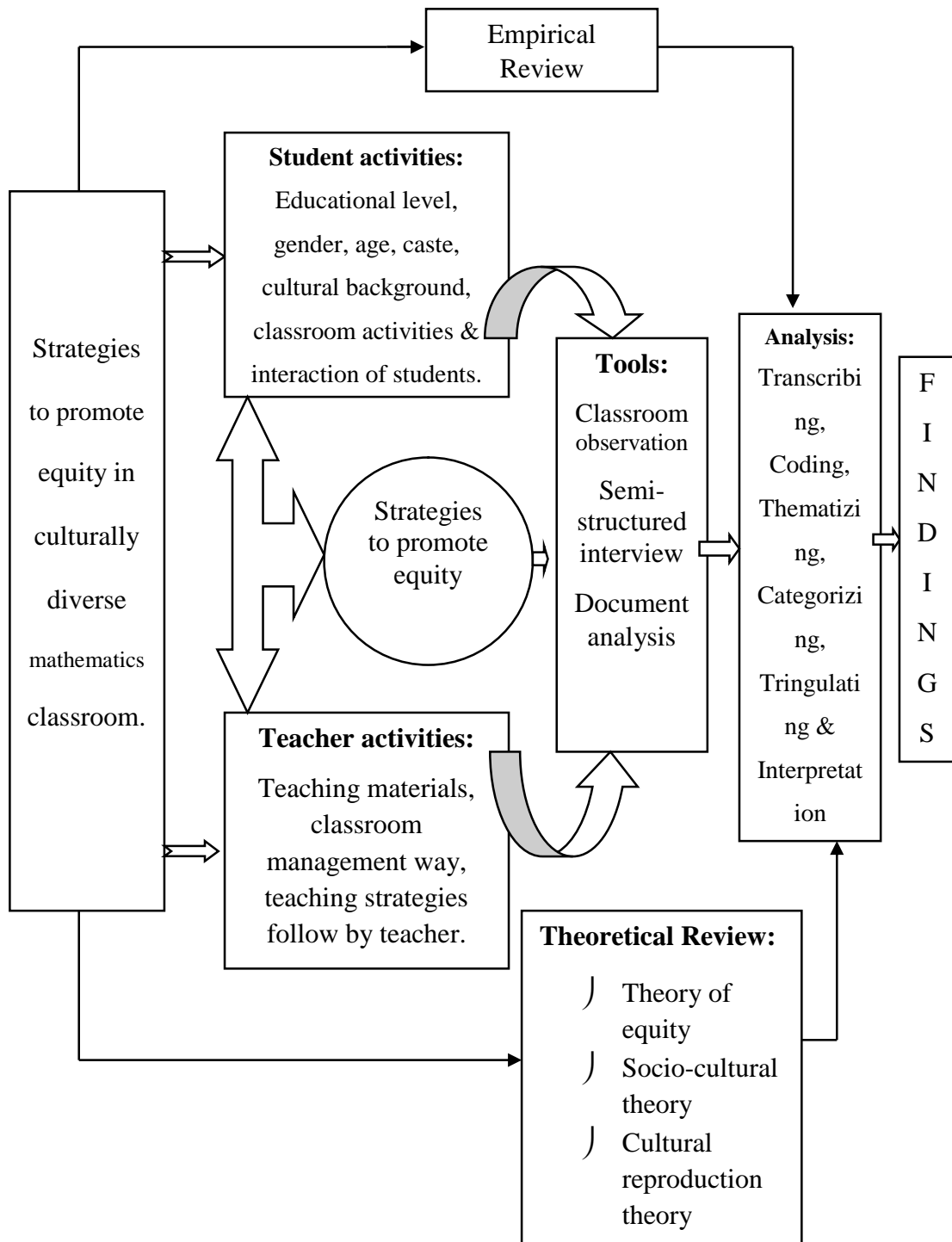
Filling the Gap

A few research works have been carried out related to the promotion of equity in classroom. I have found some books, articles, and previous research studies related to the equity. However, they have not discussed about the management of equity and the way for promotion of equity. They have also not mentioned how teachers should follow strategy to promote equity in culturally diverse classroom. Thus, to fulfill this gab I am motivated to study on “Strategies to promote equity in socio-culturally

diverse mathematics classroom." So, I believe my title for this dissertation would be milestone for carried out a research.

Conceptual Framework

To make conceptual framework, there is no hard and fast rule. It can be developed on the basis of research problem, objectives and questions. Conceptual framework provides better guideline for readers to see the research approach shortly from flow chart or diagram.



In the above figure, horizontally I conducted class observations to examine teachers' and students' activities. I observed students activities in classroom on the basis of educational level, gender, age, caste, socio- cultural background, classroom activities and participation of students. Likewise, I also observed teachers activities in same manners as students on the basis of teaching materials used by teachers from the

equity perspectives, classroom management methods, teaching strategies followed by teacher.

To see the problems faced by teachers while maintaining equity and strategies for 'promotion of equity', classroom observation, semi-structured interview and document analysis were the research tools. The random data were properly analyzed by transcribing, coding, thematizing, categorization, triangulation for analysis and interpretation. Possible organized data were combined with empirical review as well as theory of equity, socio-cultural theory, and cultural reproduction theory. Finally, I came up with the findings of dissertation.

Chapter-III

Methods and Procedures

This chapter describes in details about the methods and procedures of the study.

The methods and procedures adopted in this research have been listed below.

Research Design

Research design can be defined as an overall framework of methods and techniques chosen by a researcher to organize different aspects of research. It provides insights about how to conduct research using a particular methodology.

For the research study, the popular research designs are qualitative design, quantitative design and mixed design. In this study, I have followed qualitative design with ethnography approach. The qualitative design is descriptive and exploratory in nature, (Acharya, 2015). Qualitative research is involving detailed verbal deceptions of characteristics case “people or systems obtained by interacting with interviewing and observing the subject (Denzin & Lincoln, 2000).

In qualitative research design, ethnography is the essential type to grab the needed inquiry from the natural process. It helps to cultural world of the research from their perspectives (Shrestha, 2016). Ethnography intends to capture detailed and in-depth description of everyday life practice of people (Holey, 2014; as cited in Rai, 2015).

Study Area

Equity is mostly affected by various cultures, ethnics, caste, gender, language, geographical backgrounds. That’s why, to study about strategies to promote equity in socio-culturally diverse mathematics classrooms I have decided to take data from Shree Mangal Higher Secondary School Kirtipur, Kathmandu. The reason behind

choosing this study area and school is because many students belonging to different districts with various socio-cultural backgrounds come to study here.

Participants of the Study

Qualitative research design was followed to carry out the study. So, the sample size in this study is not fixed. According to Anderson there will not be rules for sample size in qualitative inquiry (Anderson 2001, p. 123; cited in Adhikari, 2007). However, I have taken all about my study and I proposed my research proposal with head teacher and mathematics subject teacher in that school. After getting permission from teacher, the researcher observed class 7 and 9 while teaching. Then participants of the study were 2 mathematics teachers, 2 boy students and 2 girl students from grade 7 and 2 boy students and 2 girl students from grade 9 as well as 2 mathematics educators. Altogether, 12 participants enrolled for semi-structured interview.

I used purposive sampling to select the participants for my study. In purposive sampling one picks up the case that are judged as typical on the basis of the needs of researcher (Thakur, 1997 cited in Khanal, 2015).

Research Tools

Creswell (2007) visualized data collection as a series of interrelated activities aimed at gathering good information to answer emerging research questions. Research tools are the basic instruments to gather data, to seek possible solutions for observed problems (Wikipedia). In order to answer above mentioned research questions, the research tools of the study were classrooms observation form, semi-structured interview, document analysis and cell phone for voice record. The researcher observed the behavior and activities closely with respondents in a natural setting as much as possible in order to collect essential data.

Data Collection Procedures

In this study the data collection starts with the help of above mentioned tools. The researcher observed teaching-learning activities in grade 7 and 9. I also observed about the teachers' activities while teaching mathematics. Then from the selected participants I conducted semi-structured interviews with teacher and students. At that time, I observed carefully, I recorded interview and I noted down essential information from each and every notable activity of students and teachers through the observation.

Data Analysis and Interpretation

After completing above mentioned procedures, I transcribed all interviews. The data were organized into particular headings for detailed analysis. According to Creswell (2007) data analyze in qualitative research consists of preparing and organizing the data, analysis the data then reducing the data into theme through process of coding.

In my analysis after transcribition, I coded on the basis of respondents and types of strategies. Then, the data was categorized and the theme was discovered from observation and compared the data. After comparison and categorization of data, I followed triangulation approach to analyze and interpret data. This finding was compare with the help of reviewed literature as above.

Quality Standard

After completing the formation of the research tools, we need to maintain quality standard of the research. For maintaining the quality standard in qualitative research Guba and Lincoln (1998) suggests four criteria which are: credibility, transferability, dependability, conformability. So, I followed to make 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 have spend more time for interview, two weeks for classroom observation. I also gave special focus on document analysis.

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 voice recorded while taking interview from participants.

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 deals about the summary part of the scatter data. The word ‘analysis’ means breaking of whole into meaningful parts/ components (Sharma, 2011, p. 61). In my study, classroom observation, semi-structured interview, documents review and focus group discussion were the tools. During the study, I have conducted classroom observation while teaching class 7 and 9. I closely observed the teacher’s and students’ activities.

Objectives of this study were to find out the problems faced by teacher while managing equity in culturally diverse mathematics classroom and explore the strategies used by teacher for promoting equity in culturally diverse mathematics classroom. Likewise, the research questions of this study were why teachers need to face obstacles while managing equity in culturally diverse mathematics classroom? How mathematics teachers do used strategies for promoting equity in culturally diverse classroom? This study is mainly based on analyze, interpretation and discussed about the teachers’ teaching styles, activities and strategies. In this regards, I have transcribed all data from semi-structured interview which were taken from the students and teachers. From this tentative data, I have pointed out following themes for both section I and II.

Section I: Problems Faced by Teacher While Managing Equity in Socio-culturally Diverse Mathematics Classroom.

Here, problems face indicate that teachers should teach in classroom by treating equally to all students. However, there might be many challenging for teachers to provide equal access. Here, I am going to carry out what types of problems, challenges are faced by teachers to teach mathematics? How do they solve

the problems of students? How they arrange mathematics classes by addressing students' diversity? In this concern, to fulfill these objectives I have conducted class observations and interviews with educators, teachers and students. From these tools, I have derived following themes:

Low Achievement against the Curriculum Standard. Learning is based on students' interests, choices, age and understanding level. Curriculum fosters the content sequentially from simple to complex. Meanwhile, student should achieve grade wise goals and objectives of curriculum. Students enroll in classrooms with individual differences, even if they are twins. Some students are god-gifted and some slow-minded are enrolled in class. Like this, diverse classroom teachers need to teach mathematics on the basis of equity approach. However, it is hard for teacher to follow equity in such type of classroom. On the time of class observation while teaching, I have found following scenario,

Student's presents are differencing in their performance. Some students are able to understand when teacher provides guideline and some are not able to even at the end teacher's discussion. Although, these students asking again and again until giving all solutions.

In the interview of teacher, I had asked a question, from equity approach: what type of problems have you faced while teaching mathematics? The teacher replied that,

Students come from different background to study here, some from government school background and some are private school background. So, they make diversity in classroom. Main problem which I am facing in this case is some of students are very weak according to grade wise curriculum standard. That is why, they needs to be taught pre required contents that of 6,

7 and 8 even in class 9 for those who are comparatively weak according to grade wise curriculum standard.

Reflected in the national standards are the recognition that all students, including those who are weak in classrooms and disabilities, can learn mathematics, and that students may vary in how they learn best. For students to be successful in mathematics, teachers need to offer them appropriate opportunities to learn. Offering identical instruction to every student no longer is sufficient for teachers to help every student attain standard based learning outcome. To date, however, the promise of standards based reform has not been readily fulfilled (Reed, 2017).

From the above responses, it can be concluded that students previous level of knowledge in contents directly affects for teacher in teaching.

Cause behind Cultural Diversity in Classroom. Cultural diversity indicates various culture or ethnic groups in a society and culture. Student come school from the different socio-cultural background. So, same type of simultaneous condition appears in school. That forms cultural diversity in school and inside the classrooms. The discrimination resulted from such diversity directly affects towards mathematics learning. School is a miniature of society (Dewey, 1915). So, we can find similar environment in school as it remains in society. In the time of class observation,

Students come in school from different background of society. They are seating in bench according their castes. They are talking with friends by using their mothertonge languages but teacher is teaching mathematics by using English and Nepali language. There are linguistic limitations for teacher to address all students at once.

In the same context, Acharya claimed that the medium of instruction was found to be key challenges in multicultural classroom teaching learning process (Acharya, 2015).

In the interview of teacher, I had asked a question in equity approach: how does diversity affect in teaching? The teacher replied that,

In our school around 6/7 different culturally backgrounds students have come to study. When I enter classroom and teach the related lesson then I have given class work for all students. Some students are able to solve and some are not. Those students who are not able to solve given problems are found to be weak in mathematics learning. The main reason is that they are from various ethnic, cultures, linguistic and religious groups. They have not got well family environment at home as well as from their society and also they are weak in socio-economic status which makes diversity inside the classrooms. It is a challenge for teachers to treat all students individually as per their base.

Although students are different in their mathematical performance, teacher needs to solve their obstacles individually. Teachers need to understand what count as knowledge in mathematics as well as how knowledge maybe related to norms, values of diverse language and cultures (Acharya, 2013).

Inadequate Time for Mathematics Teaching. Mathematics is a subject that should be taught by connecting daily usable works. Mathematical contents take more time while teaching. Curriculum developers and designers should be careful about the contents which are incorporated in level-wise standard. Like which contents consume how many times to teach all included content? It makes easier for teacher to complete full course on time. Administrative team should also be careful about the length of course of mathematics while making specification chart by addressing students' performance in each subject. It can be helpful to maintain equity for all students according to their difficulties in learning mathematics.

During classroom observation, teacher give class work and some talent student finish it without help of the teacher. He has focused every student from first bench to last bench. He asked all students about this numerical individually each students. Those who are late to solve this problem, they raise their individual problems before teacher and teacher has individually treated them. It is the good way for all students. However, it affects for teacher to complete all mentioned course on time.

From the interview of teacher, I raised questions is 40 minutes time (per day) sufficient for addressing all students individually? How do you treat them? The teacher has replied,

Obviously, this time is not sufficient to treat all students according to their needs. Mathematics subject comparatively takes more time than other subjects according to nature of course. Sometimes one short question takes full period to deliver all students. Due to inadequate time to complete full course on time, I should need to jump on course by giving similar pattern question for students as homework and practice.

Likewise, I asked questions for students, is teacher giving you time to address your individual problems? If how and when?" students respond regarding that,

Teacher provides time according to content. He does not give much time as individually rather he gives time to solve different pattern questions and he asks to copy from white board. Sometimes teacher give class work and he gives individual feedback about our weakness. Teacher does not give more time to ask our problem and he claims that we should finish our course on time.

From the above responses of teachers and students, it can be concluded that mathematics takes more time for teaching. Per day only 40 minutes time is not sufficient to provide good quality of teaching by addressing individual difference as the socio-cultural perspectives of equity.

Lack of Socio-economic Background and Parents Responsibility. Parents are the first teachers and home is the first school of every child. Parents' behavior plays vital role in their pupils learning. In this regards, I have asked a question for teacher, what about the responses of parents towards their children in learning mathematics? Do they consult with you and how? In these questions, teachers answered that,

We conduct regular terminal exams as well as unit test and weekly tests then we provide the result with their answer sheets along with feedback about pupil's weakness. In that time, some parents are very responsible towards their children's marks and they consult with us. Those parents who are from strong economic background are responsible about their children's learning; these students are good in their position and their mathematical level-wise achievement. Some parents become absent in result time of students, their children are comparatively weak in performance in mathematics learning.

According to Bourdieu's cultural reproduction theory, cultural capital through education can be converted into health and power. Those students who are from the middle class then school are adopting their culture. So, the children from upper classes take more benefit out of school than lower class counterparts. In this context teacher also argued that,

Lack of socio-economic background and parents' responsibility makes problems for teacher to address equity because we conduct extra classes for

those students who have weak performance in formative evaluation. But in this extra class these weak students are not participants because the poor responsibility of parents, weak socio-economic status and lack of proper family environment which directly affects in students learning.

In this regards, Shrestha argued that, there is a mutual relation between culture and learning mathematics, pupils' weak perception on mathematics, lack of culture friendly curricular materials, mathematics anxiety, traditional teaching learning activities, socioeconomic status of family, and discrimination in classroom and home-school mismatch were the difficulties in learning mathematics of culturally diverse students at school (Shrestha, 2016).

From the above responses of teachers, it can be claimed that the role of parents, socio-economic status of family create the problems to manage equity in classroom while teaching mathematics.

Poor Administrative Co-ordination. Administrative teams care all about activities around the school. As per the equity principle, it can manage extra class for socio-culturally disadvantages students. In this regards, I have asked a question for teacher, how does administrative teams help to your teaching? Is an administrative team responsible for all weak students? In these questions, teachers replied that,

Administrative team is no more responsible for all teachers because I request for extra class for difficult subjects according to student performance. As I am mathematics teacher, for teaching Mathematics from the perspectives of equity, it is not sufficient time according to administrative management.

Administrative should conduct extra class for teaching Mathematics in every month which can be favorable for all students and can be addressed equity in mathematics learning. But, the problem here is administrative teams no more

create any opportunities for hard worker teachers. According to nature of course of mathematics it takes more time. However, we get rewards equally without evaluation of time which we were spending there in teaching.

In this regards, Adam's Equity Theory of educational implications which (Mosrikra, 2010) mentioned in his seminar paper verified with above responses of teacher that is the way people (teachers) base their experience with satisfaction for their job is to make comparisons with themselves to the people (teachers) they work with. If an employee (teacher) notices that another person (teacher) is getting more recognition and rewards for his/her contributions, even when both have done the same amount and quality of work, it would persuade the employee (teacher) to be dissatisfied.

From the above responses, administrative team should be responsible towards teacher's problems. Administrative team should coordinate with all staff for addressing the students' difficulties and problems.

Less Participation of Students. Teaching learning activities depend on students' responses towards teaching. Without students responses teacher cannot take effective strategies for teaching. Students should ask their problems with teacher without any hesitation and feeling of fear. Teacher should provide motivation for students in their practices and feedback for the correction of their mistakes.

Meanwhile, I have conducted class observations and in this concern I got following responses,

Back benchers students are being passive towards teaching. They are only busy in copying the teachers note from whiteboard. Otherwise, they are engaged on gossiping with each another rather than asking own problems with teacher. I also focus on them while observing class. They are not able to

do numerical given by teacher as a class work. Teacher has given attention towards these students even they are not responsible with teacher.

In this context, in the interview with students I have asked questions, how do you take mathematics class? Is it boring? Do you ask your confusion with teacher while teaching? Student replied that,

Mathematics is boring subject for me because I never take pass marks in this subject. It is difficult subjects for me; I do not give any time for studying mathematics in home. I just copy note from my friends' note; to attempt homework without any understanding. I feel that if removed Mathematics and Science subjects from school course it will be better for me because my hobby is to become good cricketer from Nepal. I do not raise any question to teacher about my confusion rather I ask with my friends. While I remain in class I think it will be better for me if teacher do not ask any question. I became nervous with mathematics teacher.

In this regards, (Beilock & Willingham, 2014) argued that; students with a high degree of math anxiety perform worse in math from elementary school through college, relative to their less math anxious counterparts.

I have also asked a question for teacher, how are students participating in your teaching time? How do you behave them? In these questions, teachers replied that,

I want to make my teaching strategies is more interactive and democratic. I have given opportunity for students according to their level of understanding. But the problem is here that is, I mainly focus for comparatively weak students those who have weak performance in formative test; but they are not interested to involve in learning. They are also not given proper time for study mathematics at home and not raised any question for teacher while confused. I

cannot be able to treat them properly due to their less interaction while teaching.

From the above responses, it can be concluded that to organize better teaching student need to engage in interaction with teacher while teaching. It helps for teacher to identify students' obstacles. Then, teacher can decide teaching strategy for comparatively weak students in classroom which foster equity in teaching mathematics.

Lack of Culture Friendly Curriculum. Curriculum should address the social, cultural needs and values. Students are interested to learn daily usable contents. If students know the practical fields of content then they are motivated to learning mathematics. In this regards, I asked question for teacher, is mathematics curriculum favorable to our socio-cultural needs? Teacher replied that,

All contents included in curriculum of mathematics are not favorable according to our socio-culture situations but some contents are very useful in our daily life. All contents mentioned in curriculum might have practical aspects in some specific field but we cannot claim every content to be equally piratical. However, I have given real life examples while teaching these types of contents as much as I can. Though, curriculum addressed all contents that are directly useful in our daily life problems and related with our socio-cultural context that can make it easy to learn for all students. That can support to maintain equity approach in teaching.

I have asked questions for students, what types of content should be included in mathematics subjects to make it more cultural friendly? Student replied that,

We don't know the application field of all mentioned contents except arithmetic mainly. All mathematics content should be contextual with our society. International standard content is not necessity to enroll in our syllabus.

In this regards, Shrestha claimed that mathematics teaching and learning ways from the schooling was not good. Existing school mathematics teaching learning practices seem failing to address social and cultural needs of the students (Shrestha, 2016).

From these responses, it can be concluded that curriculum should be cultural-friendly which can address every norms, values and needs of society.

Section II: Strategies Used by Teacher to Promote Equity in Socio-culturally Diverse Mathematics Classroom.

Here, in instructional manner strategy indicates what types of methods are used by teachers to teach mathematics? How do they solve the problems of students? How do they arrange mathematics classes by addressing students' diversity? In another words, instructional strategies are techniques that are used by teacher to take attention of students towards his/her teaching for creative learning. To fulfill this objective, I have conducted class observation, semi-structured interview with mathematics educators, teachers and students. From these tools, I have derived following themes:

Addressing Individual Difference. Students are not able to grab all contents equally. Each student has queries regarding contents and the time teacher should take response from students. The task of teacher is that, he/she should address students' problems individually. Teachers should be democratic towards students' queries by taking extra-curricular activities. The learners would make active participation in the

lesson and the individual differences could be supported by increasing the experiment and school trips (Kubat, 2018).

Teacher's teaching becomes successful and effective only when his/her students feel confident of the contents they are taught. In this regards I have conducted interview with students and teachers. Student's responses were,

Our teacher gives a lot of time to teach all students in class. But sometimes he provides time for us as individually according to nature of course. Teacher suggests to be asking any quires while we face problems and then we ask our problems with teacher.

It is an important for teachers to know variables such as physical characteristics, intelligence, perception, gender, ability, learning styles, which are individual differences of the learners. An effective and productive learning-teaching process can be planned by considering these individual differences of the students. Individual differences are important for determining the learning styles of students (Kubat, 2018). In this regards I took interview with educators and E2 argued that,

The teacher and facilitator should be identifying each student's individual differences, needs, desires and interest. Then teacher should start the lesson for teaching. It makes teaching learning activities effective and a student shows their internal creative ideas and views in classroom.

Students identify their individual differences with the help of test, homework and activities during the teaching and learning process and in order to design the learning-teaching process appropriate to the individual differences of the learners, the learners would make active participation in the lesson and the individual differences could be supported by increasing the experiment and school trips (Kubat, 2018).

Making Co-operative Learning Strategy. By engaging all students in learning; according to student's voice, choice and rights that creates democratic environment in classroom. Students can grab knowledge, skill and attitude from their choice by engaging mates as well as subjects' teacher. It is difficult to precisely define cooperative learning because of the large variety of learning settings that are regarded as facilitating cooperative learning and the differences among them (Davidson, 1990).

Diversity cannot be interpreted by class teacher only by relying on books. Much information about different cultural and ethnic heritages cannot be attended through reading books (Kranoff, 2016).

The teacher can be responsible to all students in their learning by providing co-operative strategy. Students can follow such strategy by asking owns problems with their friends and teacher. Teacher should create this type of democratic environment to all students. In this regards, I took interview with teacher and the teacher's responses were,

In the classroom we can find much diversity in teaching learning process. Some students are gain contents logically and some are from rote memorization. I always try to teach and opine that mathematics can be learned without memorization. It is a logical subject that is why we can learn mathematical content process by process. So, I suggested that they should share different ideas with their friends that make them strong in learning for long term. I consider another unique strategy that is the mobilization of fast-learning students in every bench and they mentor for slow-learner and I monitor them at the same time.

Above responses of teacher verified with Vigotsky's theory that is social interactions and participations of group members play a key role in developing

knowledge. So, the teacher should create different group of students in classroom for better learning. In this regards educators argued that,

Nowadays co-operative learning strategy is slowly coming into practice in our context. It is the modern way to deliver mathematical contents easily. In this scenario, the role of teacher is to mentor and the students should be active in learning. Teacher should provide opportunity for all students in classroom according to their understanding level. To make classroom attractive teacher should address students' daily life problems from their society and culture. So, students can take content easily as their understanding level without any rote memorization.

In the same concern, (Wagle, 2017) also claimed that in same concerned as mentioned above; for making classroom discourse students friendly through: culturally based pedagogy, by using different strategies in teaching-learning mathematics in the classroom, by replication of communities of practice in the classroom, by avoiding rote memorization, by implementing co-operative learning.

Providing Opportunities and Motivation. There are so many superstitions in society towards mathematics subjects. For example, mathematics can only be studied by talented persons, elites and male dominated subject etc. Motivation directs controls and clarifies the human behavior. Some students seem naturally enthusiastic about learning, but many need or expect their teachers to inspire, challenge, and stimulate them (Acharya, 2013).

However, if family, society as well as school create proper environment by providing lots of opportunities then students can take better position in the field of mathematics. Motivations provide internal power to do something for learners. In this regards, I have observed class while looking at strategy of teacher in class nine.

Teacher struggled to manage classroom effectively by caring students' behavior and he also gives attention towards back benchers too. Before starting to teach lesson, he has asked all students by using apple techniques; where we can use menstruation in our daily life? Then, teacher started lesson by saying; "our today's lesson is very easy but important and useful in daily life". Teacher was focused on student's attention towards lesson and he also motivates and helps for students to say something which can provide opportunity for students to express internal efficiency of every pupils. He also informs about practical field of contents. Thus, students were motivated to acquire this content knowledge.

Yetkin (2006) claimed that students were given opportunities to experience success by engaging with the tasks and activities through multiple representations during collaborative, co-operative as well as individual learning activities. In this regards, Teachers' response was,

All students have different capacity, their interests are also different. If teacher could be able to show proper guidelines and provide opportunities, then students will become motivated to do something. Students themselves are able to solve own problems if they took root of knowledge. Thus, to maintain equity, I properly provide more opportunities and motivation rather than providing readymade prepared solution.

In the same case, educators suggested that motivation and encouragement helps students for learning new aspects. Teacher always should respect to all students views regarding in related contents which helps for students to produce individual experiences and obstacles. In this context, Herman (2007) argued that teachers need to use all forms of representation equally and not show bias towards a certain form and

students will pick up on this preference and tend to favor the form chosen by the teacher.

Only by knowing, working with, and personally interacting with members of diverse groups can students really learn to value diversity, utilize it for creative problem-solving, and develop an ability to work efficiently with diverse peers (Johnson & Johnson, 2000).

From the above responses, it can be concluded that each and every student can learn mathematics if they get opportunities, motivation and proper environment.

Connecting Cultural Phenomena with Mathematical Contents. The first learning places are home, society and culture for all children. Parents as well as family members are the first informal teachers for pupils. While students entered school to learn; their culture also entered in classroom. Thus, teachers need to address all desires of students while teaching. Landson-Billings (1994) uses the term culturally relevant pedagogy to denote a type of teaching that incorporates student culture in order to preserve it and overcome obstacles that may arise due to the weight of the dominant cultures.

In this regards, I have conducted interview with teachers then I got followings responses,

Maximum number of student perceive mathematics as a vast subject rather than other subjects even while knowing the important of this subject in our daily life. However, I start lesson connecting theoretical contents with practical fields by taking example from students' cultures and society. I also explain to students that all the contents mentioned in course have socio-cultural norms and values. All contents are advocated according to human needs. So, mathematics cannot be separated from our society and culture.

In this regards Vygotsky's socio-cultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture. Likewise, in this regards educators argued that,

A good teacher should give wider concept and daily usable examples in classroom and then, that motivate students towards mathematics learning. Finally, students become self-reflected and self-directed about the concept of mathematics that can relate with our socio-cultural phenomenon. If students realize about use of mathematics, applied area of mathematics, social norms and values of mathematics, then the students' themselves get motivated to learn mathematics. Thus, mathematics cannot be far from our socio-cultural phenomena.

From the above responses, all mathematical contents are developed from the society as part from the human needs. If teacher connect each and every mathematical contents from students social background, they would realize that mathematics contents are usable subjects in our daily life.

Arranging Extra Class. All students cannot grab all content equally. Behind this, there are many reasons such as students' interests, choices and needs. During the teaching, teacher should accomplish prescribed curriculum standard. In this regards, in the time of interview, I have raised question for teacher, how do you address all students while students are not able to achieve goals from the single period of class? The teacher replied that,

Single period is not sufficient to complete full course of mathematics by addressing individual differences of students. Meanwhile, we need to conduct extra class for especially English, Mathematics and Science. In the time of class evaluation, all students cannot give proper answer. For that type of

students, we have suggested to attain extra class in these subjects for their deeper and better learning. In extra class, I teach these contents which are taken as difficult by students.

Socio- cultural difference is the main reason to create classroom diversity. Diversity creates problems for teacher to organize proper teaching. To address individual differences of students we need to manage more time except specified time. That is why extra class becomes a key solution for taking students' difficulties which help to promote equity. In the same context, E1 argued that,

In our Nepalese society, people believe that mathematics is vast subjects compared to other. So, maximum parents suggested their children to take home tuition and extra class of mathematics subjects which helps to enroll in access of mathematics.

From the above responses, extra class makes effective learning for those students who are deprived from single period of school standard class. If students get lots of chance and opportunities, then it helps to maintain equity.

Taking Formative Evaluation Regularly. Evaluation is the checking tool for expected objectives and goals. Formative test is taken for improving efficiency in representative tasks. In instructional field, weekly test, unit test, monthly test and terminal tests are the tools of formative evaluation. These types of evaluation enable to find out the students' weaknesses. With the help of the results coming from formative evaluation, teacher can provide feedback according to individual weakness of student. In this regards, I have asked questions for teachers, how do you know about students' weaknesses in learning? How do you address students' difficulties in learning? Teachers replied that,

To identify weaknesses in leaning, we can measure only by evaluation. To raise students' efficiency in learning, formative evaluation is the best way. For this, we have mainly conducted unit tests and weekly test regularly as well as terminal tests. From this evaluation and analysis of results we provide individual feedback for students and their guardians.

Formative evaluation helps teachers and students for improved teaching activities. In this regards, educators are also suggested to take formative evaluation continuously for promoting equity in socio-culturally diverse mathematics which makes active participation of students on a variety of topics.

Chapter-V

Findings, Conclusions and Implications

This chapter deals with the finding, conclusion and implication of the study. After the 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. An implication of the study is given for the area where this study can be applied. From the analysis and interpretation of data, I have derived following findings, conclusions and implications.

Findings Related with the Problem Faced by Teacher While Managing Equity in Culturally Diverse Mathematics Classroom.

Equity is the modern way to bring those students in margin into the mainstream educational activities. That is why we can say that, it is the positive discrimination for maintaining equal opportunity. However, it is challenging for teacher to maintain equity in socio-culturally diverse mathematics classroom. I have mentioned the potential challenges and problems which are found from this research and study,

-) Student's low achievement in mathematics from basic level as per desired objectives as mentioned in level-wise curriculum.
-) Different cultural background brings variation in the understanding level of students.
-) Difficult in completing course on time according to specification chart.
-) Lack of socio-economic background makes less responsibility of parents towards their pupils' study.
-) There is no reciprocal between subject teacher and administrative co-ordination team.

-) Relatively weak students are found more passive towards study.
-) Curriculum is failure of to address diversity of all society and culture that create problem to in select the medium of instruction according to student's language, ethnic and culture.

Findings Related with the Strategies Used by Teacher to Promote Equity in Culturally Diverse Mathematics Classroom.

Here, in instructional manner strategy indicates what types of methods are used by teachers to teach mathematics? How do they solve the problems of students? How do they arrange mathematics classes by addressing students' diversity? In another words, instructional strategies are techniques that use by teacher to take attention of students towards his/her teaching for creative learning. To find strategy used by teacher for promote equity in classroom; I have conducted class observation, semi-structured interview with educators, teachers and students. From these tools and overall study of dissertation, I have carried out following findings:

-) Teachers are teaching in classroom by addressing individual differences.
-) Teachers are following democratic behavior for making co-operative learning.
-) By providing opportunities and motivation through contextual references from society.
-) Teachers connect cultural phenomena with mathematical contents for engaging students from all socio-culturally background.
-) To enrich students' performance in mathematics learning, teachers suggested administrative team for managing extra class.
-) Unit test, weekly test and terminal test are taken continuously to identify students' weaknesses and treat for them.

Above mentioned findings will help to find problem faced by teachers to maintain equity and offers strategy to be used by teacher to promote equity.

Conclusions

This study was mainly focused on the main problems which are faced by teacher while managing equity in culturally diverse classroom. Behind this, it is also helpful to find out the strategies that are used by teacher to promote equity in culturally diverse mathematics classroom. Here, subsequent paragraphs show overall conclusion regarding problem faced by teachers and strategy to be used by teachers while managing equity in socio-culturally diverse mathematics classroom.

Teachers are facing many problems while managing equity. For example, teachers are facing problem in selection of appropriate medium of instruction according to student's language, ethnic and culture; different cultural background causes variation in understanding level of students that create problems for teacher to address this diversity. Student's low achievement from basic level and student's weak performance according to desired objectives as mentioned in level wise curriculum also affects to manage equity. In that time, teacher needs to spend more time to treat low performer students which creates another problem for teacher to complete full course on time according to specification table. Parents are seem to have negligence with their pupil's study and they are not helpful for teachers and school to arrange extra classes and careless about creating appropriate learning environment for students. Administrative teams also are not responsible with each and every subject teacher for proper management of the teaching. It can be concluded that teacher cannot only enrich students' learning in the absence of parents and whole school administrative team. Curriculum of mathematics is not sufficient to address all socio-

cultural phenomena which creates problem for teacher to manage equity in culturally diverse mathematics classroom.

Every teacher wants to make effective teaching learning process. Meanwhile, teachers use many strategy to promote equity in socio-culturally diverse mathematics classroom such as addressing individual differences, arranging co-operative learning, providing opportunities and motivating, connecting cultural phenomena with mathematical contents, making representative parents aware and responsible, creating proper environment of family as well as society, suggesting administrative team for manage extra class, following democratic behavior with all students and regular unit test, weekly test and terminal test for 'promotion of equity'.

Implications

Major focuses of this study was to carry out the problems that are faced by teacher while managing equity and strategy to be used by teacher to promote equity in culturally diverse mathematics classroom. That is why; the main implication filed of this study concerns with educational fields. The main implication of this research can be listed as below:

-) This research would be a milestone for mathematics teachers to select proper strategy to promote equity in socio-culturally diverse mathematics classroom.
-) This research would be fundamental base for teachers and educators to seek the problems which are faced by professional teachers while managing equity in socio-culturally diverse mathematics classes.
-) It may develop positive attitudes of educator towards mathematics by addressing equity.

-) This research may become pioneer to attract pupils' attention towards mathematical content.
-) It provides a little base to fulfill the slogan "mathematics is the weapon of changing the society".
-) It is helpful to reduce the possibility of discrimination by democratizing the diversity in mathematics teaching.
-) It gives proper guideline for novice teacher to make effective teaching in the perspectives of equity approach.
-) It provides basic guideline to follow students' centered approach by raising students' participations.
-) It will be base for researcher and educators to carry out further research in similar fields.
-) It shows the scenario for all readers about the way of teaching in socio-culturally diverse mathematics classroom.
-) It makes responsible for school administrative team and parents towards students learning.
-) It is helpful to develop culture-friendly curriculum by addressing cultural phenomena.

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Appendix-A

Classroom Observation Guidelines

School's Name: Address:

Name of Teacher: Gender:

Number of Students: Male: Female:

Teaching Experience: Duration:

Class: Topic:

Period: Time:

Teacher Spends Time in Classroom:

The researcher observed the classroom under the following criteria.

Classroom infrastructure

) Learning environment of classroom
.....

) Instructional materials
.....

) Management of seat planning
.....

) Other available resources
.....

Teacher's activities in Classroom

) Classroom entrance
.....

) Medium of communication
.....

) Regularity and homework checking

-
J Revision of pervious lesson
.....
- J Use of instructional materials
.....
- J Collaboration and discussion in subject matter
.....
- J Motivation and encouragement towards students
.....
- J Links students' knowledge with lesson
.....
- J Teacher's behaviors towards students
.....
- J Teacher's teaching style
.....
- J Creates a proper learning environment
.....
- J Method of teaching according to understanding level of students
.....
- J Teacher attention towards last benchers
.....
- J Class work assignment
.....
- J Evaluates achievement during the class
.....

-) Feedback and extra time for relatively weak students
.....
-) Providing guideline further learning
.....
-) Providing notes to the students
.....
-) Concludes the lesson systematically
.....
-) Homework assignment
.....

Student's activities in Classroom

-) Discipline in classroom
.....
-) Medium of communication
.....
-) Position of learning with textbook, copy and other instructional materials
.....
-) Completion of homework, assessment and class work
.....
-) Interaction with teacher and mates
.....
-) Collaboration and discussion in content
.....
-) Attention towards study
.....

) Student's behaviors towards teacher

.....

) Student's learning style

.....

) Class work assignment

.....

) Student satisfaction towards lesson

.....

) Participate in classroom discussion

.....

) Following direction of teacher

.....

Observed By:

Date:.....

Appendix-B

Interview Guidelines for Teacher

Name of Teacher:..... Gender:.....
Teaching Experience:..... Duration:.....
Class:..... Teaching
Time:..... Number of students:.....
Male:..... Female:.....

The interview was conducted on the basis of following points:

Problems to manage equity

-) What type of problems have you faced while teaching mathematics?
.....
-) How does diversity affect in teaching?
.....
-) Is 40 minutes time (per day) sufficient for addressing all students individually?
How you treat them?
.....
-) What about the responses of parents towards their children in learning
mathematics? Do they consult with you and how?
.....
-) How does administrative team help to your teaching? Is administrative team
responsible for all relatively weak students?
.....
-) How were students participating in your teaching time? How do you behave
them?
.....

) Is mathematics curriculum favorable to our socio-cultural needs?

Strategies to promote equity

) Do you prepare lesson plan before enter the class?

.....

) What types of teaching methods you use in classroom to promote equity?

.....

) How do you create interactive learning environment by engaging all students?

.....

) How do you arrange mathematics class by addressing students' diversity?

.....

) What types of strategies do you follow to address individual difference?

.....

) How do you present lessons as per equity principle by addressing socio-cultural diversity?

.....

) How do you establish co-operative teaching strategy to address relatively poor students?

.....

) How do you engage students towards teaching?

.....

) How do you solve the language problems of students?

.....

) How do you connect different cultural phenomena with mathematical content?

.....

) What types of role do you play to make students' effective learning in mathematics?

.....

) How do you treat socio-culturally marginalized and relatively weak students?

.....

) Do you describe the problems individually to the students?

.....

) Do you include them in extracurricular activities?

.....

) Does your school administrative team provide instructional materials to you?

.....

) How do you use teaching material in teaching?

.....

) How do you identify students' weaknesses in learning and how do you treat them?

.....

) How often a time do you consult with parents about student's achievement?

.....

) How to promote equity in socio-culturally diverse mathematics classroom?

.....

Appendix-C

Interview Guidelines for Students

The interview was conducted on the basis of following points:

-) Which subjects do you relatively like to study more?
.....
-) How do you take mathematics subject as compare to other?
.....
-) Do you know about the application field of mathematical contents?
.....
-) Is mathematics curriculum contextual with our socio-cultural phenomena?
.....
-) Do you enjoy learning mathematics?
.....
-) Are you satisfied with your teacher's teaching styles of mathematics?
.....
-) How do you feeling towards mathematical content? Are they useful in our daily life?
.....
-) Do you ask questions frequently with teacher and mates while you feeling difficult to understand?
.....
-) Is teacher giving you time to address your individual problems? If, how and when?
.....
-) What type of problems have you faced while learning mathematics?

Appendix-D

Interview Guidelines for Educators

The interview was conducted on the basis of following points:

-) What about the condition of mathematics educator in our context?
.....
-) What do you feel about educational research of mathematics?
.....
-) Is equity help to bring change in mathematics learning?
.....
-) How do you suggest mathematics teacher for better teaching?
.....
-) How does teacher can use appropriate instructional materials while teaching?
.....
-) How does teacher can address individual differences of learners?
.....
-) What types of strategy need to follow by teacher for ‘promotion of equity’?
.....
-) How do mathematics teacher can create co-operative learning environment?
.....
-) How do you provide guideline for teacher to address students’ socio-cultural diversity?
.....
-) How do teacher can adopt ‘principle of equity’?
.....

