

EXPLORING STUDENTS' PERCEPTION OF EQUITY IN MATHEMATICS CLASSROOM

Thesis Submitted By

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DECLARATION

I hereby declare that the work presented in this thesis entitled "**Exploring Students' Perception of Equity in Mathematics Classroom**" has been done by myself and has not been submitted elsewhere for the aware of any degree. All sources information has been specifically acknowledge by reference to the authors.

Date: 2079/03/12

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ABSTRACT

This study focused on "Exploring Students' Perception of Equity in Mathematics Classroom". The objectives of this study were to explore the students' perception of equity, to find out the challenges faced by the teachers to maintain equity and to find out the strategies for reducing the challenges of maintaining equity in mathematics classroom. In dealing with such objectives, I applied interpretive qualitative research design and ethnography approach to explore the multiple realities through the methods of open-ended interview, observation and as a research tools. Five students were selected from the Department of Education, Department of Mathematics Education, Prithvi Narayan Campus, Pokhara through purposive sampling. Five mathematics teachers were also selected as a sample of this study. The data analysis went through multiple layers of thematic analysis and interpretations of narratives from interview data. The collected data were analyzed with the help of theories and related literatures.

I found that students understand equity in mathematics classroom as counseling, learning strategy, linguistic, fairness, social process and caring marginal students. Teachers seemed to provide equal opportunities and access to their students to equity just classroom. The challenges for creating socially just classroom include: diverse students, gender gap, cultural differences, insufficient teaching materials, student absenteeism, different interests of students and marginal students. Thus, the teachers need to apply different strategies such as counseling, group work, linking mathematics on daily life, enjoyment, demonstration and encouragement for reducing the challenges to maintain equity in mathematics classroom. Such strategies are likely to give new and practical ways to understand the issues of equity in mathematics classroom.

Also make the mathematics classroom more inclusive and justifiable.

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CHAPTER I

INTRODUCTION

Background of the Study

Nepal is multicultural, multilingual and diversified country. The main aim of education is to enforce the people to become just and fair humane from men and women via different means that promote to acquire suitable knowledge and skills with the development of their own culture and values perpetually. For these purpose teaching and learning mathematics plays vital role for fostering their innate power to develop constructive knowledge, logical power, problem solving skill, develop professional skill, easy to solve daily home arithmetic and computational skills of mathematics to enhance their life for the human civilization. But, the people from diversified society have needs different types and level of supports to attain their own goals (Parajuli, 2019). So, we as a mathematics teacher or facilitator should provide equal opportunities for equal needs and unequal opportunities for unequal needs to maintain the equity in mathematics classroom.

Equity in the classroom means making sure every student has the resources and support they need to successful. In a equitable classroom, individual factors don't hold back students from teaching their full learning potential factor like, race, culture, gender, religion, ethnicity, sexual orientation, immigration experiences, social economic status.

According to English and (Rai, 2012, as cited John, 1994) transforming changes everything and give example of metamorphosis of schools. It means we can

change our traditional teacher centered mathematics classrooms through the process of transformation. Transformation will occur through becoming a reflective practitioner and conducting the equity pedagogy in mathematics classroom. Equity pedagogy involves the students for generation of transformative knowledge rather transmission of knowledge. Thus equity pedagogy create the child friendly environment with co-operative learning and teacher supports the students strongly as their need for better performance that maintain equity in mathematics classroom and change the morphology of traditional classroom.

Equity can be a loaded term of many people, abstract for others, misunderstood by many and even perceived as not content-specific by some. Discussion of 'equity' can be difficult because it is operational zed, utilized and understood in a variety of ways, based on different people, situation, and environments. It would be naive to think equity is a simple, self-evident and interpretation of different educational sciences (Luke, Green & Kelly, 2010). The goal in mathematics education is to promote equitable opportunities and outcomes for students. This assumes neither equal approaches nor equal outcomes. Rather, the outcomes are impartial, given the natural variation between students in terms of strength and interest, between females, males, those in poverty, middle class, rich, first nations, Anglos, Blacks, Chinese, and so on. Keeping equity and excellent at the centre of "The increasingly popular mathematics for all rhetoric" (Martin, 2003, P. 7).

In regards to mathematics classroom of our society, different students have different culture, language, socio-economic status, chronological and mental age, interest, value, and intellectual development etc. But, our tradition of T/L style is stereotypic in nature. The role of teacher is to provide formula and instruction to solve

the pre-established problem in textbook and practice book as a writer interest and related to syllabus. The student role is to memorize the formula and solve the problems of textbook with the instruction of teacher and involving in drill such that there is not provided the chance for students to create and envision the mathematical problem and alternative solution. The system of T/L pedagogy has strictly enslaved by taken for granted assumption. To overcome these shortcomings in T/L mathematics and enforcing the transformative T/L process for addressing equity issues in mathematics classroom I have decided to study of exploring the strategies of equity in mathematics classroom.

Tanko (2012) defines equity as ways of teaching that helps learners to understand their world better; it includes issues of equal opportunities for jobs and income, and civic participation, information and support to their lives. Equity in education also refers to equity, justice and fairness in teaching and learning. In other words, it refers to a situation in which all students have equal right or equal treatment. And the social inequality is the condition of unequal access to the benefits of belonging to a society.

Equity advocates hope to build a society in which individuals have equal access to resources and receive equitable treatment regardless of their race, gender, religion, sexuality, income level or disability. Enabling conversations about these issues empowers students to voice their concern and question unfair situations in their lives or in the lives of those around them. To help students examine systemic inequality, teachers can have them consider questions such as: Who make decisions and who is left out? Who benefits and who suffers? Why is given practice fair or

unfair? What is required to create change? Answering these questions, students can start to recognize injustice existing at the micro and macro levels (Parajuli, 2019).

If we relate the concept of equity to the classroom, it refers to a class in which all students' voice are equally heard, they are treated equally, their views are respected, and they get equal opportunity to learn, suggesting that it has equity. Furthermore, equity has two dimensions: fairness and inclusion. Fairness involves individual and social situations such as socio-economic status, gender or ethnic origin should not be obstacle to succeed in education. Inclusion is taken as a notion in providing education to all (Ministry of Education and Education International, 2014).

The classrooms in Nepal have great diversity in terms of students' background. That means, there are students of different ethnic groups along with gender differences and their socio-economic status and physical disability. The diversity of student population has raised the issue of inequality in mathematics classroom. Therefore, teachers need multicultural education. Teachers applied very hardly single way of instruction to different students. It is challenging to change traditional instructional techniques and adopt multicultural techniques for teaching and learning mathematics. So the issue of equity is always burning. Globally, there are very few studies on equity issues in mathematics classrooms, and it is very rare in the Nepali context. Therefore, it is hoped that this study contribute to this field. Teachers need to be encouraged to try a new or innovative teaching method in their own context and integrate equity related principles more fully into their own training programs. So, I have tried to study about the equity in mathematics classroom on the perspective of students.

Statement of the Problem

In the context of mathematics classroom of our school, we have provided equal opportunities to each student while teaching and learning mathematics. But the different students have own interests, abilities, behaviors, values, socio-economic status and learning style. Since, we have neglected the students individual needs for generating own mathematical knowledge and manipulating skills and we have provided the instruction of our interest there become an unfair, unjust and biased treatment to solve the students problems. As a result students never success in their goal and we become unsuccessful mathematics teacher as well. Due to this most of the students have faced barrier of mathematics learning and students were suffered by anxiety and negative attitude towards mathematics.

School is also a miniature society, it may not be an exception from forming any type of biased manner and behavior to all students. Equity might also include provide equal access to curriculums with positive discrimination, resources and good teachers. Thus, the maintaining equity has been one of the major issues in education in general and mathematics education in particular. Being a mathematics student, I am motivated to carried out the research entitle explore the students perception of equity in mathematics classroom”.

This study attempted to seek the answer of the following research questions:

- How do students perceive equity in mathematics classroom?
- What are the challenges faced by the teachers to maintain equity in mathematics classroom?
- What strategies can be applied to reduce the challenges of maintaining equity in mathematics classroom?

To scope the challenges of mathematics classroom with diversified students, we should provide the strong support and fruitful opportunity to students as their needs and interests. We must apply different treatment with different level to enforce students for better mathematics learning. This may provide the equity in mathematics classroom. Thus, equity issue in mathematics classroom is main problem of my study.

Objectives of the Study

We can't meet the destination point without any objectives. Any people complete the work if he/she carry the objectives. So I want to focus equity issue in mathematics classroom. For this purpose, I have taken following three objectives of my study.

- To explore the students perception of equity in mathematics classroom,
- To find out the challenges to maintaining equity in mathematics classroom,
- To find out the strategies for reducing the challenges of maintaining equity.

Significance of the Study

The result of this study provides important knowledge that enables teachers, parents, society members and school family to eliminate equity in mathematics classroom. Equity related principles have even a great significance in terms of teaching and learning mathematics by creating equity classroom practices. Equity in mathematics classroom promotes learning of individual or group and it contributes to equitable ways of achieving equitable outcomes recognizing disadvantages. It makes girls and other marginalized students feel that they are equally valued.

Equity provides engaging, empowering, and authentic learning contexts for students in which mathematics skill can come alive and transcend the traditional limit and probe into abstract operations that have isolated and discouraged many students. As teachers are made more aware of the attitude of their students, they should be able to focus on the causes, effects, and consequences of the attitude and ways to address them in their teaching. This study helps to manage pedagogy for creating students positive attitude towards mathematics learning. Also, it helps the other disable, weak and marginalized students. Thus, the importances of this study are as follows:

- This study made aware to mathematics teacher about gender issues in teaching and learning process that support to improve integrated education system.
- This study helps mathematics teachers to provide equal opportunities and access to the students in the mathematics classroom.
- This study also helps to increase women's participation in science and technology field.
- This study helps to focus on the social variables that obstacles student for the further enhancement.
- This study helps the school administration to create appropriate school environment for all kind of students.

Research Questions

Research questions are the kind of question which helps to obtain the research objectives whose kind of problem wants to solve by researcher questions. Researcher make the research questions to obtain the result of research objectives. It also strongly supports. The researcher to find the solution of emerged problem in the field of study.

So, I have produced research questions which are strongly related to the objectives of my study. The research questions of this study were;

1. How do students perceive equity in mathematics classroom addressing racial, gender, linguistic and intellectual issues?
2. How the teachers have faced challenges while addressing equity issues in mathematics classroom?
3. How do teachers way-forward with the challenges of equity in mathematics classroom?

Delimitation of the Study

This study has following delimitations:

- This study was limited to the Department of Education, Department of Mathematics Education, Prithvi Narayan Campus, Pokhara.
- This study was limited to five students, five teachers in mathematics education only.
- This study was limited to maintain equity in mathematics classroom.

CHAPTER II

LITERATURE REVIEW

Review of related literature is source of further study for the research task. The review of the related literature is also an essential part of research for the researcher because literature helps and guides research to meet theoretical way for the study.

Literature provides strong knowledge and it facilitates to select appropriate research problem. The main purpose of review of related literature is to find out what have been done in the field of the research. It helps to conduct the new research in a systematic manner by providing the general outline of the research study and avoids unintentional replication. Through studying related research, investigators learn which methodologies have proven useful and which seems less promising. So, I have reviewed the following empirical and theoretical literatures related equity.

Empirical Review

A brief summary of the previous researches and writing of recognized experts provide evidence that the researcher is familiar with what is already known and untested. Since effective research must be based upon past knowledge, this step helps to eliminate the duplication of what has been done, that provides useful suggestion for significant investigation. Several types of related literature were reviewed in this study which helps to make the concept clear for the study and also direct to analyze and interpret the data with this assumption, some related literature are reviewed as follows:

The research finding of Gharti (2006) shows that teacher perceptions towards student centered method was misunderstanding. Most of the teacher believed that teacher should be at the in front or at the centre rather with students working together. They believed that teachers' tone could be commanding rather than polite, homework defaulters should be punished rather diagnosis, teacher follow the preaching of knowledge rather than involve students in activities, discussion and brainstorming. The result of this study shows that related agency should play vital role to literate the principles and strategies of child friendly student centered classroom.

The finding of Bajracharya' research (2007) shows that prior achievement, peer group interaction and students regularity in classroom have positive correlation with mathematics achievement scores but the variable like age of the students has negative correlation with mathematics achievement score. But, there was negative relationship between age and mathematics achievement which is contradiction of the Piaget's theory of cognitive development. Since, from the beginning of formal operation stage students can develop logical reasoning and mathematical abstraction. The study was conducted on students of grade 8, which is the transition from concrete operational period to beginning of formal operational period. Thus, there exist other factors like overloaded work in home, influence of adolescence etc. have greater influence on students' achievement. Thus we as mathematics teachers should careful about these factors.

Another finding of Bajracharya's study shows that qualification, experience and training have negative correlation to the students' mathematics achievement score. Which result challenges the mathematics education program and prospective

mathematics teachers of Nepal. We as mathematics teachers must be more reflective and transformative to overcome these types of shortcoming.

The study of Thapa (2012) reported that the school culture have influenced girls with disabilities (GWDs) both positively and negatively as per the socialization among non disabled peers and teacher behaviors, available facilities and opportunities in participating in different activities in their school. Furthermore, the vision impaired and physically impaired GWDs were integrated through there were limited physical facilities and the GWDs had both helpful and alienating cultures in the school. However hearing impaired to have to bear minimum physical facilities but as the social environment is favorable to they like to spend more time at school rather than at home. Despite their disability all GWDs were found enthusiastic to education and they perceive themselves equally capable non-disabled counterparts.

An auto/ethnographic study of Gautam (2016) in Kathmandu valley shows that the teachers of the private school have gradually realized the important of shift of approach from traditional teacher centered one way traffic to more student centered, differentiated and group works, project work and research focused types teaching method in classroom. Furthermore, the research findings show that there is still a lack of appropriate training program and enough support from school management team, educational agencies and other stakeholders.

In a context of teachers' perceptions of equity in mathematics classroom, the qualitative interpretative study of Panthi, Luitel & Belbase (2018) highlights five dimensions: equality, equity, fairness, social process and caring of students as a means of equity in mathematics classroom. Mathematics teachers perceive equality as dimension of equity is related with treating all students equally. Teachers view about

equity students' having similar position in their classroom in term of their roles, responsibilities and share of resource. Teachers' perception of fairness connects to the teaching without bias, providing equal opportunities and transparent classroom activities. Teachers' perception about social process as a means of equity relates to sense of belonging to groups, feeling of connected and devotion of each other development. Teachers' perception about caring linked with caring marginalized students in classroom, helping them in learning by providing extra time for coaching or guiding, and improving their performances.

Pokhrel (2014) studied on the topic “Gender discrimination: Women perspectives”. The main objective of this study was to explore the perception of women in discrimination in various aspects in a male dominated society. The study was designed by descriptive study based on sample survey. The total of 200 women was selected randomly for this study. The findings of her study showed that there is a discrimination against women in various aspects. Women are aware of discrimination in the societal and household levels. They perceive more discrimination in the societal level comparing to household level. Married women perceive more discrimination in mobility, property, occupation and education. Similarly, unmarried women perceive more discrimination in mobility and way of behaving. They consider gender and customary practices as major factors responsible for discrimination.

Wonnacott (2011) conducted a research on “Teaching mathematics for equity and its effects on affluent students”. The main objective of his study was to explore the effects of incorporating equity issues in mathematics with affluent, middle school students. This study used action research. Teaching mathematics for equity is a pedagogy that uses mathematics as a tool to expose students to issues concerning

power, resource inequities, and disparate opportunities between different social groups to illegal social and political action. Findings indicate that integrating equity issues into mathematics affected some students' cognitive and affective domains and in some cases led to empowerment and action. The study also found that students' perception of responsibility, their age and personal connections along with the amount of teacher direction may have affected students' development of social agency. These findings help to inform teachers' practices and contribute to literature on critical mathematics.

Shastri (2014) studied on the topic "Gender Inequality and Women Discrimination". The main objective of this study was to find out the various forms of discrimination in women. Men and Women are two wheels of a cart. Female of our country have faced the discrimination throughout the ages and still to be continued in various forms. Usually, discrimination is influenced by cultural norms and tradition, religion, region etc. Biologically and sociologically both are assigned to different role. Physically a female role is to look after house, children, family and relatives and on the other hand men are made for bread earner, for hardship and for struggle for earning. All these thinking made our women weaker and deprived of basic things. Both are equal in human right. Women are discriminated in this male dominating society. As a result most of women are unable to understand their own right and freedom. They are not free in this so-called "Society". Thus, discrimination not only hampers women future but also impedes the country growth.

Theoretical Review

The basic idea of constructivist theory is knowledge can't be instructed by a teacher, it can only be constructed by a learner (Gharti, 2006, p. 24).

Vygotsky's socio-cultural theory. To identify the emerged problems and to encounter the challenges while establishing equitable mathematics classroom having diverse students from cultural variation, Vygotsky's socio-cultural theory provides greater insight to us. So, I will use the Vygotsky's socio-cultural theory as theoretical framework in my inquiry.

According to Vygotsky, infants are endowed with basic perceptual, attention, and memory capacities that they share with other animals. These develop during the first two years through direct contact with the environment. Then rapid growth of language leads to profound change in thinking. It broadens preschools' participation in social dialogues with more knowledgeable individuals, who encourage them to master culturally important tasks. Soon young children start to communicate with themselves much as they converse with others. As a result, basic mental capacities are transformed into uniquely human, higher cognitive process. (Berk, 2013, p. 266)

Vygotsky's socio-cultural theory asserts that complex form of thinking have their origins in social interactions rather than in the child's private explorations (Bee & Boyd, 2003, p.45). According to Vygotsky, children's learning of new cognitive skills is guided by adult, who structures the child's learning experiences, a process called scaffolding (ibid). Vygotsky believed that children's learning takes place within the zone of proximal development (ZPD) (Berk, 2013, p.267). ZPD is the range of tasks too difficult for the children to do alone but possible with the help of adults and more skilled peers.

Reciprocal Teaching and Cooperative learning are new educational innovations based on Vygotsky's socio-cultural theory. In reciprocal teaching, a teacher and two to four students form a collaborative group and takes turn leading

dialogue on the content of text passage. Within the dialogue, group member apply four cognitive strategies: questioning, summarizing, clarifying, and predicting.

Reciprocal teaching uses peer collaboration, a teacher guides it and helping to ensure its success. In cooperative learning, small group of classmates works towards common goals. Teaching through cooperative learning broadens Vygotsky's concept of ZPD, from a single child in collaboration with an expert partner to multiple partners with diverse forms of expertise stimulating and encouraging one another. (Berk, 2013, pp. 271-272).

In regards with the process of learning by child in the society, Vygotsky stressed that the cultural development on child occurs in two phase: Interpersonal and Intrapersonal. First phase concerns with the communication between of child and others whereas second phase concerns communication within the child.

Furthermore, the process of internalization consists of a series of transformation:

- a) An operation that initially represents an external activity is reconstructed and begins to occur internally of particular importance to the development of higher mental process is the transformation of sign-using activity.
- b) An interpersonal process is transformed into an intrapersonal one.
- c) The transformation of an interpersonal process into an intrapersonal one is the result of prolonged series of developmental events (Vygotsky, 1978, pp.56, 57).

Bourdieu's theory of practice. Bourdieu's theory of practice (1972) comprises three main elements, namely field, capitals, and habitus. The interplay of these elements leads to strategy or practice, i.e. our unconscious behavior that is conformity with our interest and that aims at achieving our objectives by investing capital and fighting for

capital (Walther, 2014). Bourdieu's theory of practice provides the great insight to the researcher to conduct research properly. Bourdieu sees the necessity of vigilant reflexivity in the research process, but also regards this vigilance as being central to an appropriate research habitus within the social science for producing good research and theory (Rawolle & Lingard, 2013, p.128). Where, habitus in Bourdieu's term is ensemble of schemata of perception, thinking feeling evaluating speaking and acting that structure all expressive, verbal and practical manifestations and utterances of a person (Walther, 2014, pp 12,-13).

Using Bourdieu's concept of field in social research entails three distinct operations. First, the relationship of the field in question to the 'field of power'(politics) must be understood. The field of power is thus to be regarded as the dominant or preeminent field of any society; it is the source of the hierarchical power relations which structure all other fields. Second within the field in question one must construct a 'social topology' or map of the objective structure' of the position which make up the field, and the relation between them in the competition for the field's specific form of capital. Third, the habitus(es) of the agents within the field must be analyzed, along with the trajectories or strategies which are produced in the interaction between the habitus and constraints and opportunities which are determined by the field. (Jenkins, 2002, p.86)

Bourdieu's theory of symbolic violence. Since, there exists a symbolic violence in mathematics classroom. Where the teacher and intellectually talent students have greater power (cultural and symbolic capital) in classroom (field) whereas the marginalized student have less power. So, the powerful groups (group of agents) try to exert symbolic violence on marginalized group by investing methods

and techniques (cultural capital). Thus, to analyze symbolic violences and addressing these issues Bourdieu's theory of symbolic violence may be helpful.

According to Bourdieu, symbolic violence is the imposition of the system of symbolism and meaning (i.e. culture) upon groups or classes in such a way that they are experienced as legitimate. This legitimacy obscures the power relations which permit that imposition to be successful. Insofar as it is accepted as legitimate, culture adds its own force to those power relations, contributing to their systematic reproduction. (Jekins, 2002, p.104)

In my research Bourdieu's theory of symbolic violence provide the inner eyes to watch the situation of classroom activities and social interaction activities. Through this tool I will be more reflective while imposing my vision and activities in my mathematics classroom. It also will helpful to analyze the data and building the theme from data.

Equity in educational policies

The issue of equity is gaining a momentum in the educational plans and policies in Nepal in recent years. The divide of the education system as private and the public is one of the much-debated issues related to equity in education in general and mathematics education in particular, in the country. The private and public education system in the country has produced two kinds of mentality with social implications leading to the division of the society. These problems reflect in the private schools (MOE, 2015). The government framed The National Curriculum Framework to help schools to frame their teaching and learning as per the government

directives and policy. The National Curriculum Framework for School Education in Nepal 2007 states that:

From the point of view of access and equity, the principle of positive discrimination needs to be adopted for the expansion of education. Therefore, the nation should make special provision for women, helpless and senior citizens, orphans with disability and economically and socially backward community. Furthermore, it should safeguard the right to education in mother tongue, guarantee the child rights and provide free basic education (CDC, 2007).

Hence, the document shows the policy of the government to provide equal access to education for all despite gender, age, and status of one's life. However, there is no seriousness in the concerned authorities to improve the quality of public education in Nepal leading to further deterioration of school mathematics curricular practice in the classrooms. As a result, there is a huge difference in student achievements in mathematics across the geographical locations, ethnic majorities, and gender (MOE, 2015). Recent study on National Assessment of Student Achievement (NASA) reported that;

In mathematics, the average achievement score is 57% in the private schools where as it is 26% in the community (or public) schools. However, it is not clear whether it is due to the effectiveness of instructional processes in the institutional schools or manifestation of the disparity of socio-economic status of students in these two different school systems (MOE, 2015, p.vii)

The disparity reported above in the achievement in private and public schools has been one of the major sources of social inequality in mathematics education. The report highlights that there is also a difference in the achievement of Dalit and some Janajati students compared to students from the majority communities in Nepal (MOE, 2015). The report further indicates that there is a wider gap in the students' achievement between rural and urban schools in Nepal. The achievement gap is about 24% in the grade 8 (MOE, 2015).

Recently, the Government of Nepal, Ministry of Education exposed School Sector Development Plan (SSDP) 2016/17-2022/23 which mentions about equity and inclusion. This policy document states, "there has been significant progress on strengthening equity, and there is now gender equality on a number of basic and secondary education indicators" (p.28). The same document states that there are still "many differences remain with children receiving inequitable access to quality education due to the gender, socio-economic status, language, ethnicity, caste, and geographical location and differing abilities" (p.28). Realizing these issues, SSDP has suggested for strategic interventions by consolidating equity-based strategies, using disparity-based formulas and indexes, strengthening the institutional capacity to provide inclusive education for all children (MOE, 2017).

When it comes to education policy in the country, the new constitution of Nepal (2015) has guaranteed the right to education in mother tongue until high school. It states that, "Every Nepali community living in Nepal shall have the right to acquire education in its mother tongue up to the secondary level, and the right to open and run schools and educational institutions as provided for by law" (part 3, 31.5). The provision is not a new one because Nepal had a similar provision in the Interim

Constitution 2007. Recently, the Ministry of Education introduced the National Education Framework for School Education in Nepal 2007 (UNESCO,2011) which embarks upon curriculum reform based on equity and access to mathematics education in Nepal due to lack of clarity in vision, mission , and enactment of educational plans and policies.

Equity in educational policies relate to equal opportunities and desegregation of higher education. The educational policies should create opportunities for all in education by implementing and enhancing equality indicators. There are three key elements in equity in educational policies –first, bringing excluded and marginalized students to the fore; second, applying equity audit to assess the effectiveness of equity policy in practice ; and third, adopting redistribution of resources in a fairer way and recognizing the cultural and social identity (Thrupp & Tomlinson, 2005). However, there is ongoing controversy in education policies unveils some of these controversies in relation to multiculturalism, accountability, and demands of educational standards.

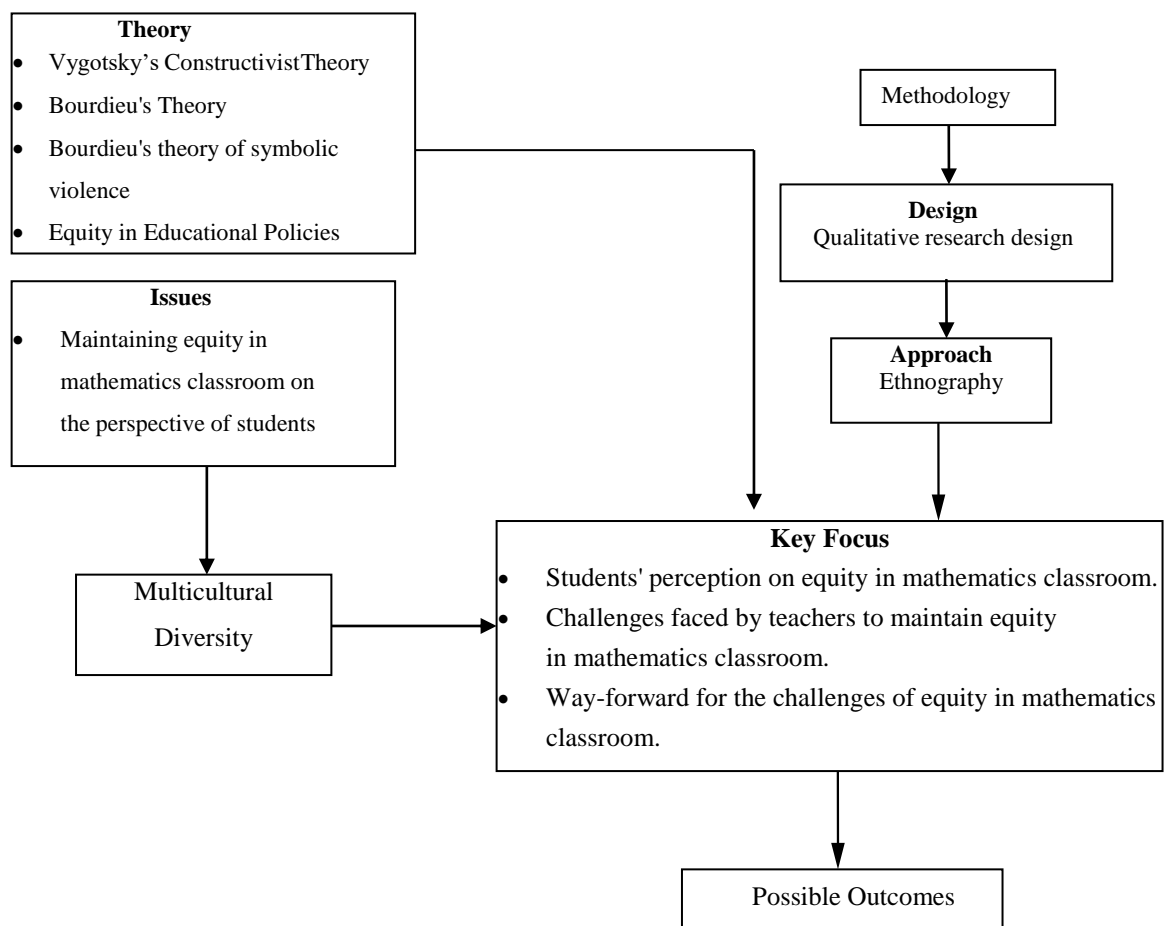
Conceptual Framework

Conceptual framework is a representation, either graphically or in narrative form, of the main concepts or variables, and their presumed relationship with each other. It brings clarity and focus, helping researcher to see and organize the research questions more clearly. Also, helps to make explicit what the researcher already know and think about the area and topic.

The theoretical approaches and the review of literature related to study mentioned above have provide a wide range of knowledge needed to adopt and appropriate research methodology and have also provided guidelines to follow

appropriate theories to analyze and interpret the findings. Here, the feminist theory could be used to analyze gender inequality and the promotion of women's rights, interest and issues the gender difference and the education policy could help to analyze equity in mathematics education. Similarly, the constructivism theory focuses on socio-cultural dimension. The above review of literature and theories, help me to draw the following conceptual framework

Figure: 2.1. Conceptual understanding of the study



The above conceptual framework shows that my study agenda is related to equity in Mathematics classroom. For this, I took students and teachers experiences and critical reflection in their existing practice of equity. This study aims to explore students perception of equity and challenges to maintain equity for the promotion of

equity and fairness in mathematics classroom with their strategies to reduce challenges to maintain equity for the promotion of equity and fairness in mathematics classroom. I applied interpretive inquiry method. I captured lived teachers and students through interviews. It is notable that interpretive inquiry has not specific rules to collect information. I also used related theory. Likewise, I generated the findings and conclusion based on multiple layers of analysis and interpretation of the narratives for my research.

To sum up, in this chapter, I divided the review of literature into two parts: empirical and theoretical. Based on this, I presented the conceptual framework of the study and described it.

CHAPTER III

METHODS AND PROCEDURES

This chapter presents the procedure of the study, which involves the design of the study, population, sample and sampling strategies, study area/field, data collection tools, data collection procedures and data analysis and interpretation procedures. It also explains the procedure of data collection. I adopted the following methodologies for this research work:

Research Design

Research design is ways through which the researchers collect the data, interpret and analyze. This is an ethnography related to maintain equity in mathematics classroom on the perspective of students. Thus, this study is qualitative design and ethnography approach. Qualitative research method involves the use of qualitative data, such as interviews, documents and observations, in order to understand and explain a social phenomenon. Qualitative research is interpretive in nature and the theoretical base is subjective reality as truth, a real knowledge (Creswell, 2005). Qualitative research being with assumption, a worldview, the possible use of a theoretical lens and the study of research problem inquiring into the meaning individual or groups ascribe to a social or human problem. To study this problem, qualitative researchers use an emerging qualitative approach to inquiry, the collection of data in a natural setting sensitive to the people and places under study, data analysis that is inductive and establishes patterns or themes. The final written report or presentation includes the voice of participants, the reflexivity of the

researcher, a complex description and interpretation of problem and it extends the literature or signals a call for action.

Ethnography Approach

Ethnography is a qualitative research method which involves a description of people and nature of phenomena. It is designed to explore cultures. It is designed to explore cultural phenomena where the researcher observes society from the point of view of the subject of the study (Parajuli, 2019). An ethnography is a means to represent graphically and in writing the culture of a group.

Ethnography is the study of people in the naturally occurring setting or field by means of methods which capture their social meanings and ordinary activities involving the research participating directly in the setting (Brewer, 2005). It focuses entries cultural group. Ethnography is a qualitative research design in which the researcher describes and interprets the shared and learns patterns of values, behaviors, beliefs and a language of culture-sharing group. Ethnography is also a way of studying a culture sharing groups as well as the final written product of that research as a process and outcome (Harris 1968, as cited in Creswell, 2005).

The profounder of ethnography are Boas, Milinowski, Radcliffe-Brown and Mead in early 19th century who had begun in like comparative cultural anthropology

In my research I involved extend observation of the group or class, most often through participant observation, in which I immersed in the day to day lives of the people and observed and interview the group. Thus my study is related to the ethnography approach.

Selection of Field

In dealing with the purpose of my research, I have selected Department of Education, Department of Mathematics Education, from Prithvi Narayan Campus, Pokhara, five students, five mathematics teachers through the purposive sampling.

Sample of the Study

Sample size of the qualitative research is not fix. There are no rules for sample size in qualitative inquiry. Therefore, the sample size of this study depends upon the researcher what s/he wants to know, what the purpose of research was, what can be credibility of the study and what can be done with available time and resources (Khanal, 2073). Thus, for the sample of my study I selected five students (one marginalized students, one girl, one normal student, one disable, dalit), five mathematics teachers from Department of Mathematics Education by the purposive sampling method.

Research Tools

This study mainly focuses on the interpretive qualitative method for data collection, analysis, and interpretation. On the basis of this study, interview schedule and class observation guidelines were used as tool for this study.

Class observation guidelines. Observation means to watch over all from the every point of view. Observation allows gathering data on the physical setting, human setting, interaction setting and program setting. Observation guideline is a kind of tool that helps to see the knowledge through the use of sense that is eyes, nose, tongue and skin. It has great important in my research works. As data gathering device, direct observation makes important contribution to descriptive research. Thus, for collecting

data I prepared the observation guidelines. Then I observed the classroom and collected the needed information through the observation guidelines (see appendix-1).

Interview guidelines. Which is the process of communication or interaction in which subject or interview gives the needed information verbally in a face to face situation. The open ended semi structure interview was administrated in this study on the basis of objectives. Prior to visiting the field interview schedule is already developed with reference to research objectives and with guidelines of previous researchers. The interview schedule included the information of key students, their opinion about classroom environment and school related conditions, mathematics learning, culture, gender difference etc. It is assumed that these variables are already established and they could influence to maintain equity in mathematics classroom. Mathematics teachers interviewed also. Direct face to face interview with respondent were taking. One set of interview guidelines was developed as an instrument for the collection of needed information which was used for girls students and other one/one set developed for teachers and educators.

Quality Standard

After completing the construction of the research tools, it is necessary to maintain quality standard. For the quality standard the reliability and validity of data were maintained by the following techniques:

Credibility: The credibility criteria involve establishing that the results of qualitative research are credible or believable from the perspective of the participant in the research. Since from this, the purpose of qualitative research is to describe or understand the phenomena of interest from the participant's eyes, the participants are the only ones who can legally judge the credibility of the results. For collecting data I

observed class and took interviews with teachers and students. This helps to maintain reliability of data.

Transferability: Transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings. After completing my research it can be generalized in other areas within Tribhuvan University. It can be also generalized social organizations and other social sectors. Thus, this helps to maintain quality standard of data.

Dependability: The idea of dependability emphasizes the need for the researcher to account for the ever-changing context within which research occurs. In my research, I collected data from different sources by using classroom observation guidelines and interview guidelines as research tools for the quality maintain of data.

Confirmality: Qualitative research tends to assume that each researcher brings a unique perspective to the study. In my research, I collect the data from different perspective of my participants“ interviews and from classroom observation. This helps to maintain reliability of data interpretation.

Triangulation: Triangulation is a method to get an accurate and reliable picture of situation. I tried to understand by collecting different kinds of information from different perspective, from different sources and with different tools. Here I used data triangulations where the data obtain from the class observation, interview with teachers and students. This helps to maintain quality and validity of qualitative data interpretation.

Prolong stay in the field. For collecting the data I stayed ten days in a field where the mathematics classroom observed. I took college from Pokhara valley where

the different social background students can be found. Interview was taken for few days and school documents (teaching method and materials) collected for few days. In the field which I saw and found those data were taken for research. That the reliability and validity of the data.

Data Collection Procedures

The data were collected through above mentioned tools from different respondents and sources were processed in different steps. The permission was taken from the administration of the selected Campus. Then I observed the classroom and interacted with the respondents informally before the class started. After then, I informed about the nature and purpose of my study and permission was taken before conducting the interview. Likewise, also the teachers approached informally during their leisure time. The interviews of selected students and teachers were taken within ten days. Their interview was record. The data from interviewed in the recorder transcribed in Nepali in note book. Then, that translated in English in computer. Separate files were created for each respondent.

Data Analysis Procedure

Miles and Huberman (1994) suggest that good qualitative data analysis has to be systematic and intensely discipline. For the purpose of analysis, the themes were analyzed for answering the research questions. The sentences under the themes were paraphrased or quoted as stated by individual participants. The important paraphrases with same meaning were brought together and summarized to support the argument whereas less relevant passages with same meaning were skipped for the case of analysis. Then after, with the help of theories the analyzed texts were interpreted and summarized. Thus, analysis of the statements from the specific themes were done and

theories were used to interpret the meanings, values, experiences, opinions and behavior of respondents from the analyzed themes and answer the research questions.

In this qualitative research I collected the data from the participants and display them for analyzing and interpreting. The data can be reduced during the interpreting and check their validity by using the different corresponding theories. It is qualitative as well as descriptive research, so there is no mathematical procedure to analyze the data. The collected information for this study was categorized according to the respondents and the different themes were given in the text of the interview and observation note. These themes were considered as a code. The similar code version of the respondents were collected together and explained in their perspectives. The data were analyzed and interpreted by using descriptive method with the help of literature review and the theoretical framework.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the various forms of equity that create discrimination between gender, ethnic, castes, mentally and physically disable in higher education. In this chapter, I have tried to address my research in three sections. The first section discussed about exploring the students perception of equity in mathematics classroom, second section discussed about the challenges faced by teachers to maintain equity in mathematics classroom and the third section discussed about the strategies for reducing the challenges to maintain equity in mathematics classroom.

Section 1: Students Perception of Equity in Mathematics Classroom

This section discussed about exploring the students perception on equity. The socio-cultural norms and practices have a huge impact on everyday forms of discriminations against women. Equity denotes justice for poor, exploited and oppressed people in all societies, and surrounds struggles of people everywhere who work for gender equality, intellectual protection and human rights (Panthi et al., 2018).

Here, I took an interview with five students. The interview was taken separately with each student at Prithvi Narayan Campus. The following themes were emerged on the basis of participants view.

Counselling

Counselling is a counselling service, this is a purely personal process. Counselling helps students solve their problems independently. The effect of counselling is that the individual develops his/her own abilities and self-confidence. It helps to develop the hidden talents in the person, to keep the person engaged in social behavior and to lead a satisfying life.

If a person is not normal in their behavior, they need counselling without advice. Counselling is a relatively simple and straight forward process, while counselling is a difficult and complex process. Counselling is the act of allowing the ordinary person to reach the goal, while counselling is the process of normalizing the abnormal person. It helps to providing information about psychotherapy, psychoanalysis, giving courage to the person, balancing the stimuli and solving problems. Counselling guides students guides students and helps bring equity to the classroom.

The need of Counselling

- It helps to alleviate anxiety and dilemma in a person
- Motivates for learning or building positive behavior
- It helps students adjust to the new environment
- It helps to create a positive atmosphere in the classroom (Adhikari, 2075)

In this regards, my students participant "S₅" share his view as,

Teacher need to council and motivate weak student for the upliftment of their mathematical knowledge. Every has a special problem teacher need to motivate students to be active and develop their positive towards mathematics

to make them able to tackle with different problem but our math teacher didn't it. Our teacher promote wrote learning and used traditional method"

(Interview, 21st Jan 2022)

Similarly, my student S₃ state that,

"I am a bachelor level student and I don't wake up to study my subject without getting advice on what to do tomorrow. Our teacher always focuses only on the subject" (Interview, 21st Jan 2022).

Thus, from the above opinion I concluded that teachers need to council and motivate weak students for the upliftment of their mathematical knowledge. I believe that counselling upgrades weak students to medium and medium to higher level of performance. Everyone has a special problem. Teachers need to motivate students to be active and develop their positive attitudes towards mathematics to make them able to tackle with different problems therefore, teacher need to counsel all students for maintaining equity mathematics classroom.

Learning Strategy

Learning strategies refers to a set of skills that student use to understand different tasks. This way, they are able to choose and effectively employ the appropriate technique to accomplish tasks or meet specific learning goals. These strategies range for techniques for improved memory to better study or test-taking strategies. There must be effective learning to increase equity in math classroom for effective learning, teacher need to adopt different learning strategies. In this regards my student "S₄" state that:

Teaching is the process of learning and teaching. When a math teacher teaches math, different procedure have to be followed in the classroom and a lot of time has to be spent. The teacher should adopt appropriate student centered methods and procedures according to the topic, otherwise it will be different for the student to understand. My teacher still use the explanatory method. Teaching is not effective when the old method takes its place rather than saying that mathematics is a difficult subject, you have to learn to solve mathematical problems in an excited way by adopting in methods, but my teacher should not make up to teach like that. Even when teaching the theorem of mathematics, it has become difficult to understand the fact that the prepared by the teacher has to be copied and written on the white board (Interview 19th Jan 2022).

Also S₃ State that:

Before teaching mathematics, the math teacher should adopt various strategies to alleviate the student's anxiety towards mathematics but. I think our teacher didn't that. In our classroom, it is very difficult to understand because teacher doesn't focused on how to teach in a fun way how to have a lasting memory of the student, only focus on how to pass in exam, she said that I need to clearly understand what teacher teach in their classroom. (Interview 19th Jan 2022).

The above argument show that the teacher has used to a limited method to teach mathematics. Not being able to teach mathematics in conjunction with other field different able student doesn't understand effectively and difficult to bring equity to the mathematics classroom. Learning strategies are ways learning within the

university system teacher are more important factor contributing to student achievement teachers who have mastered effectively approaches and strategies in teaching mathematics can help increase student's mathematical knowledge and improve math outcomes. So, math teacher need to use different strategies to maintaining equity in the classroom.

Fairness

In general, fairness is unbiased behavior to others with positive discrimination. In a classroom context, it refers to a situation in which teachers do not bias their students. That means, Students do not feel dominated by others in their classroom. In this regards, my students participant "S1" shares her view as,

Fairness refers to treating all students without any bias. But sometimes I feel unfair activity is doing in my classroom by some of the teachers during class time. I need to have equal chance with positive discrimination to learn mathematics. Some of activities that the teachers conduct in my classrooms are unfair. Teachers have to behave fairly to all students for making social just classroom (Interview, 19th, Jan, 2022).

The similar opinion is given by Student "S2" when she said; "I need to be treated positive discrimination. I need to clearly understand what teachers teach in their classroom. Classroom activities should be transparent positive discrimination and without biasness. In order to improve students' performances and develop our beliefs and confidence towards mathematics, teachers need to promote a good relation among students and expect good success rate for all students" (Interview, 19th Jan, 2022).

In this regard, Singh (2011) views that the equity as unbiased distribution of material and nonmaterial resources that are “beneficial and valued”. In other words, teachers need to provide equal opportunities to learners, if they focus on equity. Singh also highlights the necessity of equal participation of all students in teaching and learning.

Thus, from the above opinion I concluded that there are different categories to make teaching fair such as clarity in teaching, teachers’ confidence, transparent teaching, and focus on equity. I also argue that the teachers have to give equal importance but positive discrimination to all students in their classroom. I realize that fairness is to be free from biasness. My participants too have a common view that teachers need to teach their students without being biased positive discrimination provide material and non-material resources to their students without being biased. I think that it improves quality of teaching and learning and also student performance. This argument shows that fairness is being free from biasness and inequalities. Teachers have to give equal importance to all students in their classroom with positive discrimination

Linguistic

Mother tongue can often be referred to as our first language or native language. It is the language that we trust commonly speak. However, mother tongue is always referencing the language that the child has used from birth and in important and impacting in the child's life. The constitution of Nepal 2072 part 3 fundamental rights and duties article 31 right to education sub-article 5, every Nepali community living in Nepal shall have to right to acquire education in its mother tongue and the right to open and run schools and educational institution as provided for by law.

In this regards my student participant "S₁" state that:

Teacher should be not only a teacher he/she is also a helper and a guidance. Maths teacher should respect all language equally in the classroom. But our maths teacher cares a little less about the student who doesn't bite his tongue and doesn't understand. I have a problem understanding mathematics because I don't understand what sir said. It seems to me that the maths teacher didn't conduct in the class in such a way as to represent the students who speak all. The language while teaching mathematics (Interview, 18th Jan, 2022)

Similarly, my other students "S₃" state that:

I am a student of the Magar Community my tongue is different from other communities. When I read mathematics. I didn't understand many of the sign. Sometimes maths teacher seems to ignore a student who doesn't understand his language (Interview, 18th Jan 2020).

Thus, from the above opinion I concluded that they are students who speak many languages. Many student didn't understand mathematics because of the mother tongue is different. It seemed as if the teacher cared too much for the one who matched his mother tongue and cared less for the one who doesn't matched his mother tongue. Learning and understanding is a fundamental human birth right (Constitution of Nepal, 2072). So, learners need to create a learning environment in a simple and easy way to teach a teacher by addressing different mother tongue in the classroom is to provide so social justice. So, mother tongue adjustment is an importance issue to increase equity in the math classroom.

Caring Weak and Marginal Students

I perceive that equity also refers to caring low performer and socially and economically disadvantaged and marginalized students. So, teacher needs to care such students. I realize that caring and justice are two parts of the same coin. So, we cannot separate them. In this regard my student participant "S4" argued her views as,

Teachers need to focus on students, who are academically (in reading and writing), socially and economically weak and marginalized in their society with positive discrimination. Teachers should be providing extra classes, special treatment, counseling, and extra time to weak and marginalized students. In addition, teachers always support socially weak students for the improvement of their performance (interview, 23rd, Jan, 2022).

Similar response is given by student "S5"; economically and socially marginalized students are weak at studies. They do not want to ask questions about the topic. Teachers should be explaining to encourage them in the ways that they can ask questions and understand teaching contents (treatment on the basis of capacity) (Interview, 23rd, Jan, 2022).

In this regard, Adam (2015) views there are two primary ways to maintain relationship between morality of justice and morality of care: (1) the superiority approach: It describes that one ethic group is superior to others. In most cases, it is discussed in regard of justice. So, some people discuss it as a superior approach; (2) the integration approach: It seeks to find one monistic theory, in which care and justice are connected. The latter view is that justice cannot exist without care and vice versa. So care and justice cannot be separated. They are interrelated. In my opinion,

teachers need to give high priority to care each student in classroom (as cited in Panthi, 2016).

Thus, I concluded that the research focuses on 'morality of care' and 'morality of justice' by examining critical ethical issues. I have come to realize that equity is incomplete without care. Also, the teachers need to identify and respond to emotional and psychosocial needs of students. I mean, teachers should watch and care marginalized, disadvantaged, weak and slow students so that the performance of all students may increase. Weak and marginalized students need special care and treatment. Disadvantaged students need special care and extra time. Such kind of support has encouraged students to be regular in the classroom.

Social Process

I think that equity also includes socialization of classroom communities in which students and teacher cooperate to each other. It also refers to teachers and parents active participation and interaction to support students. Thus, it is sharing ideas and reflections to promote equity in classroom communities. In this regard, my student participant "S1" shares her view as:

Social process is the process of socialization in a classroom, in which all students are connected to one another. In classroom teaching and learning Teachers should include good and weak students, from different ethnic communities in a group and helps them to socialize themselves. Teachers should help to develop a good relation among the students in his class. (Interview, 18th Jan, 2022).

Similarly, my student participant "S3" shares her view as, Students cooperate with each other. We also use mathematics in our daily lives. We are engaged with different project works. When we work together, we support each other. All students participate actively and coordinate with each other when we are engaged with project works. This practice has helped to maintain equity in my classroom (Interview, 18th Jan, 2022).

Thus, I concluded that the teachers need to encourage students to think critically about any topic and to work on challenges. Students need to have enough opportunity to pose questions to their teachers when they do not understand subject matter. Also, students should be free to think, ask, explain and reflect on/about any problem of mathematics so that they can learn practical aspects of mathematics. Thus, a classroom should be seen as a community and a process of socialization in which they cooperate with each other.

To sum up, in this section, I explained students' perception of equity in mathematics classroom. I found that they perceived equity as counseling, learning strategy, linguistic, fairness, social process, caring weak and marginal students. Moreover, it has come with further meaning-making that students are expected to behave equally with expected to positive discrimination to the students and provide equal access with positive discrimination and opportunity to all of the students in classroom during class time. Likewise, girls are expected teachers need to teach lesson relating it to context. As shared by participants, teachers should care weak and marginalized students more. They should guide with positive discrimination to students. Teachers need to identify those students' weaknesses and treat them accordingly. Disadvantaged students need special care and extra time. However, there

are some challenges while teaching and learning mathematics in classroom. I have described the challenges faced by the teachers to maintain equity in mathematics classroom in the next section.

Section 2: Challenges Faced by the Teachers to Maintain Equity

This section discusses about the challenges faced by the teachers to maintain equity in mathematics classroom. It is not easier to take action as it is easier to say. It is challenging to act for equity in the school in teaching mathematics in culturally diverse classes. There are some challenges associated with teaching for equity. Here, socially aware educators may perceive classroom pedagogy as a threat to the status quo, and also rigid curriculum that has little or no real relation to learners lived experience outside their classroom (Acharya, 2072).

The biggest challenge faced by teachers is: how can they work effectively and equitably for all learners in ever more diverse classrooms. So as to address the research question 'how do teachers express the challenges of promoting equity in mathematics classroom?' "I have pointed out various challenges for promoting equity in our mathematics classroom. In doing so, I have generated different themes based on the three teachers" interview. Each of the themes is presented below.

Gender Gap

Gender is a set of features distinguishing between male and female, particularly in the cases of men and women. Depending on the situation, the discerning features vary from sex to social value to gender identity. Gender differences in mathematics performance and ability have been concerned and a lot research is carried out to address the under-representation of women at the highest

levels of mathematics, physical sciences and engineering. In this regard, teacher "B" states:

Gender gap is a challenge for maintaining equity in my classroom. I found from my experiences, in some classes females were more active than males .But most of the classes I found that male students were active than females. Teachers focus more on boys than on girls in mathematical activities. Some female students are a little more active and when more care is given to less active female students active female students feel boring. When caring more for male students, female students feel neglected and female have a negative impression on their mind. Thus, the gender discrimination is a challenge in classroom. (Interview, 5th Feb, 2022). Similarly, the teacher C said that, few male students are better than female students. Most female students are nearly at the same level of performance. The performance of boys and girls are slightly different (Interview, 6th Feb, 2022).

The above argument shows that gender gap creates inequity in classroom and gender difference on performance increases social injustice. So, Teachers have to try to reduce gender difference. They need to be gender friendly in terms of lesson planning, teaching methods, preparations of materials, language use, seating arrangements and classroom management as a strategy to maintain gender equity in their classroom.

Cultural Differences

Culture includes ethnicity, socio-economic status, language, geographic origin, learning manner and abilities, gender etc. It is challenging to change traditional

instructional techniques and adopt multicultural techniques for teaching and learning mathematics.

In this regard teacher "A" said, *“Cultural difference is one of the challenges for maintaining equity in classroom. Because of cultural diversity, they have different feelings. For instance, Muslim students worry when holidays are given to Hindus. The effect of this is reflected on their behaviors”*

(Interview, 5th Feb, 2022).

The similar response is given by teacher "B" as: *Different religions are challenges for equity. Students dominate each other on the basis of religion. Even teachers behave differently to their students. For instance, some teachers appreciate Hindu students consciously or subconsciously dominate Muslim students and others. That influences teaching and learning of mathematics (Interview, 5th Feb, 2022).*

Also teacher "C" shares the similar views as; *Cultural differences are existence in my classrooms. Students from different ethnic groups behave differently with their friends in their classroom. Some children from minority group hesitate to take part in different activities as they feel dominated by a certain group. So, the classroom environment is not good for learning mathematics (Interview 5th Feb, 2022).*

In this regard, Upadhyay et al., (2067) stated that school environment and the role of teachers are important; teachers need to be aware of diversity that exists in classroom and how socio-cultural factors affect academic performance of students. Teachers' perceptions and attitudes towards cultural diversity are crucial for student motivation towards learning.

From the above arguments I concluded that there are various cultures of students as there are different religious groups. Students of one religion slightly dominate students of other religion in classroom. Some teachers are also biased in terms of religion. However, I think, teachers should not bias students based on their cultural background and also encourage their students not to be biased to their friends. Therefore, it can be argued that cultural difference is one of the main challenges for maintaining equity in mathematics classroom.

Diverse Students

Since our mathematics classrooms are multicultural. So the issue of equity is always burning. Therefore, teachers need multicultural education. Teachers apply very hardly single way of instruction to different students. Nevertheless, it is a challenging issue for equity. In this regard, teacher "A" states:

Students are from various backgrounds such as cultural, economic, social, gender, geographical, academic, and non-academic. Further, they have different cultures and native languages. Teacher gives them different types of works but some of them mostly do not involve themselves in those works. Some of them are passive and noisy too. Some students sometimes tease their friends and disturb the whole class. Such diversity, it has been difficult to teach them equally. Therefore, it is one of the main challenges for promoting equity in mathematics classroom (Interview, 5th Feb, 2022).

The similar response is given by teacher "B" argued that:

I have students from various ethnic and language groups. Sometimes, I face problems when giving real life examples to students, but real life examples

may not be meaningful to other students with different background. When I use a term, some students get confused (Interview, 5th Feb, 2022).

In this regard, NCTM (2000) states that mathematics classroom is a place where all students should be stimulated to actively participate, share various ideas, and take part in problem solution. For this, it may need socially just instruction, which may require teachers to view mathematics education through equity perspective. I think, teachers should have knowledge and skills to reinforce students in classroom. Also, Panthi (2016) noted that “teachers should view students’ home cultures and languages as strengths upon which to build, rather than deficits for which to compensate.” (p. 3). This statement suggests for purposeful attempts of teachers to identify, grasp, and represent the lived experiences of students and their attempt to provide students with meaningful learning opportunities that may help to drive students towards success.

From above argument I concluded that “real life example” could maintain equity. In this diversity, same thing may have different meanings for diverse students. There are also low, good and average students in classroom. Due to all of these things, it is suitable way for teachers to maintaining equity in classroom. I think, teachers should have knowledge and skills to reinforce students in classroom

Insufficient Teaching Materials

I realized that there are not sufficient materials in mathematics classrooms. But, students conceive the idea from any lesson taught using material. Thus, it creates a problem in teaching. In this regard teacher "A" reported that;

Mathematics classrooms do not have enough materials. They have textbooks and some practice books only. Students want to use laptop and mobiles to learn mathematics but there is no laptop and mobile for classroom use. We also need to use overhead projector. But, most of the time we are using only textbook (Interview, 5th Feb, 2022).

Similarly the teacher "B" said, "There are insufficient overhead projectors, computers, and audio-video materials for classroom use. But, these materials are necessary for mathematics teaching" (Interview 5th Feb, 2022). Teacher C further adds, "The materials which are available at college they are unable to use topic- related materials in classroom. I do not even try to design materials (Interview 6th Feb, 2022).

From the above arguments, I argued that all the teacher participants report that there are not sufficient materials for classroom use. I feel that teachers are not serious about the construction and collection of materials. But, I think, materials are necessary for effective teaching.

Students' Absenteeism

Students' absenteeism is another great problem. When students are absent in classroom, they missed different topics and it is difficult for them to understand next topics. Absenteeism is disturbing students' performance, promotion, dignity, and job possibility. In this regards, teacher "A" stated that;

Students' irregularity in classroom, these students do not understand topics but I am compelled to move to another topic as I have to complete the course in time. I also take fine from the absent students so that they will be

discouraged from being absent in their classroom. I think that the regularity of students is increased day by day because of the fine (Interview, 5th Feb, 2022). Similarly the teacher "C" said, "Many of the students are frequently absent in school and also they avoid class even after coming to school. As a result, they are weak in mathematics including other subjects and this creates inequity in classroom" (Interview, 6th Feb, 2022).

From the above argument, I argued that student absenteeism is one of the major challenges in classroom. It is one of the problems for making equitable classroom. The irregular students feel difficult to understand topics and they are weak at mathematics. So, students absent have adverse effect in maintaining equity in classroom.

Different Interests of Students

I perceived that students have various interests in learning. They have different backgrounds and goals in their lives. They are interested in learning the things that is related to their goal. In this regards, teacher B reported,

Students have different interests such as some of them are interested in geometry; others are in algebra and rests are in arithmetic. Similarly, they have different interest in different subject areas. Some students do not have interest in mathematics reading and writing. They make a noise in classroom. The students, who want to do catering and as assistant in driving do not show any interest in their study. However, a few students, who want to study science in future, are good in mathematics (Interview, 5th Feb, 2022).

In other words, individuals are characterized by a more or less stable preference for a particular class of objects, topics, or learning tasks. Typically, individual interest is used as a predictor of academic performance. However, there is also research about advanced changes in interest, such as gender-specific shifts in interest for various topics across years in school and about the effects of people's situation-specific states of interest (Panthi, 2016).

Thus, I argued that students have various interests in different subject areas. They also have various future interests, which can be a cause of inequity in classroom. Similarly, not all students are equally good at mathematics, or have equal interest in mathematics. Therefore, student interest has been seen as a challenge for maintaining equity in mathematics classroom. The notion of interest plays a vital role in academic and psychological discussion of learning and development. The theory of interest was developed by Herbart at the beginning of the nineteenth century. Many researchers use a notion of individual interest as a feature of person.

Marginalized Students

The students who are socially, economically, academically and geographically backward, are marginalized students. These students need to be promoted. Most of the public schools in Nepal have such students. This has been a next challenge for promoting equity in classroom context. In this regard, teacher "B" stated that,

Marginalized have weak. Sometimes, they want to read and write mathematics, but they have no opportunity at home as most of them work in other's homes. Teacher need to focus on students, who are academically, socially and economically weak and marginalized student with positive

discriminant, teacher should be providing extra classes, special treatment counseling and extra time to weak and marginalize student but teacher should not be providing these service because of limited time and family situation. So, marginalized students are the major challenge for maintaining equity in mathematics classroom. Some challenge marginalized students are problematic in classroom. They are afraid of teacher as they have weak performance in classroom Being afraid of the teacher makes it difficult to understand the inner potential ability of marginalized students and maintaining equity in mathematics classroom. (Interview, 5th Feb, 2022).

In this regard, the Gutiérrez, (2008) focused on that examining the gaps between students has raised awareness for equity in education, but a great care is needed when focusing on achievement gaps. There can be a tendency toward "gap-gazing" (p. 358), Focusing on marginalized students as having somehow insufficient mathematical skills, instead of looking at this situation with a view to improving outcomes. Thus, the presence of the issues related to race, class, language and culture, and communities continue historically, which has been a challenge for promoting equity in classroom.

To sum up, in this section, I described the challenges of maintaining equity in mathematics classroom. The major challenges include: classroom diversity, students' absenteeism, inadequate prior knowledge of students, students' different interest (future and subjective interests), marginal students, non-participatory teaching, and gender gap of students, cultural differences as mathematics a difficult subject and insufficient teaching materials in schools. These aspects are perceived as hindrance

for equitable classroom. These are the emerging challenges maintaining equity mathematics classroom.

Non- participatory Teaching

I think that traditional teaching techniques are also challenges for promoting equity in classroom context. In this regard, teacher "B" said, *"I use board marker and emphasize more on teacher-centered techniques in teaching mathematics. Due to large number of students, it is not possible to make all students participate in different tasks"* (Interview 5th Feb, 2022).

Similarly the teacher "C" also stated that,

Teachers' habits of traditional teaching in classroom are challenges of equity. This sort of conventional teaching does not give opportunity to students to participate in different tasks .So, teachers need to be more active and encourage all students to participate in class activities (Interview, 6th Feb, 2022).

In this regard, National Research Council (2000) states that Conventional forms of mathematics instruction tend to focus on finding right answer and memorizing facts and procedures, but often leave students' unengaged and unprepared for difficult and innovative problem solving .

From above argument I argued that when teachers use a participatory teaching approach, students are motivated to learn mathematics. They are close with their teachers. They learn mathematics more. But, teachers cannot easily adopt participatory approach because of classroom problems. Teacher-centered technique (teacher is more active and students are passive) is one of the challenges of equity in

mathematics classroom. Our mathematics teachers use marker and talk in their classroom, which is a serious problem to maintain the linkage between learning mathematics and application of mathematics. The traditional forms of mathematics instruction focus on finding right answer and memorizing facts and procedures, but do not focus on engagement and innovative problem solving.

Section 3: Strategies for Reducing the Challenges of Maintaining Equity

This section discusses about the strategies to reduce the challenges of maintaining equity in mathematics classroom. National Council of Teachers of Mathematics NCTM (2000) has promoted a standard based approach to mathematics instruction and sketched the principal and standards for developing a comprehensive school mathematics program. Adams, Bell and Griffin (1997) have established five principles of equity in education and these principles support educators to: balance emotional and cognitive components of learning process, acknowledge and support personal experience, maintain social relations in classroom, utilize students' reflections and change as outcomes of learning process (pp.42-43)(cited in Upadhyay et al. 2067).

Given these notational contexts, I think that these principles are also useful for teachers for promoting equity in mathematics classroom. These provide wider guidelines to teachers for reducing inequity in their classroom. So, as to address the research question „what strategies do the teachers use for promoting equity in their classroom? "here, I have explored educators" participants "strategies for maintaining equity in mathematics classroom. Here, I have generated different themes based on the two teachers" interview. Each of the themes is presented below:

Linking Mathematics with Daily Life Context

The use of mathematics in everyday life includes the use of real examples in the universe. Generally, we say that mathematics is a practical subject. Thus, we need to design the curriculum according to the necessity of the culture of society. However, it is a challenging work. We connect mathematics with students' daily life activities. We do not impose theory and bookish knowledge into students as this does not sharpen students' mind. We need to make all students as creative worker. In this regard, my participant "A" states as,

The teacher "A" said that he found the connection between mathematics topics and students' daily life problem. He always gave them practical example. For instance, he teaches the topic of Bills and Discounts. He gives original bills and discussed about bills and discounts in classroom (Interview, 2nd April, 2019). In this regard, Garri & Appova (2012) state that an application of culturally relevant pedagogy, teaching for equity challenges teachers to build specific curriculum that supports students to understand their problems that occur in their communities.

Students enjoy a lot whenever teachers relate mathematical topics to their daily lives. I understand that mathematics should help to solve daily life problems of students. In my classroom, students raise many questions related to vector, such as why do we study vector? What is its usefulness in daily life? I tell one of the students to give him a pen. Then, I give real examples in my classroom. For instance, by using a pen, I tell them that there is a certain distance called magnitude and straight direction. It is used to find the distance between two planets. I feel that students enjoy learning when real life

examples are given to them. Such examples also help to make mathematics learning memorable (Interview, 20th Feb, 2022).

Similarly, teachers should relate mathematics with the cultures of students in which they perceive the notion of the subjects. If subject matter is related to students' daily lives and society, students may remember it for a long time. Therefore, teachers should value students' cultures. In acknowledging interaction between mathematics and human experience, we have to start to know how mathematics acts in society.

From this argument, I argued that this practice supports students to tackle with mathematics problems. Students' performance has slightly improved due to real life examples. I think, teachers have to link mathematics with students' daily lives. Students enjoy a lot whenever teachers teach mathematical topics and relate mathematics with students' daily lives. Students easily understand the concepts. Mathematics should be visible, behavior and practical in the daily life.

Group Work

From my point of view, it is good to organize group work in large class size.

In group work, students become more active in their classroom. It promotes the feeling of cooperation. Especially, marginalized and lower achieving students can learn more from their colleagues. They have good opportunities to express their knowledge in their group so that students develop their performance. In this regard, teacher, "A" states that:

Teachers need to divide all students into small groups with good balance of gender, caste, age and capacity and then students ask to do project work in

their classroom. Then there will be a good coordination within groups and among groups (Interview, 15th Feb, 2022).

From above I argued that the group work practice also improves the tackling capacity of students in mathematics. Similarly, teacher "B" also shares his view as, Not too easy to care all students individually. Therefore, teachers need to divide all students into small group mixing at least one good student in each group. In each group team leader teaches his/ her friends. Different students are clever and good at different things. So, share their knowledge with one other. Thus, group work brings uniformity and equity in learning. Teachers feel easy to teach when students are divided into different groups. Also, the students learn more from their group work. Thus the group work helps to develop confidence in students (interview 16th Feb, 2022).

In this regard, Kriflik & Mullan (2007) state that the aim of group work is to gain and build knowledge together. Solving problems in groups usually involves each individual in the group work and students provide feedback to each other. In a group work, students have more opportunities to express their thoughts and exhibits deeper mathematical concepts. Their own mathematical strategies can be improved because they are able to coordinate with their peers. During group work, students do not feel lonely and may feel less worried about practicing mathematics. The use of group work as cooperative learning technique positively supports student learning .Project focused group work can also develop social and personal skills. Additionally, other vocationally oriented group work skills may enhance learning provided that consideration is given to group size, formation, skills development and assessment strategies. Teaching and learning in small group has a valuable part to play in

classroom. It allows them to make meanings, to express themselves in language of the subject, and to establish a close relationship with academic staff.

From above, I conclude that the group work is suitable for large mathematics classroom. All of my participants have a common view that the teachers need to divide students into small groups; each of which contains good and weak students and each student shares his/her idea with other members in the group. Each student learns more from group work. Teacher is a facilitator in such groups. Group work develops personal and social skills in students. It also gradually promotes instrumental skills of listening, presenting consideration and persuading. It creates great learning opportunity to students and helps to gain and build mathematical knowledge.

Enjoyment

Teachers need to try to make joyful classroom environment. For this, they have to use different relevant materials. Also, they can teach mathematics contents using poems, songs, genre and drama where students enjoy a lot and conceive the notion of the subjects. Moving, touching things, laughing and telling stories are prime entry points for impartment skills and understandings. Teachers need to try to ensure both engagement and understanding for all learners in every lesson. In this regard, my participant teacher "C" shares his view as,

Teachers should not punish students but motivate and counsel them to learn mathematics in an enjoyable way. Also, give them work to use mathematics tool and explain its different aspects. In this way, students feel comfortable to study mathematics and they tend to learn more from real materials such as prism, cylinder, cube, parallelogram, circular ring etc. Similarly, teachers

sometimes teach mathematics with the help of poems and songs. Sometime, Students also compose poems in classroom and promote their ability (Interview, 1st April, 2019). Similarly, the teacher "B" shares the same views that teachers should teach some topics of mathematics through games and drama. Then students really understand the mathematics learning (Interview, 16th Feb, 2022).

In this regard, Sakiz, Pape and Hoy (2012) define intellectual enjoyment as a positive activating desire experienced when the engagement in a task is joyful, pleasant, and satisfying. In learning environments, I felt that lack of enjoyment leads to feelings of boredom accompanied by disengagement from activities. Teacher characteristics may affect students' emotional experiences. In a study involving elementary school students in Brunei, teacher proximity (e.g., closeness) was found to be positively associated with students' enjoyment in science classrooms.

From above, participants share common views thus from that I argue that when students understand mathematics, they can enjoy it. Enjoyment comes after understanding of mathematics. Teachers should teach some topics of mathematics such as profit and loss games through drama and games. I think that the curriculum of mathematics should be contextualized so that teachers can link it with students' real lives, which promotes meaningful understanding and students' happiness. The academic desire i.e. academic enjoyment and discouragement arise in social situation. Positive desire should be promoted and negative desires should be prevented.

Counseling

Counseling means understanding students' personal problems and offering them advice to solve the problems. I experience that counseling is also situational. That means teachers need to treat students according to their needs. I realize that skillful teachers can change their students' habits of learning mathematics with the help of counseling. It helps to promote the desire of learning mathematics. I think that, it is especially useful for weak and marginalized students for improving students' performance. I consider that it motivates students towards their subjects. It depends on teacher skills and ability. In this regard, teacher "C" states that;

Teachers need to council and motivate weak students for the upliftment of their mathematical knowledge. I believe that counseling upgrades weak students to medium and medium to higher level of performance. For example, a girl student, who does not have any attention towards learning mathematics in classroom, has shown her interest in mathematics after council ling. She has also gradually improved her knowledge. She is making a plan to do something in mathematics (interview, 15th Feb 2022).

The above argument shows that marginalized, disadvantaged and weak students need counseling for improving their performance. Also, motivate the students to learn mathematic. Similarly, the teacher "B" shares his view as;

Everyone has a special problem. Teachers need to motivate students to be active and develop their positive attitudes towards mathematics to make them able to tackle with different problem. Therefore, teachers need to counsel all students.

Teachers should be categorizing counseling into individual, group or clinical counseling. In individual counseling, motivation is given to individual students, who have special problem (economic, social, psychological) in learning mathematics but in group counseling, students with similar problems are counseled in a group. For example, at the time of earthquake, group counseling was given to reduce the tension of students. Teachers should be encouraging them to do different activities and try to divert their mind from the critical context. Teachers need to ask them not to be afraid of earthquake but to be aware of natural disaster. In clinical counseling; teachers should treat students whenever a problem arises. So, it can take place anytime and anywhere. It can be either in a group or in an individual level. Before counseling, teachers need to find out students' problems such as lack of time to study at home and economic problem (Interview, 15th Feb, 2022).

In this regard, equity counseling is a careful action for improving equity, access, participation in classroom, which supports for the enhancement of individual and circumstantial justice. The aim of equity is to eliminate the systems of oppression, inequity, inequality, or exploitation of marginalized populations and communities (Constantine et al., 2007). It should also be noted that awareness, knowledge and skills have been considered as the three necessary elements of service delivery models that give culturally appropriate counseling.

Further, multicultural training within academic programs have also blended these three elements into curriculum, pedagogy, and student evaluation. So teachers should follow this model while teaching mathematics for promoting equity in classroom (Panthi, 2016).

From the above argument, I argue that counseling is necessary for students to enhance their skills in mathematics and make conscious them to learn mathematics. Students need counseling for improving their performance. Teachers should use group counseling, individual and clinical counseling for developing mathematical knowledge to the students. Equity counseling is a careful action for promoting equity, access and participation of students. The three elements such as consciousness, knowledge and skills provide culturally responsive counseling.

Demonstration

I perceive that demonstrating relevant materials and non-relevant materials in classroom develops thinking capacity of students. The physical objects which students can see, touch and feel are real materials but non-materials are related with teachers' knowledge and activities. Teachers need to be confident, knowledgeable and skillful for classroom demonstration. They also should have necessary knowledge of modern technology, such as computer, overhead projector, smart board and so on. In this regard, my participant "A" shares his view as,

Teachers should show both materials and non-materials in classroom. And always demonstrate materials and explain the concepts with the help of those materials. Allow the students to touch and see the materials. For example, make paper cylinder and show its each component to the students. Then, students will be interested to touch the cylinder and guess its volume. When teacher use real materials, all students seem to enjoy the topic and show interest to learn the concept (Interview, 15th Feb, 2022).

The above argument shows that such activities help to improve creativity in students. When, students directly see and touch real objects and understand their features. Demonstration helps students to understand the concepts of mathematical terms. Similarly, the teachers "D" states that, He makes cone, cylinder, cube and triangular prism. His students also participate in making those objects. He demonstrates those objects while teaching related topics. Students see, touch and understand different components such as area of curved surface, volume and area of total surface of those objects. It helps students to understand the concepts (Interview, 16th Feb, 2022).

In this regard, Zhu (2013) views that the educators believe that good relationship between teachers and students are important in learning process. For example, when teachers demonstrate supportive and helpful interpersonal behaviors, students are more actively involved in learning, and they develop deep learning approaches. As teacher-student relationship is integral to learning process, it is important to equip mathematics teachers with relevant knowledge about interaction models between teachers and students (as cited in Panthi, 2016).

Thus, I concluded that from demonstration, students become capable and develop the habit to read, write and discuss mathematics. I think that students promote exposing powers and skills in their classroom. When teachers demonstrate supportive and helpful interpersonal behaviors, students are more actively involved in learning, and they develop deep learning approaches.

Encouragement

I feel that teachers always need to encourage their students in the classroom. They have to describe the importance of the topic and its application in the society.

They need to be always guiding students, if necessary. They also need to reinforce weak and backward students and motivate them to learning mathematics so that student performance is improved. In this regard, my participant teacher "B" states that,

Students should be motivated and encouraged towards learning. Motivation is necessary for uplifting marginalized and weak students. All working class students should be motivated towards learning. There are different ways to encourage students, such as putting students in a group, making a shy student the leader of a group, and counseling students. Teachers should encourage weak students in different ways such as, praises students saying "*good!, Syabas!, well done ! Etc. and also counsel them individually. Additionally, teachers reinforce and rewards good works of his students (Interview, 15th Feb, 2022).*

In this regards, Bolyan (2009) pointed that classroom instruction plays a great role to develop equity in mathematics classrooms. It may be rarely required to be stated that equity is complicated and debatable consideration and collection of practices in instruction. I consider that teacher should motivate students for reflective practice in classroom. The success of mathematics instruction relies on stimulating instructors to transform their beliefs (as cited in Panthi et al. 2018).

From the above views I, concluded that, this helps to improve the activities of marginalized students. Students enjoy a lot and develop deep interest and positive

attitudes toward mathematics. Teacher should motivate students for reflective practice in classroom.

To sum up, in this section, I, have explored different strategies that need to use the teachers to reduce the challenges to maintain equity in the classroom. They include: counseling, group work, linking mathematics to students' daily lives, enjoyment, demonstration and encouragement. These themes were generated from teacher narratives. These techniques seem to be helpful for reducing challenges to maintain equity in classroom. Such strategies are likely to give new and practical ways to understand the issues of equity in Mathematics classroom in Nepal. It is likely to orient mathematics teacher with ideas on student-teacher relationship in mathematics classroom so, as to make mathematics classroom more inclusive and justifiable.

CHAPTER V

FINDINGS, CONCLUSION AND IMPLICATIONS

This chapter is basically concerned in deriving some findings, conclusions and implication. After the analysis and interpretation of the data the following findings have been presented.

Findings

The findings of this study are presented below based on three sections.

Findings Related with the students' Perception of Equity in Mathematics Classroom In this section, findings related to the answer of the research question "how do students "perceive equity in mathematics classroom?" are with six central themes emerged from analysis of the linguistic, learning strategy, counseling, fairness, social process, caring students and marginalized students. These emerging themes help to make socially just classroom. Equity also refers to the practice of teaching mathematics focusing on real context.

Further, I have presented the following major findings:

- Teachers are found not using student centred method they mostly used lecture method.
- Teacher need to try establish an inclusive environment.
- Teachers should care weak (socially, economically and marginally), slow and disadvantaged students. It helps to make classroom equitable just.
- There is no protection for available teaching materials for further use.

- Our teachers need to teach mathematics based on social context. Also, teachers need to have contextual topics.
- Teacher need to try accommodate learning style and disabilities
- Student need to be awarded of religious holidays.
- Teachers need to try to provide equal chances and access to their students in mathematics classroom.
- Teachers also persuade students to be active in their classroom. There is a need to focus on practical mathematics rather than on theoretical one.

Findings Related with Challenges Faced by Teachers to Maintain Equity

In this section, findings are related to the answer of the research question "what are the challenges faced by the teachers to maintain equity in mathematics classroom?" From the answer of this question emerge some themes such as; diverse students, gender gap, cultural difference, insufficient teaching materials, non-participatory teaching, students' absenteeism, different interests of students, marginalized students. These are the hindrance challenges for equitable classroom.

These are also the emerging challenges for equitable mathematics classroom. Further, I have presented the following findings:

- It is arguably a challenging experiment to act for equity in a school.
- These emerging challenges create problem in the classroom teaching for equitable classroom.
- Some challenges need to face by the teacher for maintaining equity in mathematics classroom. They are diverse students, disengaged curriculum, large

number of students, student absenteeism, traditional teaching techniques which create problem in the classroom teaching for equitable classroom.

Findings Related with Strategies for Reducing Challenges of Maintain Equity

In this section, findings are related to the answer of the research question "what are the strategies of reducing the challenges to maintain equity in mathematics classroom?" From the answer of this question six themes are emerged such as; counseling, group work, enjoyment, linking mathematics with students daily life, demonstration and encouragement. Such strategies are needed to apply teachers for the improvement of equity in mathematics classroom. Further, I have presented the following major findings:

- Teachers need to manage minimum requirement to their students in classroom. They have to be confident and skillful in teaching mathematics. They need to associate teaching content with daily lives of students and their culture.
- Teacher and students always need to enjoy and be happy in classroom. Teachers need to be cooperative, helpful and facilitator. They need to have also friendly behavior with their students. They should give high priority for questioning in classroom.
- Strategies like counseling, group work, enjoyment, linking mathematics with students' daily life, demonstration and encouragement to give new and practical ways to understand the issues of equity in Mathematics classroom.
- It is likely to orient mathematics teacher with ideas on student-teacher relationship in mathematics classroom so as to make mathematics classroom more inclusive and justifiable.

Conclusion

From above it is concluded that, this qualitative interpretive study was addressed in three sections and conducted with five students, four mathematics teachers. I have found six key themes as counselling, linguistic, learning strategy, fairness, social process, and caring students from open-ended interview with students based on the interview guidelines (see appendix-2) that the students' perceptions of equity in mathematics classroom. I have also found from open-ended interview with teachers based on the interview guidelines (see appendix-3) that teachers should face many challenges to maintain equity in mathematics classroom. These are diverse students, students' absenteeism, and different interest of students, marginal students, non-participatory teaching, gender gap, cultural difference and insufficient materials. These are the hindrance for equitable classroom. These are the emerging challenges for equitable mathematics classroom.

Thus, the teachers need to apply different strategies which are emerged as themes from the open-ended interview based on the interview guidelines (see Appendix-4) with the teachers such as counseling, group work, linking mathematics on daily life, enjoyment, demonstration and encouragement to maintain equity in mathematics classroom. So, I feel that, teachers need to use different strategies to cope with the challenges, such as persuasion, giving extra time, watching and caring, individual treatment, promoting teacher regularity, encouraging students regularities, grouping, individual treatment, giving regular assignments for making equitable classroom.

Implications

Every study has implications in different sectors. The result of this study has two major implications which are as pedagogical implication and policy implication. Also, this study has implications for myself.

Pedagogical implications. The pedagogical implication focuses on practical application of socially just teaching and learning in mathematics classroom. This study has outlined the processes that enable transformation of classroom practices to other situations. I have presented the following pedagogical implications of this study which are as;

- It can enable teachers and students to generate relevant knowledge that is transferable to other classroom situations.
- It gives insights for transforming teaching methods, for reforming curriculum, and for promoting equity in classroom.
- It has highlighted how higher level mathematics teachers and students perceive equity.
- It also throws lights on the existing challenges for promoting equity in schools and wider society. The study has outlined processes that enable transformation of classroom practices to other situations.
- It has also highlights what strategies are used by teachers to cope with the challenges for promoting equity in mathematics classroom.
- The study also aware teachers about inequity in classroom.

This study is likely to bring awareness among teachers for making equitable just curriculum.

- It helps teachers to make cooperative, helpful, facilitator and friendly behave with their students.
- Teachers and students' perception of equity in terms of social process focuses on socialization of classroom communities, including good and weak students, cooperating and developing a good relation among the students in a class.
- It helps teachers to implement in the classroom by caring low performer and socially and economically disadvantaged and marginalized students.

Policy implications. The policy implication focuses on policy intervention for equity in mathematics classroom through appropriate action to reform

- Curricula, textbooks, and mode of teacher education. From the students' perception of equity the six themes (counselling, linguistic, learning strategy, fairness, caring weak and marginalized students and social process) and related interpretation highlight the benefits of equity in mathematics classroom. Further, I have presented the following policy implications:
- This study assists Mathematics teachers, education experts, curriculum planners, policy makers, and all stakeholders should understand the existing situation and practices of equity in mathematics classroom.
- It helps teachers to employ different strategies and try to establish themselves as socially just mathematics teacher/teacher educator.
- It gives insights for transforming curriculum and for promoting equity in classroom.
- It also sheds light on the maintaining equity in schools and wider society.
- It requires a broader political determination and that should be expressed through policy and actions from the government and other stakeholders.

- It helps in Mathematics curriculum reform according to equity orientation.
- The government motivates to pay special attention to the weak, marginal and disadvantaged students for uplifting their learning outcomes.
- The study also aware teachers about inequity in classroom. This study is likely to bring awareness among teachers for making socially just curriculum.

Implications for Myself. I learned so many things from my research. I clearly understood the notion of equity. It is a relative concept. I knew that teachers.

- Need to try to provide positive discrimination and access to their students in mathematics classroom. Further, I have presented the following implications for myself; It helps me to understand clearly the various meaning of equity as counselling, learning strategy, fairness and teaching in context.
- I have taken the idea from my study that teachers need to manage minimum requirement to their students in classroom.
- This study also helps me to know about the challenges for promoting equity in mathematics classroom. They are diverse students, large number of students, student absenteeism, traditional teaching techniques which create problem in the classroom teaching for equitable classroom.
- I perceive that teachers apply different techniques to reduce barriers and challenges of equities, such as giving extra time, watching and caring, individual treatment, encouraging students, giving regular assignments and promoting the use of mathematics lab.
- I also perceive that teachers need different teaching strategies as demonstration of materials and non-materials, counseling, group work, child friendly techniques and so on.
- I learn that there is a need to focus on practical mathematics rather than on theoretical one.

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APPENDIX I

Class Observation Guidelines

- Physical environment of the classroom
- Area where boys and girls are seated
- Participation of boys and girls in classroom
- Students' views in Mathematics
- Interest of learners
- Teaching learning process
- Equal opportunity to learn
- Nature of motivation, reward and punishment provided by teacher
- Any activities or behavior within classroom
- Use of teaching materials

APPENDIX II

Interview Guidelines for Students

- Classroom environment
- Favorite subject
- Views in Mathematics
- Self confidence
- Practice of learners
- Girls learning style
- Teaching strategies
- About equity
- Impact of culture
- Diversity within students' background (ethnic, gender, socio-economic condition, Physically and mentally disability)
- Nature of reward and punishment provided by teacher

APPENDIX III

Interview Guidelines for Teachers

- Teaching experience
- Teaching strategies of Mathematics
- Number of boys and girls in the class
- Students regularity in class
- Expectations for learning mathematics
- Questioning patterns
- Teacher Student interaction
- Interest of learners
- Social variable and girls' learning style
- Impact of culture
- Diversity within students' background (ethnic, gender, socio-economic condition, physically, geo-geographically, and mentally disability etc.)
- Teaching experience
- Teaching strategies of Mathematics
- Teacher Student interaction
- Social variable and girls' learning style
- Impact of culture
- Diversity within students' background (ethnic, gender, socio-economic condition, physically, geo-geographically, and mentally disability etc.)
- Equity related challenges
- Equity maintaining strategies