

Chapter I

INTRODUCTION

Background of the Study

Appreciative Inquiry is an organizational tool to facilitate positive change by focusing on what works rather than trying to fix what does not work. Appreciative Inquiry is the ideology that there is beauty or good to be found in every living creature, and like a living creature, every organization. Walker and Carr-Stewart (2004) describe appreciation as “affirming strengths, potentials and possibilities;” (p.72) as well as adding value to all circumstances and appreciating the best in people. Inquiry is a strategy of using personal reflection and discovery to create learning that each member of the program can bring a sense of openness and belonging to the group environment (Walker & Carr-Stewart, 2004).

Appreciative inquiry is a generative process that works in many contexts and is especially effective for improving productivity in the workplace. The appreciative inquiry approach uncovers what is working well in a system and creates more of the same. By crafting positive questions and revealing best practices, appreciative inquiry builds on the strengths of the system, unleashes innovation and imagination and begins an energizing cycle of discovery, dreams, and design. Appreciative inquiry builds on positive experiences to spark positive change.

Mathematics is related to daily livelihood; it is generally not considered so. I have come to realize this through my experiences as a general person, a mathematics student from primary to university level. My involvement on several activities made me feel mathematics, sometime it is very difficult and sometime it is very easy. These perceptions about mathematics, made by me, many times resemble with the views of different people; some of them define mathematics as the most complex subject

whereas some others compare it with other very general subjects. The traditional pedagogical approaches followed generally disempowering students from performing better in almost all the subjects, even more in mathematics. That beside the nature of mathematics, the way we acquire mathematics knowledge and perceive mathematics and the uses of mathematics we make, are also the major issues affecting mathematics learning. But many times the nature of mathematics that a teacher has and the pedagogy followed by him/her are interrelated and they affect each other.

In the context of Nepal; as majority of the mathematics practitioner are guided by the transfer of mathematics knowledge, their classroom practices do not seem much focused upon innovative creations of mathematics. Also the scope of learning mathematics is narrower and focused upon provide knowledge. Students hardly see any career in mathematics beyond teaching. Most of the classroom and pedagogy are guided by traditional format. Mathematics is treated as the collection of meaningless symbols and the teaching of the same as the reproduction of theorems (Luitel, 2009).

My experiences on mathematics learning

My education in primary level was way of learning conventional teacher-centered method. The teachers used to enforce the students for practicing the problems of mathematics several times targeting the examinations. When I read in this level, I was an average student in mathematics. I attain medium marks in mathematics. I always feel mathematics is not enjoyable, also the same for my classmate. I was not highlighted student among forty other students in the classroom for my teachers eyes. The teachers only used to focus upon the sharp students, with which we average and moderate used to consider ourselves as second-class student. Such practices disempowered us on mathematics learning.

I want to present a moment when I was in class six. Math can seem like a scary subject at first. When math teacher teach us through quizzes and other mathematical games, we aim to make fact and figures cooler than cool! We have lots of fun quizzes, which follow the common core standards, to help us study and learn mathematics effectively. Our lovely math teacher has supplied a helpful comment after each questions to help us understand how to work out the correct answer. Whenever I present solution of such type of problem effectively in the whole class, teacher praised me a lot and said that I had got good mathematical mind. It was another surprise for me to know that the student, who had not been able to perform better in mathematics examinations, had good mathematical mind. His all appraisals empowered me and made me value myself. From that moment onwards, I got excited to perform better in mathematics.

When I was in class nine, mathematics teacher teach us how the mathematical logics and patterns are originated and came to these forms and use them to solve any kind of related unseen problems. He teach us psychologically using different strategies based on constructivism (e. g. cooperative learning) by linking cultural mathematics to academic mathematics in the form of project work. He encourage us to collect purchasing and selling bills to give the concept of profit and loss. And then mathematics teachers frequently motivated us and empowered mathematical learning through several helps and inspirations, appreciating each of our successes and pointing out our potentials and others. Likewise the appraisals and the expectations from my friends motivated me more in my mathematics learning. Such appraisals even helped to establish good relationship among me, my friends and my teachers.

Remembering the same, these days I feel that students' motivation to learn can be enhanced by the teachers by pointing out their potentials. The appreciating words

and the successes I got in the field of mathematics made me confident and motivated me to excel in the field of mathematics. With these all, I had been able to prepare myself to learn mathematics at the higher level. I still think that, if I had not acquired success in several mathematical activities; if my teachers, friends and others had not motivated me; I might not have been able to make myself confident in mathematics.

Appreciative pedagogy may be regarded as an alternative pedagogy for the existing methodology of teaching and learning. In the Nepalese context teacher enters in a classroom and starts teaching the lesson right away in classroom settings more often. Whether the students understand and write their reflection is nobody's concern. If the teacher is kind enough, s/he gives answers or notes to the respective questions, and the students copy the same in the final exams. Some students may be very good in mugging up so they fare well, whereas the majority would suffer. However, even those who get excellent marks in exam often fail in the life to struggle because they lack both – creativity and confidence.

I realized and concluded that Nepalese education is mainly guided by chalk and talk methodology of teaching and the aim of education is basically based upon the transfer of knowledge. Mathematical facts are considered to be ultimate and no value is given to the students, their feeling and ideas they generate and also the knowledge they possess. Being more concentrated upon the mathematics classes, the above mentioned conditions become more complex. The aims of mathematics curriculum are strictly focused upon the transfer of pre-established facts and knowledge and repetition of earlier established algorithms and sometimes their articulations as well. Not giving much importance to the basic livelihood, mathematical contents just focus on remembering algorithms and repeating the formulae and applying them to the

mentioned mathematical problems. Students hardly get chance or are motivated to use what they learned and what values they acquired in their daily life.

Statement of the Problem

Especially mathematics classes are much affected by the nature of mathematics that teachers believe in and pedagogical approaches are almost the same; traditional, transformative and autocratic in rules and regulations. In classes, the teachers as an active player and students are as a passive receivers. In this research, I take the low achievement of secondary level mathematics students as the major researchable issue. Behind so many factors affecting that, I found the lack of positive reinforcement and motivation based teaching learning activities as one of the major ones. As Baskota (2011) said, “interest in a problem depends upon the researcher’s educational background, experience, outlook and sensitivity”

Students are scolded/negatively reinforced or punished on their failures in classroom activities and examinations. Sometimes such failing students are even assigned with the burden of extra classes and also tuitions and coaching are imposed. At extreme cases, the change of the subject teacher or the textbook is made. Many institutional schools seem to blame the teachers for students’ low achievement. This generally conceals the other curricular, pedagogical and students related drawbacks ultimately affecting the mathematics learning and achievement. In this regard mathematical problems are considered to be extreme and beyond the general people’s access.

Mathematics evaluations and other examinations are designed so that the examiners tend to find out what the students don’t know. These types of examination systems greatly disempowered students in learning. Students get dissatisfied with their mathematics learning and it gradually leads them away from their mathematics

learning. Similarly as mathematics learning is not linked to the local cultural practices and basic livelihood students gradually lose their ownership upon mathematics learning and regard it as just a burden for them, which is mostly prevailing in most of Nepalese mathematics classroom.

Purpose of the Study

The purposes of the study are as follows:

-) To explore the perception and practices of mathematics teachers about appreciative pedagogy in mathematics classroom.
-) To explore the opportunities and challenges of appreciative pedagogy in mathematics classroom.

Research Questions

This study has focused upon the pedagogical approaches and implementation of appreciative Inquiry, to complete the purpose of the study; I address the following research questions:

-) How do teachers perceive appreciative Pedagogy in mathematics education?
-) How do the teachers appreciate students in mathematics learning?
-) What are the key challenges and opportunities for implementing appreciative pedagogy in mathematics teaching?

Significance of the Study

Appreciative inquiry is a positive strength based inquiry. "Appreciative inquiry is for those persons involved in student affairs who want to explore and discern the best possible outcomes for their organization and thus for their students" (Elleven, 2007). Hence, this research was being significant for all those who are involved in mathematics teaching and learning so as to reconsider the appreciative pedagogy for mathematical practices, mathematics teaching and learning. It may even

be considered to be significant for students on their various social practices, and collaborative performances, managerial functions and mathematics learning. Likewise the research can be significant for the administrators and the educational managers to implement appreciative pedagogy for their activities. It may also be useful for the curriculum designers and different social activists as well.

Delimitation of the Study

The focus of the research is upon pedagogical aspect only. Likewise, the research was focused upon the use of Appreciative Pedagogy in secondary level mathematics classrooms. Even more the research study focused on the practices of compulsory mathematics only and more concentrate over existing practices and possible usage of appreciative pedagogy in mathematics teaching and learning.

Definition of the Terms

Appreciative Inquiry

Appreciative Inquiry is an organizational tool to facilitate positive change by focusing on what works rather than trying to fix what does not work.

Focus Group Discussion

Focus group discussion is a good way to gather together people from similar backgrounds or experiences to discuss a specific topic of interest.

Participation Interview

Interview with stakeholders are one-to-one conversations about a specific topic or issue. I interviewed 20 students and 5 mathematics teachers in my research study from five different schools in Bhaktapur district.

Classroom observation

Classroom observation is a formal or informal observation of teaching while it is taking place in a classroom or other learning environment. The researcher had used

the data collection form for classroom observation and school record were analyzed by grouping the similar information in descriptive method.

Perception

Perception is the process of attaining awareness or understanding of sensory information. It is cognitive processes involved in obtaining and storing knowledge.

Discovery

The process of finding information, a place, or an object, especially for the first time, or the things that is found. It is the act of detecting something new, or something old that had been unknown.

Design

Design is the creation of a plan or convention for the construction of an object, system of measurable human interaction. It is a roadmap or strategic approach for someone to achieve a unique expectation.

Dreams

Dreams are successions of images, ideas, emotions and sensations that occur usually involuntarily in the mind during certain stages of sleep.

Chapter II

REVIEW OF RELATED LITERATURE

“A literature review is a classification and evaluation of what accredited scholars and researches have written on a topic.” Hence a literature not only arranges the literatures together, but also classifies and organizes them into subtopics. Nicholas Walliman (2006) in Pant (2005) stated, “A literature review (or overview) is a summary and analysis of current knowledge about a particular topic or area of enquiry.” So besides locating, organizing and classifying the literatures, it is also the summary making and analysis of the contemporary knowledge on the same research issue.

Theoretical Review

Researches and theories are interrelated and inseparable. “A theory provides a conceptual framework for research. Research, in turn, contributes to the development of theory” (Pant, 2012). A theory plans and directs the research studies. Philosophies must be supported by any theory for its pedagogical implementation. Likewise the appreciative pedagogy is supported by many of the learning and social theories. “Appreciative Inquiry is a constructive , generative and thought provoking , postmodern philosophy that contributes to human being to find new and progressive path for personal and global good” (Chapagain, 2012). Postmodernist approach backs up the appreciative inquiry with the idea that knowledge and reality are socially constructed and meanings are not absolute, but relevant to practitioners. Also positivity from the postmodernist approach is the primary basis for e appreciative inquiry.

As the appreciative inquiry involves at least two persons, I consider it to be related to the social constructionism. Also as it values and honors the learners;

knowing, experiences and successes, it is related to the progressivist theory of knowledge. Likewise it can also be related to the emancipatory interest by Habermas. I also believe that appreciative pedagogy is closely related to collaborative approach of learning. As it focuses on students' positivity, experiences and interests, MI theory of learning by Howard Gardener also support appreciative pedagogy. The themes are Appreciative Inquiry, principles of Appreciative Inquiry, Four-D model of Appreciative Inquiry. I have discussed the themes below.

Appreciative Inquiry

Appreciate means valuing; the act of recognizing the best in people or the world around us and inquiry means the act of exploration and discovery (Eow et. al, 2010). Hence appreciative inquiry can be referred as the search of positivity inside the individuals. It searches the positivity, recognizes and values that. It is the way of finding out the best in people and the past best experiences so as to design and mould the future possibilities. "Appreciative inquiry is a macro-organizational approach to organizational development developed by David Cooperrider and Suresh Srivastva" (Hammond, 1998, p.6-7). It assumes every living system to have remarkable positively enriching potentials. AI is both the cooperative and collaborative search for the best in people, their organizations, and the world around them. The assumed changes in people are expected on the basis of such existing positive potentials. AI is even regarded as the process of catalyzing the positive changes.

Grant and Humphries (2006) stated it as, "a research method with a focus on positive organizational attributes that may fuel change" (p. 402). Such search of positivity helps to reveal organizational strengths and individual potentials, which later on can be used to meet and achieve the organizational goals. Onyett (2009) mentioned the core concept of Appreciative Inquiry as, "the central idea is that

meaningful and fundamental change occurs through discovering, valuing and building on the strengths, assets, visions, and ideals of individuals in a organization”.

Ashford and Patkar (2001) defined, “appreciative inquiry is a strategy for purposeful change that identifies the best of ‘what’ is to pursue dreams and possibilities of ‘what could be’. It is a cooperative search for the strengths, passions and life giving forces that are found within every system- those factors that hold the potential for inspired positive change” (p. 5). This way appreciative inquiry is a collaborative approach. For this people are interdependent upon one-another. All the individuals in collaboration intend to recognize the self and others’ positive strengths and later build them together so as to meet the successes.

Onyett (2009) mentioned, “AI is seen as a means to working smarter rather than harder, acting more interdependently than independently, and creating the environment that supports learning and improving clinical outcomes rather than assessing and allocating blame.” In this regard, Appreciative Inquiry can be regarded as collaborative effort of individuals working together to find the mutual positives and enhance that to achieve future possibilities. It involves systematic discovery of what gives a systematic life when it is most effective and capable in economic, ecological, and human terms (Hammond, Sue, 1998, p.6-7).

AI is both a theory and a practice for approaching changes from a holistic perspective. As theory, it recognizes the best in people and their capacities and motivates towards the future possibilities. It even recognizes the best strength and knowledge with which the future possibilities can be identified, built or discovered. As practice, AI merges the past and the present experiences and successes into possible futures. The past experiences and present activities are integrated and aim to define and achieve the future possibilities. As heliotropic effect, such integration

motivates and empowers the practitioners towards positive direction. Though other problem solving methods start from the desired objectives and goals to be achieved; Appreciative Inquiry focuses on positive aspects and strength, past and present activities and experiences of our lives and leverages them to correct the negatives, if any.

Chapagain (2012) stated that, “if we look for problems, we will find and create more problems. If we look for success, we will find and create more successes’ (p. 12). Hence AI focuses on finding the positive aspects and it can be regarded as a positive approach. It is the opposite of problem-solving approach (Hammond, Sue, 1998, p.6-7).

AI focuses on what we want more (Kelm, 2005, p.1). Not only the past experiences and achievements, it also affirms the students’ interest and correlates it to the future images. It is positive, strength-based approach to change. AI believes the powerful images of oneself and the world around help the person to inspire action and innovation. AI involves, in central way, the art and practice of asking questions that strengthen a systematic capacity to apprehend, anticipate, and heighten positive potential (Hammond, Sue, 1998, p.6-7).

It is a form of action research which helps to find solutions for the problems encountered during change processes. AI eventually leads into collaborative process of envisioning the best we can be and we can bring. “After the discovery and valuing of the best here and now, the process moves towards the search of new processes” (Yballe & O’Connor, 2000, p.2). In this regard, AI is a continuous process of searching and finding new changes. Conversations help to facilitate the appreciation and creation of a common image, a common vision of the ideal institution

(organization or classroom). Discussions together make individual appreciation the collective appreciation, and individual will can become collective will.

AI can also be regarded as humanitarian approach for bringing out the positive changes. It assumes the human beings to have numbers of positive and negative potentials. Individuals seem to develop their identity with the help of the potentials they possess. The search and valuing of the positive potentials is expected to create positive reinforcement of human beings. Whitney & Trosten as cited in Chapagain (2012) said, “Appreciative inquiry treats people like people, and not like machines. As humans we are social. We create our identities and our knowledge in relation to one another. We are curious. We like to tell stories and listen to stories. We like to learn and use what we learn to achieve our best.”

The Principles of AI:

There are eight principles of appreciative inquiry. Among the eight principles, David Cooperrider in the early 1990s created the first five original principles, which describe the basic tenants of the underlying philosophy. In 2003 Diana Whitney and Amanda Trosten-Bloom proposed three additional principles in their book *The Power of Appreciative Inquiry* (Kelm, 2006, p.3).

The constructionist Principle

This principle of AI believes that organizational destiny and human knowledge are interwoven (Cooperrider and Whitney, 2001, p.14). Students should not be treated as having brains like blank papers to be filled. This believes that the students are not empty minded and their prior experiences and successes help them to construct knowledge and achieve successes. Teachers are suggested to provide more opportunities for the construction of knowledge, skills, experience, and potentials in order for students to construct tomorrow’s possibilities

The simultaneity Principle

It recognizes the discovery or inquiry of positive images and change to go simultaneously. They are not truly separate moments. “Inquiry is intervention” (Cooperider & Whitney, 2001, p.15). Students reflect and reconstruct their future based on what they found, whenever they are exposed to numbers of alternatives.

The poetic Principle

Past, present and future are regarded as endless sources of learning and inspiration or interpretation. The important implication is that we can study virtually any topic related to human experience in any human system or organization (Cooperider & Whitney, 2001, p.16).

The anticipatory Principle

Appreciative inquiry anticipates the future possibilities with the help of past and present positive images. “The infinite human resource we have for generating constructive organizational change is our collective imagination and discourse about the future. Learning by doing is considered the most effective way; as visions are transformed into actions and it is necessary to provide students with opportunities for actions, decisions and perceptions. It believes what we anticipate is based upon what we enact. This even helps individual to create vision before decisions what we believe, we conceive.

The positive Principle

Appreciative inquiry is based upon the positivity of individuals and focused on bringing out the positive changes. AI focuses on what should be rather than what is wrong (Kerka, 2003). The theoretical and practical approach of AI provides teachers with a guide in cultivating life-long learning among students. The positive core expands as it is affirmed and appreciated.

The wholeness Principle

“Wholeness means involving the entire subjects in a large group to stimulate collective capacity. Wholeness is expected to bring out the best in people” (Eow et al., 2010). Not only the involvement of entire subject, but it also expected to bring the completeness in outcomes. Appreciative inquiry is a group-based approach.

The enactment Principle

This principle of AI emphasizes on making a change that one really wants. Positive change occurs after a model of ideal future and living examples of future. Teachers need to create platforms and pedagogical options for students so that they feel they are in control of their own learning (Eow et al., 2010) for students. Making just the visions is not proper; one must also try for that.

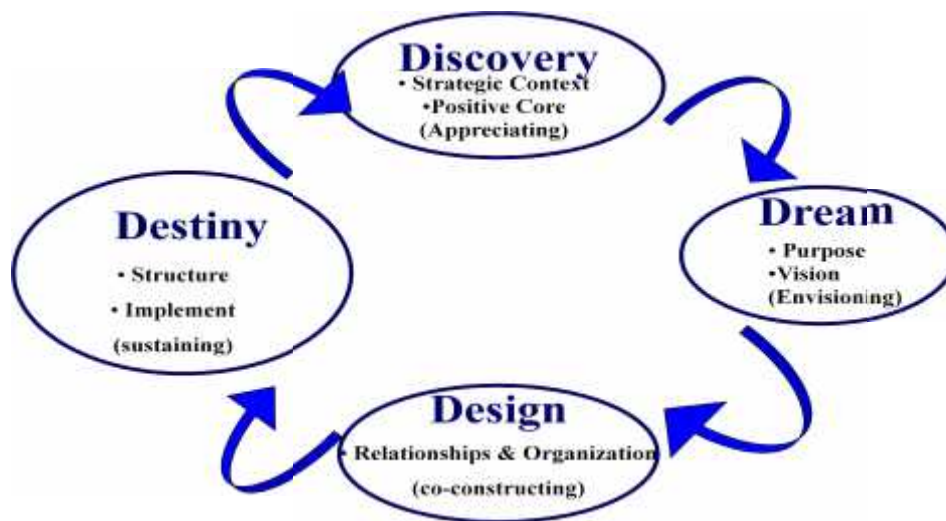
The Free Choice Principle

A freely made choice helps an individual to perform better and to be more committed. “Free choice stimulates creativity and positive change” (Eow et al., 2010). This principles of AI promote democracy for students to chose from several alternatives and envision own future possibilities.

The 4 D’s Model of AI

The 4D model consists of discovery, dream, design and destiny stages. Discovery stage is the search of positivity that gives strength and energy to an individual, through dialogue and conversation and peaking experiences, appreciating and valuing the best of what is? Information and stories are gathered about what is working well. Before discovering, the students must be exposed to the number of alternatives. After this, The intent of the dream phase is to identify and spread generative, hopeful images of the future. the students are lead to envision and imagine the possibilities. Dream stage connects a person to images of all possibilities, in

relation to the earlier discovered potentials the construction of articulation of dreams occurs in the next Design stage. In design phase, determining what should be? How can we move from where we are now to this vision of the future that we have created? How can we put the ideas into practice? Who will be involved. Destiny phase initiates a series of inspired actions that supports ongoing learning and innovation or "what will be?"



Source: Cooperider, Whitney and Stavros (2003)

Appreciative inquiry is not only important for classroom teaching; it is even fruitful for educational improvement and empowerment activities. It helps the individuals for designing and implementing the activities where the participating individuals, both the teachers and the students, get chances for self- evaluation and self-judgment. As discussed earlier, appreciative inquiry is collaborative in nature, in the same way Appreciative Pedagogy believes the face-to-face interactions as the best way to share the mutual experiences and learn together.

Taba Model of Curriculum Development

Focusing on teachers' role on curriculum development, Hilda Taba proposed this model of curriculum in 1962. She argued that the teachers who teach curriculum must participate in developing it. Taba model of curriculum development consists of the steps, like diagnosis of the need, formulation of the objectives, selection of content, organization of the content, selection of learning activities and evaluation; and means of evaluation (Taba, 1967).

As teachers are directly related to the students' learning, diagnosis of the needs may be referred as the explorations for positivity and identification of the best positivity of the students, which is similar to the discovery phase of 4 D' model of Appreciative Inquiry.

Empirical Review

Appreciative inquiry as the appreciative pedagogy has been extensively used in classroom activities. There have been so many researches, case studies and action researches about the classroom practices of appreciative inquiry and efficiency in learning. Here I am going to discuss some of them.

Harkess (2004) had done a management project titled, "Appreciative Inquiry-a reflection process for one year pre-service teachers during professional practice." Through the study, he investigated the effectiveness of appreciative inquiry as a reflection model for one year pre-service teachers during their first professional practicum. For this qualitative research methodology was used and within that observation technique was followed. Altogether twelve teachers were chosen. The classes of pre-service teachers were observed by the researcher as the visiting lecturer for each subject and the data from the observations were recorded. Through his research he concluded that Appreciative Inquiry supports first year pre-service

teachers to reflect effectively on their teaching experiences. He also concluded that appreciative inquiry provides a rich language base from which pre-service teachers can envision future possibilities and sustain their passion for learning and teaching during their daily practice.

Willoughby and Dr. Tosey (2007) had published a research article titled, “Imagine ‘Mead field’: appreciative inquiry as a process for leading school improvement. The article was based on research for doctoral program of Dr. Willoughby, supervised by Dr. Tosey, aimed to evaluate AI as a school improvement process. The article examined the application of appreciative inquiry as a contemporary approach to organizational change in the business world, as a participative means of school improvement. In the paper appreciative inquiry has been regarded as a contemporary theme in literature on school improvement such as self-evaluation, capacity building and distributed forms of leadership.

In the paper, appreciative inquiry was introduced and reviewed with reference to its increasing scope in business and American schools. He had studied with qualitative methodology, action-orientated, bounded case study to evaluate a real AI project titled ‘Imagine Mead field’ in the school where Dr. Glyn was the head teacher. They seem to conclude that the evidence of Imagine Mead field suggests that appreciative inquiry can involve members of the school community in decision-making, which may assist in the creation of a positive and democratic ethos. They also concluded that appreciative inquiry can limit as well as create opportunity for student voices to be heard and AI is necessarily political and that it has apparently benign, rational motives to encourage motivation and to distribute leadership. Even the authors seem to conclude that AI can involve an entire school community in a process of collaborative school review, and can engage with school ethos and culture.

Grant and Humphries (2006) published a paper titled, “Critical Evaluation of Appreciative Inquiry: Bridging an Apparent Paradox”, through SAGE publication. They proposed to see if critical theory provides one of the useful lenses through which to develop an appreciative evaluation of the process. They even discussed how critical theory can be applied to evaluate appreciative inquiry so as to bridge the negatively oriented past affairs and the positive focuses after the implication of appreciative inquiry. The authors used the action research methodology for their research study and concluded that the combination of appreciative inquiry and the critical theory approaches a new, the critical appreciative processes (CAP), which focus researchers and participants in emancipator ideals which provide a fruitful contribution to action research processes intending to enhance human flourishing.

Research Gap

Appreciative inquiry in the classroom is an emerging issue in the academic contexts, all over the world. Several researches made upon the implementation of appreciative inquiry in pedagogical activities concluded that appreciative Inquiry helps to make the classrooms more democratic and inclusive. But most of such researches are found to focus upon the management aspects like, school management, classroom management, and teacher development. In Nepalese context, the concept of classroom activities based upon the appreciative pedagogy is almost new. Likewise, I could hardly find any formal pedagogical practices based upon Appreciative pedagogy, in Bhaktapur. Hence this research aims to fulfill, in certain way, the need of research studies based upon the appreciative pedagogy in mathematics teaching and learning in Bhaktapur. My research study was focused upon the appreciative practices in usual mathematics classroom and the possible use of appreciative pedagogy in the mathematics classroom in the days to come.

Chapter III

METHODS AND PROCEDURES

In this chapter, I introduce the methodology that has been used in the study to collect data, analyze and draw conclusions from them. Also the research design, research method, participants and their selection procedures were also addressed in this chapter. I was also included and discuss the instruments for data collection and quality standards .

Design of the Study

This study was based on narrative research designing in qualitative approach. Qualitative research methodology deals with the collection of information formally and informally and using themes to draw conclusion about the views and attributes of people. This approach to research involves the exploration and interpretation of the perceptions, opinions, aspirations, behaviors, concerns, motivation, culture, or lifestyles of small samples of individuals (Pant, 2012). Hence qualitative research analysis explores the issues from the existing environment, understands and interprets the ongoing phenomenon and answers the aroused questions.

Through my research agenda, I explored Appreciative Pedagogy, teachers' beliefs about it and its practices in secondary level mathematic teaching. The data for my research were in descriptive form rather than numerical or inferential. Teachers' views and attributes towards appreciative pedagogy and their practices of appreciative pedagogy for empowering mathematics teaching and learning were the prime data for my research. I tried to find subjective meanings of appreciative pedagogy, its practices and possible implementations in mathematics teaching and learning. In this research, I have selected appreciative pedagogy as the issue; I have studied the

different aspects and processes related to that and the status of the same in Nepalese curriculum and mathematics teaching and learning activities.

Narrative Research Design

In my research participants' interviewed focused upon perception and practices of Appreciative Pedagogy through their stories, individual experiences, beliefs and practices observed during field work. During data collection, I motivated the participants to share their experiences. I even organized the experiences in chronological order. I always motivated the participants to share their own stories and experiences and narrated them to further explore their beliefs, practices and attributes about Appreciative Inquiry/Pedagogy in mathematics teaching. I have even restored the stories told by the participants so as to code themes.

Research Site and Sample of the Study

As the major tools for collecting data in narrative research design are interviews and field observation. My research site is Bhaktapur as a student researcher, for easy availability and accessibility and also for riches in information; I had purposively select and interview five mathematics teachers from different schools of Bhaktapur with males and female mathematics teacher. I had even interviewed some students also. Though the selection of schools is purposive, a consideration was including both private and public schools. Among select three were public and two were private schools.

Data Collection Tools and Procedure

Focus group discussion, Participants' interview and class observation was the major tools for data collection. They are as follows:

Focus Group Discussion

Focus group discussion is a good way to gather people together from similar backgrounds or experiences to discuss a specific topic of interest. For the purpose of to explore the perception and practices of mathematics teacher about appreciative pedagogy as well as what are the main challenges of appreciative pedagogy in mathematics classroom, I had prepared clear and specific guideline then conducted one focus group discussion involving lower/secondary level mathematics teachers of Bhaktapur. Altogether there were 5 participants. The focus group discussion was conducted in A-One cafe suryabinayak for the convenience of participation group.

Before starting the focus group discussion the participants were clearly explained about the objective of the research then started the programme with sharing introduction to each other. I started discussion through open and semi-structured question. Also, to make discussion easy and purpose oriented I had given the chance to interaction between each participant. Even they were assured for confidential issues and also actual representation of the shared views. During the focus group discussion, I had just played the role of facilitator and participated in discussion only for facilitating the participants to share their experiences and ideas and beliefs; so as to explore more about Appreciative Inquiry in mathematics practices. The data had collected in the form of field notes and audio recording. For complete the programme I had one volunteer facilitator who is knowledgeable about my project.

Interview Schedule

Discussion of qualitative research interviews have centered on promoting an ideal interactional style and articulating the researcher behavior by which this might be realized. Interview with stakeholders are one-to-one conversations about a specific topic or issue. The main aim of this interview is to explore the perception and practice

of appreciative Pedagogy in mathematics classroom as well as to find out the possible opportunities and challenges of the same. In my research, before the interview open-ended and semi-structured question sets are prepared. The interviews of teachers and students participants are one-one in-depth and conducted at multiple levels until the data are saturated.

I interviewed twenty students and five mathematics teachers from five different schools in Bhaktapur. The interviewed teachers had also participated in focus group discussion. Through interviews I tried even the student participants and the data from the field observations justified that they used such practices and activities.

Classroom Observation Note

During the classroom observations, the considerations were made not to disturb the natural setting inside the classroom. The main purpose of the classroom observation was to find out the practices of appreciative inquiry in the context of mathematics teaching. I requested to teacher for observe their class but I didn't clarify about my research purpose to ensure the trustworthiness of my study. In classroom observation practices of Appreciative Pedagogy in mathematics teaching were collected in both textual form and audio recordings.

Nature and Sources of Data

This research is qualitative in nature. Qualitative data collection is done either through observation or interviewing people. The data for this research are the information provided by participants, field notes gathered through field observation and focus group discussion and the data from past researches and literatures. Participants' views, experiences and attributes about Appreciative Inquiry/Pedagogy

were collect either in verbal or written form. Besides these, the documents obtained through several authentic sources were also regarded as data.

Data Analysis Procedure

Data analysis is the method of interpretation of the raw information to transform them into meaningful understanding. This section presents the methods and process of analysis uncovering the critical and intellectual perceptions of individuals. This study is mainly focuses on to find out the perception and practices of teachers on appreciative inquiry as well as to explore the opportunities and challenges of appreciative pedagogy in mathematics classroom. As it is a qualitative research work, researcher used a qualitative method to analyzed and interpret the data. Researcher used description rather than the statistical analysis. Qualitative data analysis pays particular attention on the context and meaning. In this study data, text is the main source of the knowledge. The researcher reads all the data many time for making it deeply impress in the data. The researchers edited it and make a general sense about this study.

The researcher had used the data collection form for the observation and interview. An observation form and set of questionnaire for interview were made and data were collected for analysis with the guideline of research guide. The collected data were categorized according to the category of the respondents and their different code was given in the text of interviewed and observation notes. The data collected from interview, classroom observation and school record were analyzed by grouping the similar information in descriptive method. To maintain the validity and reliability of the result of the study triangulation was adopted. The data was analyzed and interpreted by using the frame work that the researcher had developed in literature review.

Quality Standards

It is necessary that the quality of data and then their analysis is to be maintained. The quality standards of the data for research signify the quality of findings thus obtained and the conclusion made through that. I considered that my research maintained quality standards in the following ways.

Trustworthiness

For trustworthiness of research, field notes and audio recordings of interviews, field observations and focus group discussion were made. To maintain trustworthiness, I listened to participants' voices and I deeply immersed myself in the research process. I tried to find out actual data by conducting a series of interviews. To maintain trustworthiness in my research, the following concerns were used.

Credibility

Credibility is the criteria which talks about the idea of isomorphism between constructed realities of participants and those realities as represented by the researcher. For maintaining the credibility of research, I made sequence of in-depth interviews of the participant's, had prolonged engagements in the field and made an in-depth analysis of the obtained data. My engagements continued till the real data were obtained.

Dependability

For maintaining dependability in my research, I did not participate in interviews and observations with any pre-assumptions and beliefs. The questions were open-ended and semi-structured .I focused upon exploring their real views and actual data. Likewise even while coding, theme generating and analyzing, serious considerations were made so that my personal beliefs and attributes would not affect

meaning making and conclusion deriving process. I deeply immersed into the research process.

Transferability

To establish the transferability in my research, I made maximum description of what participants said during the interviews and what I found during the class observations. This way the participants' experiences and views are more important to construct the transferability in this research study.

Chapter IV

DATA ANALYSIS AND INTERPRETATION

The purpose of this study was to help student identify their unique strengths through an appreciative inquiry process, and to see if emphasizing their strengths would increase student success and motivation. The following sections will outline perceptions and practices of mathematics teachers, challenges and opportunities of appreciative pedagogy

Perceptions and Practices of Mathematics Teachers

Perception is the organization, identification, and interpretation of sensory information in order to represent and understand the environment and practice mean something that is usually or regularly done, often as a habit, tradition, or custom. Now in this chapter, I have tried to explore the perceptions and practices of participant teachers in mathematics teaching. To explore the perceptions of teachers, I interviewed five participant teachers and to explore their practices and observed their classes frequently. Also I interviewed 20 of their students so as to explore further about teachers practices. Through the analysis of obtained data, I have tried to find out what do mathematics teachers in Bhaktapur perceive about appreciating the students and using that in their teaching. Also I have tried to find out different activities that the mathematics teachers are using for appreciating their students.

How do Teachers Perceive Appreciative Pedagogy in Mathematics Teaching?

Teacher is integral part of the teaching learning activities, which facilitate students to achieve their desired destination and also designs the classroom activities, implements that among the students and intends to achieve the learning objectives. Because of this reason the perception of teachers related to mathematics, nature of mathematics, mathematics learning, knowledge construction and meaning making and

others directly and indirectly affect mathematics learning. Hence, before finding out different appreciative practices used by mathematics teachers in Bhaktapur, I tried to know how they perceive appreciative pedagogy in mathematics teaching.

The teacher's perceptions about appreciative pedagogy have been analyzed through their view about the nature of mathematics and mathematics learning, teaching methodologies they use mathematics achievement they consider and various others. Some data related to the perceptions have been extracted from different activities they perform inside the classroom as well. Also their behaviors with their students inside and outside the classroom were the matter of consideration. While interviewing participants, teachers were not directly asked about Appreciative Pedagogy.

For analyzing the perceptions of mathematics teachers, the focus is made upon their view about nature of mathematics, scope of mathematics, forms and formations of mathematics, mathematics teaching and learning, related pedagogy and different practices of mathematics teaching. Another section has focused on different appreciative practices that the mathematics teachers are using for mathematics teaching. May it be harder to find actual appreciative practices and 4D's model of Appreciative Inquiry? Hence data analysis focused upon different practices that are somehow related to appreciative inquiry. During this, I had analyzed the activities of the teachers and the strategies they use to explore the different capacities and successes of students, and the way they value students and the way they design and implement treatment based activities for the students.

Perception of teacher

For this research, I had selected five lower/secondary level mathematics teachers of Bhaktapur is purposively. Three of them represent public schools and two represent private schools.

Teacher Sigdel has been teaching compulsory mathematics teacher in a reputed private boarding school in Bhaktapur since five years. Initially he was lower secondary level teacher and it is almost three years that he has been teaching for secondary level students as well. At first, he teaches by rote learning method, and also he did not focus the student in a classroom. By using this type of teaching students feel boring in his class. After that he improves slightly his teaching method and teach student centered method. By applying learning by doing method, he uses the word such as:

From	To
What is wrong with this answer?	What is right with this answer?
What is the problem here?	What is the solution here?
You shouldn't.	Have you tried...?
You made mistake here.	What can you learn from this incorrect answer?

When he apply these types of encouraging words, then students are taken mathematics is not hard rather than they do. Students are ready to solve the mathematical problem whether they find or cannot find the correct answer. Teacher feels that learning improves when learners have a sense of what they are setting out to learn, and explicit statement of standards they have met the learning outcomes.

Teacher Keshav is a secondary level mathematics teacher in a public school. He has been teaching in the same school since half a decade including initial two

years in lower secondary level. Now he is also a part-time teacher in a nearby private school. He recalls that his performance in mathematics, when he was in secondary level, was not good enough. He had appeared SLC examination in the same course that he is teaching now. As a mathematics teacher, these days, he considers mathematics as an easier subject and regards it no more difficult than any other language subject. He believes mathematics knowledge to be constructed inside the classroom.

Teacher Kopila is a female lower secondary level mathematics teacher in a public school. She has been teaching in the same school for more than ten years. Before she used to teach mathematics up to class nine, but now she teaches up to lower secondary level. The school where she teaches was initially a girls' school and now it is co-ed since four years ago. She shared her experiences,

"I found myself easier in co-education classroom. As boys are comparatively active and better in mathematics, girls seem to imitate them and there seem to be better competition inside the classroom. There cannot be better environment for competition in unisexual classroom. When there were only girls inside the classroom, favorable conditions of competition were rarely found."

Teacher R.L Sah is a secondary level mathematics teacher in a private boarding school. He said *"About teaching after nine years experience; Traditional teaching methodology is very dictatorial, the teacher is in the center and students are not allowed to give their opinions. Students are those who are always afraid of teacher, as he is the one who asks for discipline and order. I think that teaching methodology has an important role on student's motivation for school. Traditional teaching methodology is less motivated for children, is boring for both teacher and student, is more or less a routine; there are no attractive activities for students that a*

teacher can apply. Modern teaching methodology is just perfect for both students and teachers. It helps students to be more involved and independent, but above all, it is important that this methodology has changed my approach to students, especially in terms of cooperation. In terms of teacher's perceptions toward teaching as a profession, there were no clear differentials, and in general all teachers presented with high positive perceptions toward teaching as a profession."

Teacher Kafle is a lower secondary level mathematics teacher of private boarding school. He said that, *"Mathematics is as general as other subjects but parents, students, teachers and other stakeholders related to mathematics have established it as very complex and challenging subject. The teachers regard it as harder to teach and others to learn and achieve. Otherwise it is as normal as other subjects. It is rather easier to implement directly in daily life"*. When he entered the teaching field, he was untrained and his teaching way is traditional. But when he attempt teacher training his method of teaching become modern, technological and he thought that teacher as a facilitator not a active player in teaching learning process.

How do Mathematics Teachers Practice Appreciative Pedagogy?

During the classroom observations, the considerations were made not to disturb the natural setting inside the classroom. During the focus group discussion, I had just played the role of facilitator. I participated in discussion only for facilitating the participants to share their experiences and ideas and beliefs; so as to explore more about Appreciative Inquiry/Pedagogy in mathematics practices. Some teachers are even found to believe classroom interaction as a part of their learning activities and some may not consider so. The teachers who believe that knowledge can be constructed and generated within the classroom and treat the students as if they are not empty minded, may regard Appreciative Pedagogy as a tool for empowering their

own professional career as well. The changing trends in teaching and learning lead them towards the gradual change in mathematics teaching and learning.

This section will be focusing on different appreciative practices that the mathematics teachers are using inside the classroom. As it was found that the interviewed teachers don't know about Appreciative Inquiry and Appreciative Pedagogy, it will be harder to find actual appreciative practices and 4D's model of Appreciative Inquiry in Nepalese context. Hence the analysis of data obtained from the interviews of teacher and student participants, mathematics personnel, field observations and focus group discussion was focused upon identifying different practices related to Appreciative Inquiry/Pedagogy. For this, the teachers use different activities to explore the different capacities and successes of students and to value students and the treatment based activities for mathematics teaching. Similarly the evaluation methodology and other curricular and extracurricular activities are even be considered.

Most of the teachers shared that though they want to address the current issues and students' interests inside the classroom and integrate them in mathematics teaching, the complexities in the nature of mathematics education and the complexities in the present mathematics education system make them harder and almost impossible. One of the teachers in informal discussion shared,

“The students are much more interested in technology and I know a little bit about integrating ICT in mathematics teaching. But school administration is not ready to manage the required resources inside the classroom and forces me to carry on my teaching in the usual manner. The administration sends me to several mathematics teachers' trainings but I don't get proper environment to implement my learning”

Different trainings organized for them usually seemed to focus mainly on the problem solving approaches. Though they are interested to run their classes in democratic manner and to address the newer issues in mathematics teaching, they are hardly trained accordingly. Similarly, the centrally designed and hall-paper based evaluation systems, the expectations from the guardians and the students and the administrative pressures, enforce the mathematics teachers to follow the problem solving skills. Likewise, the number based achievement evaluation even prohibits mathematics teachers to employ newer teaching methodologies. Related to this, Teacher R.L. said,

“I use different methodologies like constructivism, paper cutting and material development, using ICT and collaborative approaches. Different methods can be used for constructing knowledge inside the classroom and for making students conceptually clear. But I mostly use problem solving method. It is somewhat mandatory because of class time-length and guardians' and administrative pressure and other affecting factors.”

But by observing and interviewing students it was found that some aspects of 4D' model of Appreciative Inquiry seemed to be adopted inside the classroom. Teachers were mainly found to be focusing on identifying the weakness and strength of students so as to provide necessary remedial support. The teachers seemed to apply various methods and activities to support their students' mathematics learning. Many times teachers claimed to care and support students in their personal problems and some of the students even admitted that. The teachers practicing that seemed to have good relationship with the students. Students even accepted that these practices support their learning and foster their enthusiasm. Some teachers seemed to discover the portions or chapters in mathematics, where the students can perform better and

they can enable them to excel in the same. Students even seemed to appreciate teachers' teaching in such situations. Most of the appreciative practices followed by the mathematics teachers in Bhaktapur are as follows:

-) Individual Care and scaffolding
-) Peer Group Support
-) Mass Motivations and Appraisal
-) Other Appreciative Practices : such as project based activities, Quize etc;

Challenges and opportunities of appreciative pedagogy

Opportunities of Appreciative Inquiry

A fundamental principle of appreciative inquiry is that asking positive questions leads to constructive change. The momentum for such change comes about through communication that creates positive affect and social bonding. It helps to seek mathematics successes and strengths, mathematics cultural practices and techniques for employing mathematics knowledge. Besides helping for mathematics teaching and constructing mathematics ideas and knowledge inside the classroom, it even helps for the teachers and students to develop democratic practices inside the mathematics classroom. It is even helpful for the teachers to maintain justice inside the classroom and assures the valuing of students. Following are some of the opportunities of Appreciative Inquiry inside the mathematics classroom:

Motivated Students and Teachers

Motivation refers to the reasons for directing behavior towards a particular goal, engaging in a certain activity, or increasing energy and effort to achieve the goal. Appreciative Inquiry based classroom is by nature a learner-centered classroom. It regards students, their perceptions and values, strengths and potentials, as the center of classroom teaching and even outside that. For a mathematics teacher employing

Appreciative Pedagogy, every new class is an opportunity for new experiences.

Students' motivations and enthusiasm upon learning is one of the motivational factors for teachers. Also E-learning helps teacher and students to learn mathematics easily and effectively and it provides different mathematical emerging issues through networking technology which also appreciate teacher and students to seeks new ideas. In an appreciative based mathematics classroom, students are motivated and empowered for exhibiting their experiences and potentials and collaboratively discuss among the co-learners and the teachers to share their own ideas and mutually respect others.

“In student-focused learning environment, students are the producers of ideas as teachers actively and consciously encourage and facilitate students to engage in collaborative learning activities that requires multiple levels of thinking” (Singh, 2009). One of the magnificent features of the Appreciative Inquiry based classroom is motivated student. Students are motivated either by being valued or they find the environment suitable for their learning. In case of mathematics classroom, Appreciative Pedagogy motivates students by addressing their interests, valuing their strength and successes, employing themselves in mathematics teaching and learning, fostering their knowledge and practices and rewarding them. All these motivate them for mathematics learning, mathematics creativity and mathematics based practices. It has already been discussed above that, different practices of Appreciative Pedagogy even help to avoid the phobia of mathematics persisting in the students.

Appreciative Inquiry even helps for the shared values and shared practices inside the mathematics classroom. Each of the knowledge that students construct, each of the behavior that students exhibit, each of the practices that students follow and each of the activities that students perform are valued and considered to be

important. Students feel motivated with all these. Likewise, as appreciative inquiry based mathematics teaching is inclusive in nature, it inspires every student to raise their voices, exhibit their practices and equally participate in learning. Appreciative Inquiry even enables inquiry based mathematics teaching and learning by properly valuing the learners. Teacher Keshav said,

“Even single positive behaviors or a word to the students make them feel proud and motivated upon performing better.”

In an appreciative inquiry based mathematics classroom, students are encouraged to realize their own strength, make successes, and recall the successes and experiences so as to make further successes. Sullivan & Donough (2007) shared conclusion as, “One of the results of interest is the positive self ratings of the students’ confidence that they can learn mathematics”.

Teacher R.L Sah said, *“Though we do not have that much developed mechanism inside the classrooms for the students to reflect their past experiences and successes. But as I implemented same thing in several extended mathematics teacher trainings, the participating teachers were found motivated and encouraged. I consider these things useful in mathematics classrooms as well.”*

Through different appreciative practices, students interact with each other, tell and share each-other’s constructed knowledge and experiences. Many times students learn by reflecting their own experiences and past successes. “People are highly motivated by their own stories and images of success” (Carrstewart & Walker, 2003; as cited in Bentkowski & Yamaga).

Even the teachers themselves inside the Appreciative Inquiry based classroom are motivated in conducting classroom activities in a positives based approach, rather than through usual problem solving based methods . For a mathematics teacher

employing Appreciative Pedagogy, every new class is an opportunity for new experiences. Students' motivations and enthusiasm upon learning is one of the motivational factors for teachers. Likewise, positively based practices are often the factors for motivation. Also they are believed to accept that, "change is a fundamental feature of modern life and it is necessary to develop social systems that can learn and adapt" (Singh, 2009).

Inquiry and Interaction based Mathematics Classroom

Appreciative Inquiry is by nature an interaction based approach which enables the enhanced engagement of teacher and student together through which they collaboratively seek and find the positives that help for learning and building future. "Inquiry-based learning is rooted in constructivist theories that suggest that people learn best when they are actively engaged with subject matter" (Glasserfeld, 1991 as cited in Marin, 2014, p.22). Such interactions and inquiries are among the participant practitioners. Likewise effective mathematics learning itself needs interaction among individual/s. Even inquiries are needed in mathematics learning so as to carry out interactions for mathematics practices, findings and creativities. Teacher Ramkrishna said,

"According to Appreciative Pedagogy such as peer group discussion, individual caring, the things that can be immediately applied are positively reinforcing students and making focuses upon their successes and potentials."

So Appreciative Inquiry in mathematics teaching promotes interactions, among students themselves and between students and teacher. It also promotes and contributes for mathematical inquiry. Mathematical inquiry is an inquiry-based approach in mathematics education in which students learn by engaging in mathematical discussion; making, proving and disproving conjectures and arguments

and others. All four stages of Appreciative Inquiry; discovery, dream, design and destiny, require interactions for successful implementation inside the classroom. Teachers need to interact properly with students to discover their strengths, positive and past successes. The discovery phase requires proper classroom interactions so as to discover actual positives. The phase of dreaming is made by teachers and students together.

During the focus group discussion, I had just played the role of facilitator. I participated in discussion only for facilitating the participants to share their experiences and ideas and beliefs; to explore more about Appreciative Inquiry/Pedagogy in mathematics practices. Some teachers are even found to believe classroom interaction as a part of their learning activities and some may not consider so. The teachers who believe that knowledge can be constructed and generated within the classroom and treat the students as if they are not empty minded, may regard Appreciative Pedagogy as a tool for empowering their own professional career as well.

Contextualized mathematics and Ethno-mathematics approaches

Ethno-mathematics seeks idea about how to make mathematics understandable and easy related with students day-to-day activity, culture and society. It also helps to preserve students unique cultures values, activities, developed student's unique way of seeing the world and cultural transmitted from one generation to another. It also helps to respect on culture as well as others cultures. . Appreciating in mathematics classroom may be regarded as valuing students and their learning, the knowledge they construct and possess and teaching according to their needs. A teacher employing Appreciative Inquiry in mathematics teaching may be worried about different

techniques students use to construct knowledge and the methodologies the students feel easier to understand and learn mathematics.

The teachers may explore different locally available resources and practices which can be integrated inside the mathematics classroom. In-depth interaction with local practices may help for having discourses for contextualizing. Teachers may even design project works and employ students in those project works. Teacher Kopila, signifying project works as the appreciative approach, said,

“I motivate students to use easily available resources for their projects. Sometimes I bring different waste materials inside the classroom and use for mathematics teaching. They feel excited to use such materials in their learning and regard their classrooms as their own community.”

The resources and the materials thus obtained locally are viable from economic perspectives as well. Likewise using locally available materials as the resource for mathematics learning help the learners to link their mathematics learning in daily lives and later implement them in livelihood as well. The curriculum designers and the teacher trainers can play proficient roles on promoting teachers in mathematics contextualizing.

At the policy level, teaching in the local language and adapting the local context can be made. Similarly using ethno-mathematics approaches help the learners to see mathematics within their social and cultural practices. Are the different traditions and rituals based upon mathematical values and norms? Appreciating students inside the mathematics classroom motivates and helps the mathematics teachers to use such approaches to support students’ practices and activities. All these also help the learners to link mathematics practices from local to global perspectives and vice versa. Even identifying different usual practices as mathematics approaches

help the learners and the individuals involved to find ownership upon mathematics and mathematics learning.

Different ethnic groups in Nepal have their own ethnic practices in measurement, calendar, calculation and others. Linking these in mathematics learning helps in the contextualization of mathematics. Different household utensils bear geometric shapes. Bringing those inside the classroom or making examples help the learners to contextualize their learning.

Democracy in Mathematics Classroom

Appreciative inquiry based learning is itself democratic in nature. Search of positives in every minute component and inclusive nature is its democratic feature. It regards every minute form of positivity as the resource for learning. Beside these, appreciative practices also provide the opportunities for learners to explore and demonstrate their positives and discuss further. Teacher Sigdel said, *“Inside democratic environment in mathematics classroom, it enhances every mathematical practice, enables the practitioners to perform better on their identical practice, link their successes to achievements and their past failure to probable future successes”*.

Mathematics is basically a group activity. We find various collective approaches in mathematics practices. Mathematics education literature emphasizes on the importance of establishing mathematics discourse communities in mathematics classroom. Students generally share the ideas and practices mutually while working in group. Children actively construct their mathematical understandings as they participate in classroom social processes. For student to construct mathematics knowledge inside the classroom, proper communication is essential so that they can share their own ideas, listen others', think and rethink the shared ideas and make a

common meaning and construct knowledge. Also the practice of democracy learning support by providing students the opportunities to facilitate whole classroom also contribute to students' mathematics learning in various ways. When the students facilitate in the classroom, the teachers provide scaffolding and right amount of help at right time. Teacher Ramkrisna said,

“unless we are able to maintain the components like justice, inclusion, impartiality and others, we will just be empowering the observed learners and the actual teaching-learning objectives cannot be achieved.”

The collaborative practices in mathematics learning motivate the learners to listen to others' values and ideas and mutually respect and share them. In a student-centered democratic classroom, students and teachers collaborate with each other. Teacher performs the role of guiding students so as to prompt substantive mathematical discussions and scaffold and motivate to establish the linkage with prior and previously existing knowledge. “The motivated students in such environment are likely to learn collaboratively and develop more robust mathematical identities”. (Marshman & Grootemboer, 2012, p. 148).

Even appreciative practices value each of the minute details and represent the minorities as well. None of the positive mathematics values and practices is left behind. Hence it is democratic in nature. Therefore it is essential for maintaining democratic practices inside the mathematics classroom and the appreciative inquiry helps for that.

Challenges of Appreciative Inquiry in Mathematics Classroom

Any analysis of mathematics education in our schools will identify a range of issues as problematic. We structure our understanding of these issues around the following four problems which we deem to be the core areas of concern:

Fear and Failure

Mostly the teachers are habitual on finding negatives on students and their failures. They regard them as essential aspect of mathematics learning and argue that if the students gradually reform their negatives and cover their failures with the successive successes, they will be able to achieve mathematics learning objectives. This way negatively based mathematics learning approaches become the hindrances for implementing appreciative Inquiry inside the Classroom.

If any subject area of study evokes wide emotional comment, it is mathematics. It is quite the social norm for anyone to proudly declare that s/he never could learn mathematics. While these may be adult attitudes, among children (who are compelled to pass mathematics examinations) there is often fear and anxiety.

Teacher Kafle said,

“Mathematics anxiety and ‘math phobia’ are terms that are used in popular literature. In the Nepalese context, there is a special dimension to such anxiety”.

The teachers even believe and follow punishment as the tool for achieving mathematics learning objectives. The belief is widespread among the teachers, students, administration and stakeholders that mathematics learning can only be supplemented by strict rules and rigorous discipline within the classroom. Mathematics learning and mathematics achievement are often linked to reciting the formulae and using them in solving the problems. If the students fail to do so, punishment, corporal or psychological, is regarded as the catalyst to enhance the learning activities.

Students face many problems during mathematics learning and seem to be guided by different phobias related to mathematics learning. Such phobias are sometimes transferred as a culture and sometimes as acquired experiences. Many

times students' fears against mathematics learning even enhance the phobias and failures, which their close friends and family members have experienced. Related to this, mathematics student Rasmi shared one of the in formations about her,

“I am not an additional mathematics student. Initially, I was interested to study that but my elder sisters restricted me. They had chosen mathematics as an additional subject but they could not perform better in SLC examination. This way their experiences and low performance did not let me choose mathematics as the additional subject.”

So it seems to be essential to make individual counseling so as to maintain their interest in mathematics learning, avoid their phobias and increase their mathematics performances and achievements. Many times students' mathematics learning is affected by different factors, extraneous to education system. In such cases, teachers and the related stakeholders need to make essential effort and provide individual care to the students.

With the universalization of elementary education made a national priority, and elementary education a legal right, at this historic juncture, a serious attempt must be made to look into every aspect that alienates children in school and contributes towards their non-participation, eventually leading to their dropping out of the system. If any subject taught in school plays a significant role in alienating children and causing them to stop attending school, perhaps mathematics, which inspires so much dread, must take a big part of the blame. Such fear is closely linked to a sense of failure. By Primary level, many children start seeing themselves as unable to cope with the demands made by mathematics. In high school, among children who fail only in one or two subjects in year-end examinations and hence are detained, the maximum numbers fail in mathematics. This statistic pursues us right through to Class X, which

is when the Nepal state issues a certificate of education to a student. The largest numbers of Board Exam failures also happen in mathematics.

Disappointing Curriculum

While interviewing the teacher participants and the mathematics professionals, they complained about the complex and larger syllabus in Nepalese secondary level mathematics curriculum. Teachers argued that, though they want to conduct their mathematics teaching in different teaching methodologies, curriculum forces them to follow traditional Problem Solving Approach. They put forward several reasons for that.

They argue that as most of other teaching methodologies are time consuming than Problem Solving Approach, they would be unable to complete their course on time. The syllabus usually is very vague and teachers often feel problem to construct mathematics knowledge on students inside the classroom and relate their learning with daily life experiences. Similarly, they even complained about the central tendency of curriculum in which the teachers hardly find their space to contextualize mathematics teaching inside the classroom. Teachers even hardly get opportunities to build their own syllabus on their own and to choose the textbooks according to the students. Usually the term-wise syllabus breakdown and textbooks are imposed by the different examinations boards and different clusters of schools. In these situations, it becomes harder for the teachers to implement Appreciative Inquiry in mathematics classroom.

Also often examinations are held from the external authorities and mathematics learning achievements are usually evaluated by the external authorities, mainly based upon marks achieved. Similarly, the evaluation systems primarily focus

on Problem solving methods. In these situations, the mathematics teachers feel harder to run their class so as to construct mathematics knowledge in students.

Crude Assessment

We talked of fear and failure. Most of the problems cited to the tyranny of procedure and memorization of formulas in school mathematics, and the central reason for the ascendancy of procedure is the nature of assessment and evaluation. Tests are designed only for assessing a student's knowledge of procedure and memory of formulas and facts, and given the criticality of examination performance in school life, concept learning is replaced by procedural memory. Those children who cannot do such replacement successfully experience panic, and suffer failure.

While mathematics is the major ground for formal problem solving in school, it is also the only arena where children see little room for play in answering questions. Every question in mathematics is seen to have one unique answer, and either you know it or you don't. In Language, Social Studies, or even in Science, you may try and demonstrate partial knowledge, but (as the students see it), there is no scope for doing so in mathematics. Obviously, such a perception is easily coupled to anxiety.

Amazingly, while there has been a great deal of research in mathematics education and some of it has led to changes in pedagogy and curriculum, the area that has seen little change in our schools over a hundred years or more is evaluation procedures in mathematics. It is not accidental that even a quarterly examination in Class VII is not very different in style from a Board examination in Class X, and the same pattern dominates even the end-of chapter exercises given in textbooks. It is always application of some piece of information given in the text to solve a specific problem that tests use of formalism.

As discussed earlier, the evaluation systems seem to test, what the students don't know? The evaluation systems are generally based upon the tougher examination questions and promote negative impacts in examination appearing students. This way, the evaluation systems themselves are conducted against the Appreciative Inquiry Approaches. For these children, what the curriculum offers is a store of mathematical facts, borrowed temporarily while preparing for tests. By not offering conceptual depth, by not challenging them, the curriculum settles for minimal use of their motivation. Learning procedures may be easy for them, but their understanding and capacity for reasoning remain under- exercised.

Unwilling Teachers and Time Factors

Interviewing teachers and mathematics personnel, it is known that mathematics teachers mostly regard the newer mathematics teaching methodologies hectic and are found to be reluctant to adapt that inside the classroom. Teacher Kafle said,

“Many mathematics teachers has trained in using ICT and different newer pedagogical practices in mathematic teaching. But while following up, most (almost all) of them seemed not implementing them in classroom teaching. They complained on various matters but I found them lacking will.”

But, teachers complained that to adapt newer teaching methodology inside the classroom, they had to make plenty of exercise before they entered the classroom, which was almost impossible for them. Mainly they failed to manage time to prepare properly.

Mathematics teachers are mostly considered and found to be busy from early morning to late evening, in their private tuitions and coaching. Also during day time, most of the mathematics teachers in Bhaktapur has to run to three or more schools on

an average. In such a situation, teachers have almost failed to manage time to explore the positives in students, search for the dreams and design the learning activities so as to achieve the desired goals.

Different mathematics teacher trainings were found to address different appreciative activities in their training programs, but teachers are hardly found to implement them while teaching mathematics. The lacking following trainings and other different factors can be regarded as the reasons for that. Likewise, it becomes much easier for the teachers to teach by one way for many years and many classrooms rather than designing teaching activities differently for different years and different classrooms, depending upon the needs and potentials of the students.

Classroom Environment

Mathematics teachers often complain their school administration and the guardians, as the hindrances for implementing different newer teaching methodologies in their teaching. They often complain that, school administration usually disturbs them in bringing structural changes in mathematics teaching and often does not make the arrangements of the necessary equipments and facilities. The unhealthy competition in between the schools promotes just marks achievement.

Mathematics practices in different schools seem to worry on, how students obtain more. not upon, how the students construct knowledge and make meanings. Mathematics teachers regard administrative reluctance as the major affecting factor. Lacking continuous assessment system, huge numbered classroom, unnecessary upgrading of the students and marks based evaluation system are the different aspects that the school administrations need to ponder over for successful implementation of Appreciative Inquiry in mathematics teaching.

Similarly, the guardians are even often found to be reluctant against Appreciative Inquiry for mathematics teaching. Many guardians still consider corporal punishment and marks as the tool for gaining mathematics achievement. Even successful implementation of Appreciative Inquiry in mathematics learning requires necessary support and participation of parents in home. In such cases, Appreciative Inquiry is found failing to bring about the expected mathematics learning achievement.

Noisy Classroom is another challenge for implementing appreciative inquiry in classroom. Appreciative inquiry promotes discussions and discourses among teachers and students and students and students and the classroom environment is likely to be noisy. But Nepalese practices do not regard noisy environment as good for learning and that may not be supported by different levels of authorities. Then lack of physically well equipment class and modern technological material are another problem of almost all Nepalese school.

Chapter V

SUMMARY, FINDINGS AND CONCLUSION

In this chapter I have presented whole finding of my study and discussing some of points. The data are collected through in-depth- interview, observation and focus group discussion. Since my study had limitations due to economic conditions and time boundary. I didn't include all of my findings from my field visits. My main purpose is to create appreciative pedagogy and how to use appreciative inquiry in mathematics teaching.

Summary

The Appreciative Inquiry process is a valid way to help people to see what they are good at and to build on those areas. For data collection, I conducted Focus Group Discussion among the mathematics teachers; interviewed teacher participants, student participants and collected data through field observations as well. Using Appreciative Inquiry in a classroom is difficult to do. I found that it was difficult to use Appreciative Inquiry in a classroom where not all of the students were equally invested in their learning or in the goals that were set. The students would need to take an invested roll in the planning and sustaining of the Appreciative Inquiry process in the classroom in order to make it successful on a longer scale

Findings

From focus group discussion, participant interviewed, and frequent class observation I tried to explore their perception and practice of Appreciative Pedagogy in mathematics classroom. Also I focused on exploring the possible opportunities and challenges of the same.

The major findings of the study are as follows:

-) Appreciative inquiry was good and expected for teachers to equally treat all the students inside the classroom, value them and their ideas, knowledge and success; positively reinforce and reward; and involve them in designing classroom learning.
-) Students expected several activities other than classroom teaching, for their mathematics learning, they seemed to enjoy and admitted to learn more through project works and hands-on activities.
-) Students' sitting arrangements were made so as to promote peer-learning. In formal discussions with some of such students, they shared that they were improving their mathematics learning and achievement level, after they started enjoying peer-group learning.
-) Teachers apply democratic practices like contextualization by giving relevant examples and extended support to the needy students while teaching and also try to establish better teacher-student relationship inside and outside the classroom.
-) Some teachers are found to directly apply the formula and direct students accordingly. Only one teacher seemed to use geometrical instruments while teaching geometrical constructions.
-) Teaching learning process through appreciative inquiry is more effective and fruitful than traditional teaching learning method.
-) Perception of the entire teacher agreed that appreciative pedagogy would contribute in mathematics learning and achieving learning achievement.
-) Classroom environment, administrative authorities, curriculum and evaluation methodologies are the challenges of implementing the appreciative inquiry in the mathematics classroom.

-) Teacher appreciate students by value their perception, prior knowledge, use positive behavior and words, to apply locally available resources in teaching learning process.
-) Appreciative inquiry motivated to teachers and students by using innovative, inquiry and interaction based classroom.

Conclusion

In conclusion, the purpose of this study was to help students identify their unique strengths through an Appreciative Inquiry process, and to see if emphasizing their strengths would increase student success and motivation. These activities that the students participated in required a catalyst and frequent activities afterwards that continued the success and to fuel further learning and strengthening of the students innate abilities. As discussed in earlier chapters, in the examination they ask what the students don't know. Even the students are forced to exhibit their knowledge on what the teachers expect, not how do they perceive knowledge. In such a situation, it was obviously strange for teacher to understand the pedagogy, which seeks the strengths and potentials of the students.

Being much habituated with and a part of teacher-centered classroom planning and environment, learner centered teaching approach based on the inherent strengths of students was obviously strange for me. I got really surprised to know that pedagogical designs can be made being based on students' strength and experiences and to understand that past researchers have found that learning achievement through such approaches are even more than through traditional approaches. As a mathematics student and a mathematics practitioner, I had been familiar with many problems related to mathematics teaching and learning. Hence, I decided to carry out my research on mathematics teaching from the perspective of Appreciative Inquiry.

Exploring different perceptions and practices related to Appreciative Inquiry and analyzing that, it is concluded that use of Appreciative Inquiry contribute in mathematics teaching and learning. It even helps for the transformation in ongoing mathematical practices as it is experiences based.

Recommendation

On the basis of findings of the study, some measures have been recommended for the teaching learning activities as given below:-

-) The mathematics teacher should be appreciate to all student who are involving in mathematics learning.
-) The teacher training institutes should focus their attention on appreciative pedagogy in mathematics learning.
-) Curriculum designer, textbook writer should emphasize on grass root approach learning for the appreciate to all who are involved in mathematics learning.
-) Appreciative inquiry is significant for students on their various social practices, and collaborative performances, managerial functions and mathematics learning.
-) Its helps administrators and the educational managers to implement appreciative pedagogy for their activities.
-) This research is confined to the limited location, limited teachers and students. Only such sample could not generalize the entire perception and practice of appreciative inquiry in mathematics learning. Further study should be done on different districts of Nepal, using different research designs, different samples in different topics and in different levels.

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APPENDIX I

Focus Group Discussion Guideline

- a. React of teacher when student are perform or not perform solve the given task.
- b. Teacher student relationship in mathematics teaching.
- c. Teacher availability for students.
- d. Effect of motivation, support, reward, punishment and connection of student prior knowledge in mathematics learning.
- e. About appreciative pedagogy.
- f. Difficulties of appreciative pedagogy.
- g. Practices of appreciative pedagogy in mathematics teaching and its suitable or not.

APPENDIX II

Interview Guideline for Teacher.

- a. Mathematics as social subject.
- b. Mathematics teaching approaches.
- c. Application of different methods in mathematics learning.
- d. Reinforcement and mathematics achievement.
- e. Mathematics and daily livelihood.
- f. Teacher reaction and student achievements.
- g. Appreciative inquiry and mathematics teaching.
- h. Effectiveness of appreciative inquiry and its opportunities.
- i. Challenges of appreciative inquiry in mathematics classroom.

APPENDIX III

Interview Guideline for Students

- a. Mathematics and other subject learning.
- b. Difference between mathematics and other teacher.
- c. Practices of mathematics teaching and motivation.
- d. Mathematics learning and its links to other subject or daily livelihood.
- e. Mathematics teachers and there value of different student.
- f. Chances for student to generate their ideas.
- g. Remember of any moment after than they started performing better in mathematics.
- h. Mathematics teacher activities and behavior that they like most.
- i. Mathematics teacher and appreciation.

Appendix IV

Interview Permission Form

My name is Janak Basnet. I am doing my M. Ed in Tribhuvan University Kirtipur, Nepal. I am interviewing teachers and students for my research study on Appreciative Inquiry and mathematics teaching. I am interested on exploring their perceptions, practices, opportunities and challenges of Appreciative Inquiry in mathematics classroom. I encourage for your voluntary participation in this research study. You deserve rights to quit your participation at any time. If so, you will never be asked for reasons and considered negatively. Your answers during interviews will not be considered right or wrong. They will be considered as data and treated accordingly. I will record your interviews only after your consents. All the data will be kept safe and confidential. They will just be used for my research purpose and related publications. Pseudo names will be used for related publication purposes. Your authentic names will not be published unless you agree for that.

Participation Agreement:

I agree that this interview is done with my voluntary participation. I know the intentions and objectives of this research study. In case needed, I will quit my participation without any clarification. I possess rights to withdraw the data provided before any analysis, critics and publications. All the data provided will be kept safe unless I agree against that. One copy of this permission form is even provided to me. I had read all the details of this form. I express my consent for my interviews and data analysis, critics and publications.

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Participants' Signature

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Interviewer Signature