

**CHILD-FRIENDLY LEARNING ENVIRONMENT: PRACTICE IN  
MATHEMATICS CLASSROOM**

**A  
THESIS  
BY  
TANK PRASAD BHANDARI**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
MASTER DEGREE IN MATHEMATICS EDUCATION**

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शिक्षा शास्त्र केन्द्रीय विभाग  
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**LETTER OF CERTIFICATE**

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Prof. Dr. Bed Raj Acharya

Head of the Department

Date: 23 December, 2019



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**LETTER OF APPROVAL**

This thesis submitted by **Mr. Tank Prasad Bhandari** entitled on **Child-friendly Learning Environment: Practices in Mathematics Classroom** has been approved as for the partial fulfillment for the requirement of Master's Degree in Mathematics Education.

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**RECOMMENDATION FOR ACCEPTANCE**

This is to certify that **Mr. Tank Prasad Bhandari** has completed his thesis entitled **Child-friendly Learning Environment: Practices in Mathematics Classroom** under my supervision during the period prescribed by the rules and regulation of Tribhuvan University, Nepal. The study embodies the result of investigation conducting during the period of 2018-2019 under the Department of Mathematics Education, University Campus, Tribhuvan University, Kirtipur, Kathmandu. I recommend and forward his thesis to the Department of Mathematics Education to organize final viva-voce.

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(Supervisor)

Date:.....

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**DECLARATION**

I hereby declare that this thesis is my original work. It contains no material which has been accepted for the award of other degree in any institutions. To the best of my knowledge and belief, this thesis contains no material previously published by any authors due acknowledgement has been made.

.....

Mr. Tank Prasad Bhandari

6 February, 2020

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.....

Mr. Tank Prasad Bhandari

6 February, 2020

## **ABSTRACT**

This study was carried out with the objectives to analyze the existing mathematics classroom practice through child-friendly perspective and analyze teacher's perception towards child-friendly learning environment in mathematics classroom practices. This study used qualitative research design and case study approach where two mathematics teachers and twelve students of class eight of two different schools has been selected through purposive sampling procedure. Data collection procedure was carried out through in-depth interview, observation and focus group discussion. Data were analyzed inductively so as to use the results of the analysis on basis for subsequent data collection. From this study, it was found that existing mathematics classroom practice could not be conduct on demand of child-friendly environment. Theoretically, teachers have knowledge about child-friendly environment in mathematics classroom practices which concern student centered classroom practice and learning environment but unfortunately, it was not being implemented well in the actual mathematics classroom.

This research study has analyze the teacher's perception towards child-friendly learning environment in mathematics classroom such as physical facility and healthy environment, inclusiveness, learner centered pedagogy, establish equity and social justice, conducting cooperative and collaborative learning, gender sensitiveness and community involvement in mathematics classroom. All of these above factors in mathematics classroom practice little reach on the provision of child friendly learning environment in mathematics classroom practices. A noticeable observation there would be several factors in classroom where as the findings of this study will contribute to the knowledge based on the management of child-friendly learning environment in schools and may also inform policy maker.



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### **LIST OF ABBREVIATION AND ACRONYMS**

<b>BPEP</b>	- Basic and Primary Education Project.
<b>CFCE</b>	- Child Friendly Classroom Environment.
<b>EFA</b>	- Education for All.
<b>FGD</b>	- Focus Group Discussion.
<b>IE</b>	- Inclusive Education
<b>MDG</b>	- Millennium Development Goal.
<b>MOE</b>	- Ministry of Education.
<b>NESP</b>	- National Educational System Plan.
<b>NFCS</b>	- National Framework for Child Friendly School.
<b>SDG</b>	- Sustainable Development Goal.
<b>SSDP</b>	- School Sector Development Plan.
<b>SSRP</b>	- School Sector Reform Plan.
<b>TA</b>	- Teacher-A.
<b>TB</b>	- Teacher-B.
<b>UNESCO</b>	- United Nations Educational, Scientific and Cultural Organization.
<b>UNHRD</b>	- United Nation Human Rights Declaration.
<b>UNICEF</b>	- United Nations International Children's Emergency Fund.
<b>ZPD</b>	- Zone of Proximal Development.

## **Chapter-I**

### **INTRODUCTION**

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

Modern world is witnessing most revolutionary changes in science and technology. In general, education is lifelong process where the learning environment is one of the prominent aspects to provide effective education in school. The school is often regarded as an institution created by the society to perform important cultural functions associated with the education, in order for the school to achieve the goals, there should be a conducive child friendly environment where teaching and learning will take place. In a child friendly classroom environment (CFCE), the staffs are friendly to children, health and safety needs of the children are adequately met. This type of classroom recognize and promote the right of all learner irrespective of gender, religious and ethnic differences, family status, physical and mental abilities/disabilities.

A UNESCO (2001) report on child-friendly school stated here that a child friendly classroom ensures quality education and positive learning for the child. In Nepal child belongs to several environments such as the home, the school, the community and the large society. All these contribute significantly to the child's right to live develop and learn. As far as the acquisition of academic knowledge is concerned, it is the school and classroom environment which imposes a significant influence on the child. Brookover (1982) however said that the concept emphasizes the total learning environment where the child finds himself. This includes the norms, expectations of the total system and the pattern of grouping of pupils for teaching and learning. In any given situation the environment has a major role to play if effective development will take place.

Child friendly classroom itself must be organized for flexibility and openness. There will be space for students to engage in activities, both independently and in small groups. Students are free to move as they need to, as long as they remain on task. They are able to leave the classroom in order to go to the library, resource room, computer lab (Feldhusen, 1993). During the process of learning, the teachers act to guide the students to focus and help them in the discussion (Baker & Levya, 2003 as cited in BintiMaat & Zakaria, 2010). Several related document about child friendly learning environment motivated me, child friendly learning environment promote child seeking, child-centered pedagogy, gender-sensitive, inclusive, community-involved, proactive and healthy approaches to school as well as on classroom (Chabbott, 2004). This approach are intended to increase the learning effectiveness, efficiency, reach of education system and enable all children to realize themselves to learn.

A child friendly mathematics classroom provides high-quality mathematics education for all students. The environment of the classroom should be interesting, inviting for all students. It should display student works as well as other materials that show group of learner involved in mathematics activities and careers. The classroom arrangement should allow all members of the class to participate in mathematics activities regardless of their current achievement levels.

In my reflection a child cannot learn only at a classroom without proper managed environment. It's also true that the child does not learn only from the teacher. The collaborative, co-operative, child-centered pedagogy needs to be applied and engaged of learners in every classroom activities which all enhance child friendly learning environment in mathematics classroom. This type of mathematics classroom concern child centered, gender-sensitive, inclusive, community-involved, proactive

and healthy approaches to classroom. The policies about child-centered educational environment are being high light, Education for All (EFA) (2002) School Sector Reform Program (SSRP) (2009) and other educational institution asset that profile being implements well. In classroom instruction, there is such controversies and gap between theory and practice. In general mathematics considered as essential everywhere and every time, universal language whereas the way of teaching learning mathematics must be enjoyable, innovative, child centered as well as effective in life long process.

As a teacher, acceptance and understanding of child friendly is not an option but a necessity, for those who teach in schools. Most of the Nepalese school's environment is not conducive enough for the development of appropriate skills, knowledge, interests and attitude in individuals towards mathematics. It means, we still have a long way to go in the provision of a child-friendly classroom and school environment for our children. Although, government and UNICEF have been trying in the last decade to make the school environment child friendly, a visit to most public schools reveals that the situation still requires drastic solution. Finally, teaching learning process is taken place in the classroom whereas teacher is a moderator, who creates the child-friendly learning environment with addressing the interest, ability and need of the students. To develop mathematical logic, intuition of learner there should be fearless, collaborative, co-operative environment and discussion needed and is possible only from child friendly learning environment. On this respect, researcher highly affected and motivated to study this problem.

### **Statement of the Problem**

The classroom is not simply a place in which students learn academic lessons. It is a social context in which students learn social lessons such as friendship, cooperation

and appropriate behaviors. All this takes place provided a teacher has the capacity to attract the students by demonstrating care and making the classroom fun for young children (Lee, 2006). According to Edgington (1998) the starting point of making the classroom child friendly is to capture the interest of a child and then to sustain and extend it. This can lead to curiosity among the children for further learning. In a child friendly environment, the most important thing for teachers is viewing children as competent and strong rather than needy and weak.

SSRP (2009) has focused on access of free and compulsory education, increase the relevancy of education, social inclusion and equity issues continue to prevail as the major concern across all levels of education delivery, ensure equitable access to quality education through a rights-based approach and promotion of a child friendly environment in schools. Educational policies, family status, community, overall school environment, geo-geographical, economic status are internal and external factors are influencing in mathematic classroom where as creating child friendly environment encompasses central role in mathematics discipline as well as effective classroom environment.

The teacher in the classroom is very important in the child friendly aspect because they work directly with the children and such as make a lot of impact in their lives. Ukeje (1992) also noted that if the child is the center of educational system, the teacher is the pivot of the educational process. The processing takes place in the classroom settings. If the classroom environment is not child friendly, learning and teaching will not take place. It has however been observed by education stakeholder recently, that academic performance of Nepal's children is below standard. Also many children have low achievement in mathematics learning which mainly concerned about classroom environment.



### **Objectives of the Study**

The general objective of this study is to observe the present scenario of mathematics classroom practice in public schools of Dolakha district from child friendly perspective. The specific objectives of this study are as follows:

1. To analyze the existing mathematics classroom practice through child-friendly perspective in grade eight.
2. To analyze the teacher's perception towards child friendly learning environment in mathematics classroom in grade eight.

### **Research Questions**

The research question is valuable defense against the confusion and carrying the whole theme of research. It organizes, delimits, provides a framework and points to the data that will be needed (Punch, 2005). The researcher constructed following research questions:

1. How is the child friendly mathematics classroom environments conducted in public schools?
2. How do teacher perceive child friendly learning environment in mathematics classroom?

### **Rational of the Study**

In regard to the prevailing problems and need for their solution in instructional improvement the place of creating child friendly environment is new approach has become indispensable. In classroom discourse learner needs a child-friendly environment, teacher must be constructive as well as innovative to be friendly and promote intellectual development, child centered pedagogy, also create democratic child centered learning environment in mathematics classroom.

This study may be useful for the researcher to find out research gapping, analyze it in various dimension of thought. Similarly this study may be fruitful to the government, planners, policy makers and other stakeholders who are involving in the field of education in general. It may be influence in the field of teaching mathematics in specific since it will provide the current practice and teacher's perceptions about child friendly mathematics classroom environment. In this situation the study had the following in Implications.

- This study would help to manage child friendly learning environment in mathematics classroom of school.
- This study would help to create awareness to provide reasonable educational facilities within each school.
- This study helps to find the problem in teaching learning in mathematics classroom.
- It would provide new technique to the teacher in the classroom for motivating the students.
- This study may be fruitful to the government, planners, policy makers and other stakeholders who are involving in the field of education in general.

### **Delimitation of the Study**

This study has been conducted in Dolakha district is located in province no 3 of the Nepal with the concerns of how learner stay in mathematics classroom and how teacher perceive and practice child friendly learning environment. It is also recovering from the post-earthquake disaster whereas several classrooms affected by disaster and various kind of learners come to gain knowledge in school. The present study has following delimitations:

- This study was limited only in public school of Dolakha district.

- This study was limited to the mathematics classrooms of grade-8 of two different schools.
- This study was limited to the two mathematics teachers of two public schools.
- This study was limited in focus group discussion, in-depth interview and observation.
- This study was limited only in the subject of mathematics.

### **Operational Definition of the Key Terms**

**Child Friendly Environment:** Environment concerned child centered, gender-sensitive, inclusive, community-involved, proactive and healthy approaches to school as well as on classroom.

**Child-Centered Pedagogy:** The pedagogy which focuses the child in teaching learning process with addresses the various aspects of children as collaborative, cooperative, co-teaching learning and addresses all kind of diversity.

**Community Schools:** The school which are established in the community with the financial support of Government of Nepal.

**Basic School:** The school which has been conducted the grade one to eight in formal education.

**Resource:** The information that the informants have provided being based on the fact.

## **Chapter-II**

### **LITERATURE REVIEW**

Literature review is one important component of the study without which the study could not be completed. In order to make the study qualitative it is highly essential. It helps the researcher to find out the theoretical background of the study which further supports the completion of the study.

Singh (2006) "A collective body of works done by earlier scientists is technically called the literature". According to Pandit and Poudel(2012) review of the related literature is important part to conduct research which helps researcher for the formulation hypothesis, planning of research design and interpretation of the study.

#### **Empirical Literature Review**

During 1990, child is center of classroom. For many children, the school environment is harsh and uncaring one which can have detrimental effects on their mental health concerned learner's holistic development. According to UNICEF (2004) child friendly environment encourages particular creativity, self-esteem, social well-being. It becomes the locus for fulfilling many of the child's demands such as socio-cultural aspects, inclusiveness, collaboration, child protection, communication, co-operation, democratic learning environment. The engagement of teachers and students are also very important in a child friendly learning environment at mathematics classroom. Teachers must have to be friendly towards the children. Practitioners working with young children set the scene for the emotional environment that the children play in. It is important those teachers are able to represent a secure world in which children are encouraged to take risks knowing that they will be supported if necessary (Skinner, 2007).At national level ensuring that the SSDP is a core

document which is fully guided by the spirit of child friendly environment whereas Educational Principles and Policies of Nepal accordingly designed and implemented.

Horelli (1998) mentioned that the article "creating child-friendly environments". She had done research work in European countries and argued that, creating child-friendly environment with learner means a shift towards more ecological and socially supportive setting with opportunities for involvement of individual difference learners in classroom. There is huge gap between know-how of children, the organizational authorities and the teachers to respond in terms of environmental arrangements in classroom as well as in school. The preconditions for children's involvement in neighborhood improvement comprise, besides the appropriate tools for participation, adequate institutional arrangements with in school whereas teachers must have significant role in classroom teaching learning activities.

Murtaza (2011) writes in his article "Developing child friendly environment in early childhood education classrooms in Pakistan" and concluded that, in a developmentally appropriate child care environment children could enhanced their cognitive abilities as they are active participants in the development of their own intelligence. In order to do that, the environment must invite participation and offer a wide variety of choices. Children must be free to explore and discover, to hypothesize and experiment to increase their knowledge about the world around them. Each area in the classroom must include space for children to work comfortably and to have their materials close at hand whereas teacher had a prominent role in classroom as well as on school.

Olaleye (2015) mentioned that the article "creating child friendly school learning environment for Nigerian children". He had done research work and concluded that the environment of the school had partially conducive to teaching

learning activities. Also, concluded that the infrastructural facilities were not adequately provided. Also classroom environment were not friendly to children with disabilities. The classroom is a critical focus in the total school environment and has a powerful influence how well a child develops and learns. The classroom environments were less attractive to the children learning mathematics whereas the psychological environment which involves interaction between pupils and teachers was also conducive.

Polirstok (2015) mentioned that on the article "classroom management strategies for inclusive classroom". He described the classroom in the 21<sup>st</sup> century has by law become inclusive, typically comprised of general and special needs of students. Included students are those who present with mild to moderate learning and behavioral challenges. They add another layer of complexity to classroom management, requiring teachers to be highly structured, consistent and reinforcing. Teachers' fidelity to behavioral expectations that have been established for classroom is essential. Classroom management strategies are discussed with include changing the teacher's approval to disapproval ratio of behaviors, using selective ignoring, focusing on structure and routine, increasing student locus of control, de-escalating student aggression, hostility and limiting the use of punishment.

Acharya (2015) mentioned in his article "A study in inclusive mathematics classroom practice in Arghakhanchi district" and concluded that child friendly environment promote child seeking, child centered, gender sensitive, inclusive, community-involved, proactive and healthy approach in classroom whereas teacher has sufficient knowledge about child friendly environment but they lacked to implement in mathematics classroom practice because of several internal and external factors has been considering at mathematics classroom practice.

Nepali (2015) did a research "teaching learning environment in mathematics classroom of secondary level" and concluded that teacher are trained and have good confidence but they lacked in teaching learning process which could not focus the especially work like co-operative, collaborative, group work/discussion, interaction, project work and class work. These type of activities concerned child friendly learning environment whereas teacher less emphasized to manage properly effective learning environment in mathematics classroom.

Undiyaundeye (2016) mentioned an article "Creating a Child Friendly Environment as a Curriculum Model for Early Years Teaching" and he concluded that child friendly environment encourages teachers to enhance students learning. In this regards, students can share their views, interact, ask questions and give support to them. This environment assists students to improve their learning abilities and comprehension level. When this happens, teachers see students as integral part of the environment. More all so, teachers feel that a child friendly environment expands motivation and propel interest as well as positive attitudes. The teachers stressed that collaboration facilitate a child friendly environment as well as relating feedback, co-planning, co-teaching and discussion.

Pali (2018) did a research "Teacher's perception and practices of active learning in mathematics classroom". He did mixed research design and concluded that the teacher's had positive perception towards the active learning for mathematics learning in the classroom but in their real practices of active learning in Nepal is so weak. Teachers had positively inspired to create and monitor effective learning environment but in practice teacher were lacked to implement effectively.

### **Theoretical Literature Review**

The knowledge and information on theories, models related to students learning and approaches of teaching specific subject can be instrumental in enhancing the learning performance of the children through improved teaching learning situation. Despite the difference between psychologists, learning theorists, and educators about how learners learn? There are agreements on that some theories might be more applicable than others and it is the job of a teacher to explore ways on finding application of each learning theory for his/her students. Many learning theories reflect on the nature of intellectual development. Sensitive teacher always makes noble attempts to discuss theories about learning and apply to teaching learning in mathematics classroom. Child is center of the teaching and learning process in mathematics. Burns (1992) mentioned that not only is it important to know about the important to consider the content of the mathematics curriculum. It is important to know about where child learn or how to engage people actively participate in learning and effectively manage classroom environment. This leads to review theories.

### **Constructivism Theory**

According to Ernest (1996) constructivism comprises an educational paradigm, represented by theory of ontology, epistemology, methodology and pedagogy. The main tenets of constructivism are that learners actively construct and reconstruct knowledge out of their experience in the world. Which argue that learners are most likely to become intellectually engaged when they are working on personally meaningful activities and projects? Constructivism recognizes that learners can make connections with knowledge in many different ways. Constructionist learning environments encourage multiple learning styles and representations of knowledge.



According to constructivism, a learning environment is a place where learner may work together and support each other as they use variety of tools and information resources in their guided pursuit of learning goals and problem solving activities (Wilson, 1998). This theory concerned about teachers must remain vigilant to ensure that environment includes proper support, guidance, rich resources and tools. The job of teacher is to articulate models to creating supportive, nurturing learning environments where students are successful in attaining learning goals and teacher always have positive, innovative attitudes towards subject matter as well as classroom management. This theory is relevant for this study because it is teaching learning strategy and management which underpins effective education and relevant classroom practices.

Lev Vygotsky's social constructivism theory emphasizes the classroom environment as a facilitator of development and learning. He contends that human have the capacity to alter the environment for their own purposes. Vygotsky theory stresses the nitration of interpersonal, individual factor as the key to human development (Schunk, 2004). According to Dirscoll (2005), the zone of proximal development (ZPD) is the concept in which Vygotsky refers to the observation that children not able to do the task then they can do it with the help and finally children can do without scaffold.

In general this theory claims knowledge is physically, symbolically and socially constructed. The learners are actively involved in learning process, teaching-learning environment is democratic, student's activities are interactive and student centered, teacher plays role of facilitators and encompasses child friendly environment in classroom as well as out of classroom. Teacher who understands this theory can use it in classroom to help them understand the needs of those learners

with learning disabilities, so as to help the learners achieve their best in the teaching and learning situation. This theory has many implications for teaching and learning technique and strategies to make classroom environment effective as well as innovative.

### **Rational Theory of Piaget**

Psychological theory of rationalist accepts that learner learns through intuition, reasoning and creativity where the child friendly environment provides to foster their inborn abilities. According to Piaget social transmission is the collaboration and co-operation of person with other people and is quite important for the development of logic in child's mind (Bell, 1978). This theory concerned to foster learner's intellectual development and learner entered in classroom with their intellectual abilities and child friendly environment foster effective, better quality of education. The classroom is not just sitting out there waiting to be uncovered but gets progressively shaped and transformed through the child's personal experience which is only possible by creating child friendly environment.

The implication of this theory for this study is that, it offers an opportunity for the child to receive education in accordance with his/her developmental and environmental condition that will help low performing learning to perform better whereas teacher plays significant role in classroom teaching learning process and on school, thus teacher's attitudes must be positive to create innovative, meaningful, child friendly environment in mathematics classroom. Classroom is platform to exchange, transform and respecting their diversified behaviors whereas teacher is one source to promote it effectively and teachers' perception put noteworthy role.

### **Teachers Role in Child Friendly Mathematics Classroom Practice**

In general from constructivist perspective teacher is facilitator and help them to construct their own image of knowledge also postmodern perspective, teachers are made not born. Teacher are also guidance as a moral agent to change positive attitudes of human by creating child friendly learning environment and the role of regular mathematics classroom teacher is considerably altered (Mc. Kenie, 2010 cited by Nepali, 2015).

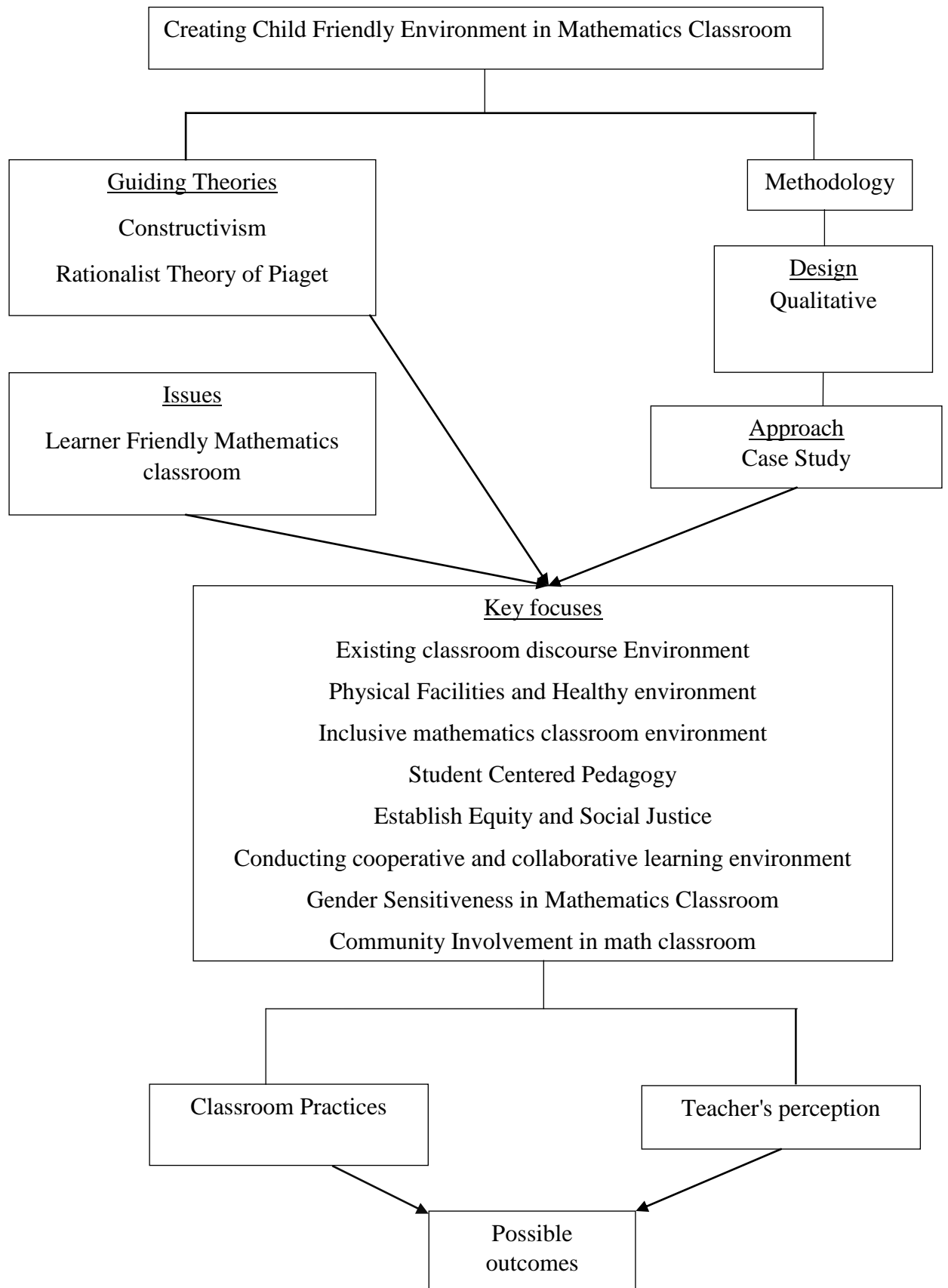
Teacher has a role model to promote critical thinking and creates an environment that is child friendly and encouraging all learners to develop their cognitive, affective, psychomotor and holistic development. Mathematics classroom in Nepalese context the teachers defined their role in terms of facilitator and facilitating involves creating rich environments and activities for linking new information to prior knowledge, providing opportunities for collaborative work and problem solving and offering learners a multiplicity of authentic learning tasks (Rathunde and Csikszentmihalye, 2005). According to Oswald (2007) teachers are at the forefront of the transformation of classroom to become more children friendly and in order for teachers to lead reform efforts and they need to be offered expanded and enriched professional development opportunities. It has been believed that, teachers with high self-efficiency beliefs are more likely creating and implementing didactic innovations in the classroom to use classroom management approaches and adequate teaching methods as well as child friendly environment.

In fact teacher plays the key role for creating child friendly learning environment in mathematics classroom with in the appointed precisely to teach the children according to their need and expectation, inclusive environment whereas

teachers must have curiosity, innovative attitudes towards teaching learning mathematics and create child friendly environment in classroom.

### **Conceptual Framework**

The conceptual framework is the basis of investigator's research problem. The conceptual framework indicates how the researcher conduct his research and that is shown in pictorial form. On the topic of **Child Friendly Learning Environment: Practices in Mathematics Classroom** indicated various approaches in classroom practice and influence effective, quality of education, relevant teaching learning process with address inclusiveness of learners in mathematics classroom practices. Also classroom arrangement, teacher leadership, healthy, safe, proactive environment, and active participation of children, families and communities also concerns about child friendly environment in mathematics classroom. For the sake of this study researcher concentrated only on the child friendly mathematics classroom environment.



**Fig 1: Conceptual framework of the study**

### **Filling the Gap**

Child friendly environment in classroom is a new approach. Very few research works have been carried out on the child friendly learning environment in mathematics classroom practices. I found many books, articles, and many previous research works. They have not discussed about this issue in Nepalese mathematics classroom. I found the gap between the reviewed literature and my topic of the study. Thus, to fulfill the gap researcher studied in this area. So I believed that my topic for this dissertation is suitable for carrying out a research.

### **Chapter-III**

#### **RESEARCH METHODOLOGY**

This chapter briefly describes the methods and procedures adopted by the researcher to carry out the research. Method is the guideline, which helps the researcher to research in a scientific and systematic way.

In this chapter design of the study, research cite, sample, sampling method, data collection, quality standards, data collection procedure and analysis procedure are included.

#### **Design of the Study**

This is the Qualitative research. The qualitative research concerned with social phenomena as they occur naturally. It emphasis on unique case orientation and aim at description, exploration and discovery using 'wide-angle' and 'deep-angle' lens approach to examine the breadth and depth of phenomenon (Koul, 2009).

This research based on qualitative research design. The design of the study was case study and thus the detail of case dug out from the study. This is explorative as well as descriptive research in nature. This study was focused in teaching child-friendly learning environment in mathematics classroom of public school of Dolakha district. According to Bell (1978) a case study is defined as a research method which investigated the conditions or status of person or group in the past and present and was designed to increase understanding as it exist in real life. It was descriptive because all the collected information for the child friendly learning environment in mathematics classroom practices in public school described according to the objectives of the study. It was explorative in nature because the study tried to explore the relation among the respondents such as teachers, students and classroom. It focused an exploration of case through detailed, in-depth involving multiple source of

information rich in context (Stake, 1995). It explore detailed, deep, systematic, interpretative studies that seek to answer questions 'how' and 'why' the beliefs, as well as comprehensive understanding of some complex issue in its real life context. It is concerned with phenomenon what exists, practice, prevails benefits, point of view that are held, processes that are going on, effects that are being felt or trends that are developing. Its major purpose is to tell: "How is" (Rezaviech, 1972). This data and information are collected through using the tools such as observation, interview and focus group discussion.

### **Research Cite**

Study is as were Dolakha district. It is one of the seventy seven districts of Nepal. Dolakha district covers an area of 2191sq.km. With a population nearly two lakhs (census, 2068). With the decision of Nepal's government to enter into the federal state this district has been partitioned into nine different autonomous local units. Study areas of this research were fall within Dolakha district and selected two schools of two teachers and twelve students. To study child friendly mathematics classroom practice were mainly guide by existing mathematics classroom practice and exploring the teacher's reflection, perception, experiences and nature of learners.

### **Respondents of the Study**

This is a qualitative inquiry. So the sample size in this study is small. Qualitative inquiry typically focus in-depth relatively small sample, even single case can be selected purposefully. So the sample size of this inquiry depends on the purpose of research and credibility of the study. On this behalf researcher were selected as two mathematics teachers and twelve students of grade eight of two public schools were considered as the sample selected purposefully which addressed the researcher's study.



### **Sampling Procedure**

Researcher was used purposive sampling technique to select the sample in the researcher's interest which help to run the study smoothly and complete as per plan. Researcher chooses the two mathematics teacher and twelve students of grade eight of two public schools of Dolakha district.

### **Tools for Data Collection**

The researcher used following tools of data collections.

### **In-depth Interview**

For collecting information and data with related topic the interview was conducted with mathematics teachers on the basis of interview schedule.

With the help of interview schedule the researcher find out the existing classroom environment with aspects of child friendliness. The interview with two mathematics teachers of basic public schools explore perceptions as well as their views, experiences about child friendly environment in mathematics classroom practice.

### **Focus Group Discussion**

In focus group discussion, participants were selected purposively and gather their own experiences, reflections towards phenomena. In focus group discussion twelve students were selected whereas six students were represented in each group of two public schools. After good rapport building discussion was began with semi-structured questions and answer. Every discussion was recorded on recorder. It tried to find out how existing mathematics has been practicing on the aspect of child friendliness. Learners expressed their views, experiences and after making the theme which all were incorporated with related theory and literature review.

### **Observations**

For the observation process the researcher visited on a study area and observed instructional activities, asked questions for respondent teacher, and students about child friendly environment in mathematics classroom practice.

### **Quality Standard**

The developed tools for qualitative data were validated by reviewing the supervisor and university experts. Then the valuable suggestions from above personnel were included and the tools of data collection were validated. Also these qualitative tools were validated by maintaining credibility, transferability, dependability and conformability process.

### **Credibility**

For the accuracy of research, researcher engaged in the field as prolonged, persistent observation triangulation, peer debriefing and analyzing data carefully considering negative cases (alternative/disconfirming cases) (Patton, 1990). Also thick description and member check had done.

### **Dependability**

This standard for judging qualitative studies and refers to stability of the inquiry processes used over time. It is emergent inquiry so the researcher needs to engage the field with an open mind considering emergence (Hammersley & Atkinson, 2007) as the process of learning more about the phenomena. Emergence does not limit in the field so research questions guided. Also researcher had presented the logic used for selecting people and events to observe, interview and included in the study.

### **Conformability**

Conformability refers to the quality of the results produced by an inquiry in terms of how they are supported by informants who are involved in the study and by

events that are independent of the inquirer. It also referred as audit trail which allows any observer to trace the course of the research step by step via the decisions made and procedures described. For conformability member checking, interpretation checking, debriefing had done.

### **Transferability**

Transferability replaces the concept of external validity. A research activity and its product can be transferred to another setting or context by identifying dissimilarities between researched and would be research site (Guba & Lincoln, 1989). This research has been providing rich details of pedagogical contexts, events and moments so that future researcher can use aspects of this research design to investigate similar research agendas.

### **Data Collection Procedure**

The researcher visited the selected school area where researcher had taken consent from the head teachers and built good rapport with the informants. Then researcher was conducted interview with mathematics teachers. The researcher would have interview manual with major guideline but in the case of unclearness, further explanation, also made and collected data on related phenomenon. In focus group discussion, the researcher conducted discussion with students after good rapport building and discussion episodes were recorded on recorder which has provided by the informants.

Furthermore, the researcher had one diary in order to keep record of the additional information which was shared by the information if any. Some observational information was captured in the diary note and camera. In the process of observation, the researcher was observed the present condition of mathematics classroom practices with aspect of child friendliness as well as scenario of

mathematics classroom practices of two classes of public school of grade eight and two mathematics teacher's and twelve student of each classes of six student for FDG.

### **Data Analysis Procedure**

The quality of any research work depends upon the set of tools or method of data collection and techniques used to analyze the data. Researchers observations, reflections experiences, encounters and conversations recorded on the diary were analyzed and kept the information of similar types in same place. Every recorded data provided by interview schedule, focus group discussion and observations were transcribed, coded, built a theme and triangulated, built theme with objectives, research questions and related literature reviews. After the triangulation of data, findings and conclusions were generated.

## **Chapter-IV**

### **DATA ANALYSIS AND INTERPRETATION**

This chapter presents the analysis and interpretation of the data which the researcher collected from the two different mathematics teachers and twelve students of grade eight of two public schools of Dolakha district. In order to analyze the collected data from the in-depth interview schedule, focus group discussion and observation, the researcher has used qualitative technique.

This chapter provides the layout of the research findings as well as the analysis of the findings in accordance with the two research objectives and the two research questions of the study. This chapter is divided into two sections. Section-I analyzes the existing mathematics classroom practices through child-friendly perspective in grade eight. Section-II analyzes the teacher's perceptions towards child-friendly learning environment in mathematics classroom in grade eight. The descriptive method was mainly used in these studies because the study analyzed and described the child-friendly learning environment in mathematics classroom of basic level. The collected information in this study was analyzed accordingly:

#### **Introduction of the schools**

The two public schools were selected from Dolakha district. The physical environment of the school speaks to the safe, clean, and comfortable surroundings which make positive school climate, where student can learn.

#### **Hilepani Sanskrit Secondary School**

The Hilepani Sanskrit secondary school established in 2031 B.S, at Kalinchok, Dolakha. There are five buildings and fifteen classrooms. There is a teacher staffroom and a head teacher room. There is library, one computer room with five computers.

There is a play ground surrounded by school buildings. There are three toilets, two toilets for student and one for school staff.

### **Bhagawati Basic School**

The Bhagawati Basic School established in 2038 B.S. at Kalinchok, Dolakha. There are three building and 9 classrooms. There is a teacher staffroom and a head teacher room. There is library and one computer room with two computers. The playground is surrounded by school buildings. There are three toilets, two toilets for student and one for teaching staff. There is two water tabs.

### **Section-I Analyze the Existing Mathematics Classroom Practices through Child-Friendly Perspective in Grade Eight.**

This section deals to achieve research objective "to analyze the existing mathematics classroom practices through child-friendly perspective in grade eight ". To fulfill this objective with the help of research question "how is the child friendly mathematics classroom environments conducted in public schools?" the researcher tried to incorporate different instructional practice through interacting with respondents. For this, researcher observed classroom, interviewed with teachers and conducted focus group discussion (FGD) with students whereas respondent teacher-A (TA) belonged from Hilepani Sanskrit Secondary school Kalinchok-4 and teacher-B (TB) had been teaching at Bhagawati Lower Secondary school at Ghyang and FGD-A of six student and FGD-B of six student were done respectively of public schools.

### **Mathematics Teaching Learning for All but Inappropriate Classroom**

#### **Arrangement**

In classroom, teaching learning mathematics is not only solving problems, there should be addressed to all learners who are coming from various backgrounds, different caste, religions, social and cultural variation as well as environments. Child-

friendly education is a philosophy which allows each student to feel respected, confident and safe so everyone can learn and develop their full academic potentials. According to UNESCO (2001), child-friendly classroom is a most effective means combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all.

In this regard teacher-A shared experience as,

*In classroom, various kinds of learners have been coming to study as multi cast, multi lingual, multicultural, multi ethnic, physically and mentally diverse etc. Mathematics learning activities were carried out in general classroom with fulfilling learners' needs individually as well as on group without any irrespective behaviors of learners.*

On the other hand teacher-B explained as,

*Classroom is full with mixed learners with various kinds of backgrounds such as Janajati, Dalit and Chettri-Brahmin communities, different abilities, so classroom has arranged as mixed sitting, group work done in mixed learners group. Classroom teaching learning activities begins in ability level not in disability level.*

From the teachers' views, it endeavored that teacher welcomed all kind of learner in classroom and teaching learning activities conducted like in general classroom. According to Vygotsky (1978), an effective teacher would always tried to bridge between theory and classroom practice. In Observation, it seemed that teacher always trying to create child-friendly classroom. In focus group discussion-A, students shared their views as,

*The main aim to come school is to gain knowledge, skills, behaviors with the help of teachers as well as collaboration to each other and self-directed. In*

*classroom we are belonged from different backgrounds and cultures as Magar, Newar, Dalit, Chettri, Brahman community as well as different abilities.*

On the other hand FGD-B explained as,

*In classroom no majority of any kind of communities so classroom practice has been conducting in mixed technique in group formation and any kind of mathematical activities. For the full participation, learners must pay charge for no attendance, no participation. In this way, our classroom looks like a one room-school house.*

From these views, it concluded that classroom teaching learning process had been conducting in child-friendly aspect and welcoming all kinds of learners as far as possible. But researcher observed,

*Classroom arrangement had less effective in child friendly learning environment aspect because of sitting arrangement were only square shape whereas U-shape may be effective, no any mathematical pictures, small mathematics lab and book rack available in classroom. Computer lab is there but which was not used in teaching learning mathematics.*

Finally it concluded that teachers were always trying to create child-friendly learning environment in mathematics classroom practice but classroom arrangement was inappropriate in Child-friendly perspective.

### **Less Equalization of Opportunities for all in Equity Approach in Classroom**

Equity addresses issues such as the elimination of barriers in classroom and supportive measures in working environments. It encompasses general notions of respect for diversity, inclusive curriculum, classroom and warming up the child friendly climate as well as some experience in educational settings (Ng, 2003).



According to Vygotsky, if learners cannot do the task then they can do it with the help and finally learner can do without scaffold (Dirscoll, 2005 as cited in Zungu, 2014). In this regard, teacher-A shared as,

*In classroom, learners enter with their own unique differences, needs and several variations to learn mathematics. To address their variations, I have been conducting various extracurricular and curricular activities in classroom such as math quiz, indoor games. Learners of Magar and Newar community were not actively participated because of tone of language as well as level of performance. After reducing variations by supporting in their level of thinking and making rules-regulations, every student has been participating actively in classroom activities. Students have provided opportunity to present their opinions in classroom as well as in bulletin board and opinion box.*

In other ways teacher-B expressed as,

*To form learners in ability level I use student centered approach, support and provide feedback individually as well as on group, treat slow learners with their individual level/difficulties. I have tried to provide space for talented learners and communicate with them in classroom, also encouraged slow learners to perform their creativity with routine of classroom. In my mathematics classroom, learners of Dalit community had little participation in activities but now they actively participated after providing support as well as equal opportunity with in equity approach in classroom.*

From these views, teachers provided equal opportunity in mathematics classroom with in equity approach by conducting extracurricular and curricular activities. Support slow learner who had linguistic problem as well as several difficulties. In order to focus group discussions (FGD) students expressed as,

*Mathematics is more logical and technical than other subject without help of teacher we cannot learn effectively. We feel linguistic problem while in verbal problem solving and at performing task related mathematical activities.*

*Teachers trying to support for all but focus only talented learners where as no discrimination in caste and cultural aspect.*

From the above informants' information, it concluded that teachers tried to promote equality by using equity approach but in classroom it observed that,

*Teachers only focused talented learners, they tried to provide equal opportunity in classroom but they lacked in implementation. Teachers tried to conduct activities but which had not appropriate to address individual difference and multicultural learners.*

Finally, it concluded that mathematics classroom discourse is little reach to the aspects of child friendly mathematics classroom environment. The Salamanca statement (1994) highly advocates an approach to education that focused on individual differences that may exist within classroom. In this way, mathematics classroom has little bit opposite.

### **Less Inclusive Mathematics Classroom Learning Environment**

An inclusive mathematics classroom provides high-quality mathematics education for all students. The inclusive classroom should be interesting, inviting for all learners whereas child friendly learning environment at classroom was concerned to maintain effectiveness of teaching learning, gender sensitiveness and healthy as well as safe environment, respect all kind of learners such as various castes, languages, culture as well as religions (NFC, 2010 cited Nepali, 2015). In Nepalese mathematics classroom, learners belong to multicultural where teacher maintained classroom as far possible (Acharya, 2017). In this regard, teacher-A expressed as,

*As a teacher, various kinds of student-centered methods have been practicing in my classroom and focus on using teaching materials as low cost and no cost. Every task in classroom has trying to generalize within learners' level of thinking, language, respecting cultural practice. Every mathematical activity has been practicing in democratic approach as well as focus on creating warm, happy, safe environment.*

On the other hand, teacher-B expressed as,

*In classroom every activities conducting with respecting cultural aspect, preventing any kind of harms and task provide to learner in collaborative, co-operative and group work as well as individually such as, find related materials in their home environment. I have been providing opportunity to exchange their knowledge, perform creativity in classroom and trying to promote properly.*

From the above views, it was concluded that teachers always tried to maintain child friendly/cultural friendly environment at classroom. According to constructivism, learning must be multiple representation of reality, support collaboration, group work, enable content and context dependent knowledge construction (Jonasgen, 1994 as cited in Acharya, 2017 p.70). In order to focus group discussion-A with students explained as,

*Teachers help to form group and provide task to do but we have no appropriate space for performing creativity on group as well as an individual and teachers provide feedback as in group because lack of time period which is less to learn and promote effectively in classroom.*

On the other hand, FGD-B students explained as,

*We agree, our teacher guiding and counseling us in teaching learning processes by himself as well as formed peer tutoring in classroom but it is not enough because he focuses on talented learners more and language of book only. In our classroom especially who belongs to Magar and Thami community feel uneasy to group work and classroom activities because of the tone of language. Teachers focus only language of book and provide example from book so learning become rote. In classroom, teachers help to formed group and provide task to solve problem such as find related geometrical materials in cultural aspect, on this time we share our cultural practice of knowledge and present each other as, is this like cylinder, cone, prism, and cube? And think how to find volume, area other many things.*

From the above view provided by informants, it was concluded that teachers have sufficient knowledge about inclusive classroom practice but it observed,

*Teachers had knowledge about how to address all learners in classroom but they lacked in implementation, teachers trying to address multilingualism but which is not enough, there were lack of community involvements in mathematics classroom. Teachers provided tasks to learners but they did not promote properly.*

According to Piaget theory, the interaction and co-operation of person with other people is quite important for the development of logic in child's mind (Schunk, 2004). However, teachers assist learners and provide/arrange a space to perform creativity in classroom, also emphasize to multi-dimensional thinking which is less effective because of the lack of resources. It exhibited that inclusive environment in classroom is less effective in child-friendly perspective.

### **Less Implement Student Centered Pedagogy**

Learner-centered pedagogy prioritizes students' individual processes of constructing personal knowledge and understanding rather than rote mastery of course content (Baeten et al., 2012). In this approach, instructors must be comfortable with the uncertainty and needed flexibility that come with self-reflection and change, both in them as well as with students. In this regard, teachers claimed as,

*We are aware and emphasize to use student-centered pedagogy which is effective and meaningful. In teaching learning process, we focus to use teaching materials, focusing in class work, students' creative thinking, conduct discussions as well as collaborative and co-operative learning in classroom. Also provide special opportunity for learners who need extra-support for improving their knowledge and skills with respecting their languages, cultural aspects, performance level.*

From the above teachers view, it was concluded that teacher had sufficient knowledge about student-centered pedagogy, managing child friendly learning environment and influencing to use it in mathematics classroom practice. In order to FGD, students claimed as,

*Teachers provide tasks individually as well as on group and some time we have done work in white board one by one as peer tutoring. Teachers less promote our creativity, in school math lab is not available and also we have lack of space to perform group work effectively in classroom.*

From the above teachers and students views, it was concluded that teachers were aware about child-centered pedagogy, managing learner friendly environment and trying to implement in classroom skillfully. But it observed that,

*Teachers were less trained, computer lab is available in school but they had not skills, how to incorporate in teaching learning mathematics. Teachers used teaching materials but explanation was less effective whereas they only use language of book, classroom arrangement, two way communications between teacher-students and students is insufficient, eye contact, group formation, discussion and so many activities were less effective.*

Finally, it was concluded that teachers lacked to implement learner friendly pedagogy in mathematics classroom.

### **Section-II Analyzes the Teacher's Perceptions towards Child-Friendly Learning Environment in Mathematics Classroom in Grade Eight.**

This section aims to give an exposition of the data about the teachers' perception child-friendly learning environment. To explore the teacher's perception towards child-friendly learning environment in mathematics classroom, researcher constructed research question " how do teacher perceive child friendly learning environment in mathematics classroom?" The researcher tried to incorporate the data from in-depth interview with teachers, observation and FGD in classroom activities. The researcher analyzed as follows.

#### **Physical Facilities and Healthy Environment on Mathematics Classroom**

The physical facilities and environment of the classroom is an important consideration in planning for effective instruction. The physical environment of classroom is directly related with the vision of country towards schools. The organization of classroom should foster of discovery, tools such as manipulative, need to be easily accessible to all students. Teacher should collection supplementary materials to use as resources for the teaching of mathematics. The physical environment has a significant influence on learning.

### **The Classroom Reality**

From different observed classes of grade eight of Hilepani Sanskrit Secondary School and the reality was presented as following:



The length of the classroom twelve meters and breadth was seven meter. The size of classroom like as rectangular. There were twenty eight desk and benches, the furniture were arranged in two column. There were four windows and two doors, two windows were fixed to be closed. The light of the classroom was good but there was no cupboard. There was a white board on the wall. The wall of classroom was cemented. The space of two benches and desks were narrow.

The physical environment of the mathematics classroom is mainly concerned with the ways like as classroom management and origination and rules, routines and expectations of the classrooms.

### **The Classroom Reality**

From different observed classes of grade eight of Bhagwati Basic School and the reality were presented as following:



The shape of classroom is square. There was available furniture arranged as in two columns. There were white board hanging on wall and also bulletin board hanging on near inside the door where students present their drawings but there were no math lab, projector and book rack in classroom. But in school there were small math lab, one computer lab, two projectors and library where students have access to use properly.

The management of physical environment of classroom mainly concerned with seating chart and classroom decoration. The physical environment of classroom is the child's learning which helps to promote effective learning (Rao & Kumar, 2005 as cited in Acharya, 2017). According to Reed (1991) classroom management encompasses efficient organization of material, seating plans and charts, keeping up-to-date grading system, effective instruction, being aware of the learners' needs and characters, assessing ones' work and performance, managing the students' behaviors and having positive attitudes. In this regard, respondent teacher-B expressed as,



*We have made bulletin board, student opinion box but it is difficult to manage/address learners' opinions, individual behaviors and their various kinds of intuitions in mathematics classroom.*

Learners' differences outlined their strengths, needs, goals, targets and all concerned about classroom culture which foster positive efforts as well as promote idea of learning as an enjoyable activity, engage in group work, peer tutor and so on. The Salamanca statement (1994) highly advocated in approach to education that focused on child needs that may exist within classroom, but in school it was farther than the provision of child-friendly environment in mathematics classroom. In order to teacher-A shared his view as,

*I have together with my students developed classroom rules on how to respect, helps each other, how to behave and identified different learning needs and difficulties of my students. I provide additional support while asking students to help each other but there is uneasy to follow it in classroom, school as well as in community because of involving various kinds of internal and external factors.*

Discipline is based on mutual respect. Rules existed to support the creation of a safe, secure, positive and child-friendly learning environment for all members of the school community. After the FGD and Observation, it can be concluded that classroom little reach to create acceptable behaviors and it is complex to incorporate every activities within learners' level.

### **Teachers Perception While Using Student Centered Pedagogy**

Student centered pedagogy always advocates interactive and co-operative learning where learners have prominent roles for whole teaching learning activities. Student-centered approach radically changes the structure of teaching environment in

terms of methodology and physical characteristics. In mathematics classroom, it was figured out that how to actively engage a community of diverse learners and provide entry points for each student, regardless of their prior academic preparation, current skill level and background. How do we partner with students to inspire them to be active and critical learner? It is challenging for every teacher to facilitate learners who belong to different cultural groups, ethnic groups and ability of students. On this behalf teachers expressed as,

*When started teaching as mathematics teachers we have a theoretical knowledge about student-centered pedagogy but practically it is so complex. In classroom various kinds of learners has been attending with their own intuition and language diversities so sometimes it is hard to divert learners to use mathematical language.*

From the above views, it showed that language was one layer to make classroom child-friendly. Vygotsky (1978) argued that human knowledge originates in socially meaningful activity and is shaped by language. Both FGD-A and B, recognized that learners felt uneasy to express their intuition because of language as well as level of thinking. It observed that there were no common language in classroom and teacher trying to explain in multiple languages as far as possible. In other hand,

*In teaching learning process, we form a small group and encourage individuals to work together for solving problem as well as specific content whereas talented learners solve and respond faster than slow/weak. We have ones provided special opportunity for learners who need extra-support for improving their knowledge and skills but a large number of learners with different background make uneasy. Mostly to address co-operative learning,*

*learners solve task problem one by one in white board. Teaching material is one essential factor for effective teaching learning activities. We use appropriate materials with rejecting learner's cognitive, affective, psychological facts. Computer is available but how to integrate and manipulate in teaching learning appropriately is complex*

In classroom, students may know the formula but fail to apply it whereas assistance of knowledgeable teachers or capable peers, the students learn to apply the formula. The researcher observed that, group work as well as peer teaching encouraged learners in learning process but only talented learners participated more, teacher must have assisted learners' individual differences. Teaching aids are any things invisible, visible or both which help students to understand quickly and accurately (Acharya, 2016). Also it helps learning to make efficient use of the resources in order to facilitate self-discovery. In reality choosing appropriate teaching aids with respecting learners' various facts is complex.

As a researcher, observed that teachers were unaware about using ICT in teaching learning whereas ICT model may provide prosperous teaching learning mathematics. In this issue, Acharya (2017) claimed that the effective use of ICT resources enhance creativity, problem solving, higher order thinking, skills and reasoning. It concluded that teacher trying to use proper methods of teaching learning activities, materials on the basis of learners' level of thinking and knowledge but they are far from the use of effective, modern as well as scientific methodology and materials.

### **Establish Equity and Social Justice in Classroom Teaching Learning Process**

Equity approach means in which different levels and types of opportunities that make social justice in classroom teaching learning process. This approach helps

students from racial, ethnic, gender, language and cultural groups for producing knowledge, skills and attitude needed to function themselves effectively (Banks, 2004). It emancipates the diversified classroom where each student from different groups can realize the access of optimum opportunities for fostering their learning abilities. In this regard, respondent teachers-A expressed as,

*As a rules and regulation of classroom, every Friday I have been organizing extra-curricular activities (math quiz, group work, problem solving, creative work etc.) to encourage individuals and provide equal opportunity in learning whereas weak, learners of marginal communities has low performance. How to labeled the gap, create equality in classroom is complex situation.*

Teachers tried to keep justice in mathematics classroom, but FGD and observation recognized that successful implementation of the social justice principles was the constraints imposed on them by the educational system. Because of the large amount of content that was required to be covered in a limited amount of time, the teachers felt that they often found it difficult to find time to incorporate the ideas of social justice principles effectively.

### **Conducting Cooperative and Collaborative Learning in Mathematics Classroom**

Co-operative and collaborative learning needs group works. In group, learners are encouraged to explore possibilities of task, invent alternatives, collaborate with teachers-students, students-students and finally present the best solution as well as all are successful. Johnson and Johnson (1989) note that the active exchange of ideas among the learners with in small groups not only increases interest of learner but also promotes critical thinking (as cited in Acharya, 2017). On this, respondent teachers A and B outlined as,

*In classroom, some groups have formed homogeneous learners with their interest and some not. So I have to spend much time for group without homogeneous learners and convince them. As a result, group of mix learner present their creativity as much better.*

In order to focus group discussion-A and B students expressed as,

*In classroom, sometime group formed on our interest and sometime group formed without interest whereas it is difficult to reach in best solution because of we have not same level of thought and various differences but feel innovative after the teacher's guidance and suggestions.*

From above information's and researcher's observation, it has concluded that weak, normal, talent, girls, culturally diverse group of learner were in classroom whereas teachers tried to promote group work but which was not appropriate in child-friendly aspect. Teachers had been focusing on the group of talented learner and group of talented learners respond fast and more whereas teachers trying to attend all learners and groups but they lacked.

### **Preventing Prejudice Behaviors and Gender Sensitiveness**

In classroom, interaction between teachers-students, students-students only possible if there is approvable behavior (Polirstok, 2015). It was concerned to inclusion, child friendliness and all actively participates in teaching learning process at classroom while there must be non-discriminatory and same level of behaviors required. In this regard, respondent teachers shared their experiences as,

*Classroom is small society of communities so it reflects image of society. Sometimes boys ignore gender-sensitiveness, also learners of communities speak unusual words to another so we have been focusing to provide moral education, make rules and regulation, civic responsibilities, talk about all of*

*learners' feeling and attitudes but it is difficult to control such type of behaviors in classroom whereas learning activities are unscripted.*

This view was concerned about preventing prejudice behaviors and gender sensitiveness in classroom as well as in school whereas teachers must be sensitive about the experiences, beliefs, mathematical knowledge, communication skills and mathematical cultures of learners. It is essential to discuss the necessary course works, tests and other preparation with learners and parents. Variety of learning options are essential for safe, active, group work, innovative learning and listens learners concerns, fears, experiences in classroom for inclusive classroom practice (Cropper, 1998) whereas focus group discussion and researcher's observation reflected, teachers trying to prevent prejudice behavior and making classroom gender sensitiveness but they had lacked at classroom activities as well as in schools.

### **Community Involvement in Mathematics Classroom**

Community involvement helps teacher to aware about socialization process, socio-mathematical knowledge, make meaning in multiple approach, relevancy of knowledge and treat learners as suitable in classroom with respecting their backgrounds, diversities. In this regard, teachers-A claimed as,

*In community, illiterate parents are busy in their house work, also literate parents are busy in their jobs and others have their own. Some parents who belong to lower caste have conservative thoughts and behaviors, so it is hard to involve community in classroom and to address children's individual backgrounds.*

In other hand, focus group discussion with students precise, students who belong to poor families involved mostly in house work and other activities. Also students belong to lower caste expressed; parents' ignored the learners' performance

and educational activities. From the above views and observation endeavored that community involvement in classroom was less which opposed provision of child-friendly environment. In order to teachers-B precise as,

*Every learner says that math is so complex but mathematical knowledge is applicable in everyday life. Social practice reflecting mathematical knowledge such as Doko, Daalo, Sooli, Naanglo etc. In classroom, only teach definition and solve related problem according to the curriculum so I think learners feel boring, also assessment system is not systematic because examination system is paper pencil test format. It is difficult to incorporate curriculum and assessment system with local context.*

This view and observation underpinned relevancy of curriculum as well as assessment system is inappropriate in classroom teaching learning process. In FGD, students claimed if curriculum materials are concerned with our language, context then we would perform better. It was concluded that mathematics curriculum must be modified/improved as learner-cultural friendly as well as continuous, problem solving, performance based on assessments encourage learners actively participate in classroom, reconstruct multiple meaning of learning whereas teachers, administrators, stakeholders were lacked and raised as the biggest challenges.

## **Chapter-V**

### **CONCLUSIONS AND IMPLICATIONS**

This chapter has captured the major findings of the research which the researcher has conducted with having defined objectives. After the data analysis what the researcher has found in connection with the objectives predetermined. Conclusion was described from the result of findings. This chapter closes with implication of research. An implication of the study is given for the area where the study can be applied.

#### **Major Findings of the Study**

The findings of this study were drawn from the analysis and interpretation of data as following:

#### **Existing Child-friendly Learning Environment in Mathematics Classroom**

##### **Discourse**

- Mathematics classroom practices are not being developed according to the demand of provisions of child-friendliness.
- The physical arrangement of classroom is not appropriate in terms of diverse group of learners and inclusive aspect.
- Teacher had a sufficient theoretical knowledge about instructional methods, pedagogies and techniques of addressing individual difference but they lacked to use learner centered pedagogy and child friendly situation in mathematics classroom.
- Less equalization of opportunities for all in equity approach in mathematics classroom.
- In classroom observation, there were lacked to maintain child-friendly and students' culture friendly environment.



- Teacher had less addressed learner friendly communication in classroom. Teacher just used languages Nepali, English and only of Book.
- Teachers used instructional material and explanation but they promote less.
- In FDG students concluded that there was a lack of resources to promote creativity and teachers less emphasis on it.
- I found through classroom observation, teachers were trying to create child-friendly environment in the classroom effectively. Child centered pedagogy was being discussed in the academic field, at policy making but not meaningfully implemented in classroom.

#### **Teacher's Perception about Child-friendly Mathematics Classroom**

- Furniture's and teaching materials were not properly managed to make the learning environment child friendly.
- Physical environment like heat, light, ventilation and setting arrangement were not properly managed in the sampled schools in order to make students active external noise levels less interfere with learning in the classroom. There was not sufficient space and ease up movement for all students.
- Teachers were trying to deliver mathematical content with using child centered pedagogy but they lacked to implement and promote properly in classroom practice.
- Teachers familiar about social justice as equity and equality, but slow learners have get less opportunities in mathematical activities such as quiz, games, extra-curricular activities.
- In classroom, there were conducting cooperative and collaborative learning whereas teacher's focuses on group of talented learner and only talented learner respond fast.

- In classroom, everyone aware about moral values, rules and regulations and their responsibilities but they were lacked in implementations.
- Community involvement in mathematics classroom is as little and also integrating curriculum as learner friendly.

### **Conclusions**

Fundamentally, managing child-friendly classroom is about social, intellectual change in education that requires deep and critical thinking. The classroom is full with diverse group of learners as well as their unique characteristics and it is challenging to include, itself must be organized for flexibility, openness. The pedagogy which the teachers use to teach students should be made learner friendly. Through the child friendly environment students have the chance to socialize and promote themselves.

Child friendly environment mainstreamed of all kinds of learners on their right of education. This kind of classroom environment extremely focused on meaningful, long lasting, innovative, child centered teaching learning process as one room school house classroom environment. On the basis of observation, focus group discussion and in-depth interview, it exhibited that there is gap between theory and practice of child-friendly mathematics classroom. Mathematics classrooms were not well managed, group work, co-operative learning and collaborative learning were not held appropriately. Teachers were trying to manage school environment, address diversities, socio-mathematical knowledge but they had lacked. According to Vygotsky (1978) the learning process should be based on the students' engagement in an activity where the teachers are directors of the social environment in the classroom but this study revealed that existing mathematics classroom practice has been little bit opposite. In general, preferred as an effective mathematics classroom only possible, if there is inclusiveness but there is a big gap between perceptions and its

implementation in classroom practices. There were several factors in classroom to address diversities, such as cultural, inter-personal, innovation on mathematics and create classroom safe, proactive, democratic, innovative, child-friendly environment. Teachers, stakeholders faced challenges, such as learner friendly communication, relevancy and contextualization of mathematical knowledge, address individual differences, promote social justice and prevent prejudice behaviors and community involvement in classroom etc. these factors little consistent with the work of Polirstok (2015), as creating a reinforcing classroom environment, using selective ignoring, focusing structure and routine, limiting the use of punishment are the main concerns of mathematics classroom practice in 21st century. Organizations, administration and stakeholders must be aware with above factors for effective teaching learning and improve policy. Teacher professional development program, curriculum relevancy, community involvement and child friendly environment in classroom are the remarkable concerns.

### **Implications**

Child friendly environment in mathematics classroom is an approach to develop quality of education and concerned about classroom teaching learning process which is effective environment and learner centered. This ideology welcoming all kinds of learner in classroom with respecting their individual differences, diversities, gender sensitiveness, context of community, making classroom environment safe, active participation, collaborative learning and co-operative learning. This study would contribute for making classroom effective, innovative, reduce challenges of teacher, stakeholders, responsible agencies and promote critically in classroom as well as in schools. Analysis, findings and conclusion of this study has made the following implications.

### **Pedagogical Implications of This Study**

- This research is concentrated to create classroom child-friendly and pedagogy be child centered.
- It is helpful for teachers, students and administrators to manage mathematics classroom properly child friendliness.
- It is helpful for every teacher to address various diversities in classroom and to apply child friendly teaching learning activities.
- The teacher should be responsive to accommodate students from diverse community at classroom.
- It is helpful to enhance strategies like co-operative learning, social constructivist approach, proper reinforcement, collaborative learning in mathematics classroom.

### **Implications for Policy Makers**

- To develop the curriculum by thinking about child- friendly classroom.
- Extend inclusion and fruitful environment to the community.
- It is helpful for teacher's professional development concerned about relevancy of context and socio-mathematical knowledge with respect various kinds of diversities.
- Conduct comprehensive, methodologically-sound research to reduce challenges in mathematics classroom.
- Enable stakeholders to develop positive attitudes towards child friendly mathematics classroom and its effective implementations.

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## **Appendix I**

### **In-depth Interview with Mathematics Teacher**

Teacher's Name...

School's Name...

Date...

Interviewer...

### **Analyze Child-friendly Learning Environment Mathematics Classroom**

#### **Practices**

- How do you agree to say your mathematics classroom learning environment through child-friendly perspective?
- Almost all students should start in general classroom. How do you welcome all kind of learner's especially from different cultural backgrounds and maintained one-room school house?
- IE reflects democratic classroom, how do you conduct it in child-friendly aspect?
- Do you use student centered pedagogy and how do you maintained interactive and co-operative teaching learning activities?
- How do you manage child-friendly environment at classroom?
- Do you use teaching material? How is your experience when you were using teaching material in child-friendly classroom?
- How is your classroom physical management? Is your mathematics classroom look like child-friendly? If so how?
- How do you control irrelevant issues in mathematics classroom in child-friendly perspective?

#### **Teacher Perception in Child-friendly Mathematics Classroom**

- Have you received any training from the local education department or other agencies on about child-friendly mathematics classroom practice?

- What's your experience and perception while addressing individual difference in mathematics classroom with child-friendly aspect?
- How much caste and religious students attained in your class? And what are the challenges to maintain classroom democratic, interactive, collaborative, co-operative as well as one-room school house environment?
- Do you feel difficulties while using student centered teaching learning process? How?
- Do you face challenges (communication, collaboration, exchange creativity etc.) while using a teaching material and how do you generalize against learners on classroom?
- Do you feel challenges while addressing different kind of learners according to their needs and knowledge while in teaching learning process with child-friendly perspective?
- How do you provide equal opportunities, prevent prejudice behaviors and justice in mathematics classroom? Is there challenges?
- Do you use teaching materials? There is difficulties while choose appropriate teaching material against multicultural learner?
- Is our curriculum relevant towards learner's level?
- Is our assessment system appropriate properly and promote holistic concerns of individual's?

**Thank You so Much!**

## **Appendix II**

### **Focus Group Discussion**

School Name:...

Date:....

- Are you all feeling your mathematics classroom look-like one-room school house?
- Do you agree to say your teacher fulfill your needs, provides equal opportunity in teaching learning process? How?
- How do your teacher support individually and in a group activities?
- Are you feel difficulties in classroom as communication, group work, collaboration, co-operative learning? How?
- How do you exchange your intuition, cultural mathematical knowledge in teaching learning? Do your teachers promote it?
- Do you feel any discrimination in classroom, school as well as in teaching learning process? How?
- How do your teachers help you when you are in difficulties? Do your teachers address diversity?
- Are you all participating to make rules and regulation in classroom and strongly follow it?
- What are the ways to maintain co-operative, collaborative, democratic learning environment in mathematics classroom?
- Is teacher encouraged to control irrelevant issues and prejudice behaviors in mathematics classroom practice?

**Thank You so Much!**

## Appendix III

### Indicators/Classroom Observation Protocols

<b>Classroom Activities</b>
Multi cast, multi religious and multi lingual learners are in mathematics classroom
Respecting diversity
Classroom decorated with mathematical pictures, symbols, charts and illustrations
Space for learners for group activities
Space for learner to read individually
The school and classroom manage for all kind of learners
Space for presenting teaching materials
<b>Teachers Activities</b>
Provide equal opportunities with equity perspective
Supports, feedbacks and punishments for learners
Interaction/communication with respecting diversities
Promote learners creativity
Use of instructional materials
Teacher's presentation (clarity, moving around classroom...)
<b>Classroom Learning Environment and Students Activities</b>
Collaboration, Team teaching, Co-Teaching, Discrimination, Gender-sensitive, Student engagement
Democratic learning environment
Attendance
Participant in extracurricular activities and mathematical activities
Exchange their intuition with respect diversities
Curious to learn and communication to each other