

Chapter 1

Introduction

Background of the Study

Mathematics is an important part of the human society. Mathematics came into practice with the beginning of the human civilization. It plays very important role in building up modern civilization. It has been contributed in every aspect of science and technology as well as human daily life to the field of science and technology, music and arts, engineering etc. it is believed that the development of mathematics and development of civilization were occurred together. Mathematics is the way of settle in mind and the habit of reasoning and it is an expression of human minds reflects the active well complete reasons and desires for aesthetic perfection. Mathematics is interpreted, explained and used in different situation to generate logical, intuition, constructivism, analytical, formulation and generalization of judgment power.

Mathematics is considered as one of the most difficult subject. The result of the examination from pre-primary to secondary level itself proves its significance to more extent. However, only few of us realize fact that mathematics is more logical. It is primarily concerned with abstraction, logical reasoning from counting, measurement, calculation and the study of shapes and motions of physical object. It has continuously been developed and improved to meet the changing needs of our contemporary society.

The mathematical process is interconnected within different perspective and values. Problem solving and communicating have strong links to all process. As a student's engaged in reasoning teacher further encourage them to make conjecture and justify solutions orally or verbally. The communication and reflection that occur

during and after the process of problem solving help students not only to articulate and refine their thinking of others and to continuously adjust their own strategies in order to make their solution as efficient and accurate possible (Dawadi,2005). The mathematical process can't be separate from the knowledge and skill that students acquire throughout the course. Students must solve the problem, communicate, reasons, reflect and so on as they develop the knowledge understanding or concepts and the skills requires in the course.

The mathematics discipline is generally regarded as a difficult and tricky subject but is essential for everyday life and for higher studies especially in the field of science and technology. The mathematics involved in developing theory and want to abstracting it to other disciplines and fields. But the mathematics education explains about the application of theory in every field of human beings. Going together both played a very important role in building up modern civilization by perfecting all sciences.

Mathematics education is a modern discipline in the world. In the beginning it was thought that mathematics and mathematics education were same discipline. Now, mathematics and mathematics education by nature are considered as the two distinct disciplines. Mathematics education deals with mathematics from the philosophical, psychological and sociological aspect of education. The first international congress of mathematical education held at Lyons in France in August 1969, established mathematics education as a discipline.

Mathematics education is concerned with the development and implementation of appropriate mathematics curricula and with all issues associated with the teaching and learning of mathematics in keeping with the concept of lifelong learning, mathematics education covers learners of all ages and at all levels from early

childhood to adult. Thus mathematics education is not concerned with curricula, classroom, teachers and learners in the school and schools, nevertheless, issues associated with school mathematics will be major focus. Hence mathematics education is the study of practice and method of both teaching and learning of mathematics.

About the aspect of teaching Bhatia and Bhatia (1997) said “Teaching is establishing a harmonies relationship between teacher, pupil and subject”. So that three dimension of teaching are pupil, teacher and subject. It is giving useful information it is causing the child to learn. It is the stimulation and direct of learning. It is helping for the child to make effective and easily adjustments, it is guiding for the pupil activity and it is training of his emotions.

About the pedagogical significance of physical setting, Goetting (1941) said “The physical setting of the classroom can be justified also on pedagogical grounds. Physical wellbeing and comfortable and pleasant working conditions are essential to satisfactory achievement of pupils. Maximum mental efficiency requires physical wellbeing of public maladjusted furniture; abnormal conditions with respect to lighting, temperature, and humidity in the classroom make discomfort, inattention, and lower standards of work classroom atmosphere which as an unconscious, but nonetheless real influence upon school work is partly physical in nature. Neatness and order in the arrangement of the classroom, as well as attractiveness in its color scheme and artistic appointments are definitely known to influence morale, discipline and efficiency of pupil’s achievement.

In our country, textbooks are used as only the major tools to achieve the objectives of the curriculum. So that, many teachers have misconception about the textbook and curriculum. Because of the financial problems, rules and regulations,

lack of training, lack of opportunity etc. Our school couldn't proceed and afford money to spend in materials and equipment's. Facilities that are essential for teaching and learning activities are not in substantial amount. Some school and college do not even have enough classrooms. They don't have opportunity to take on a sit. In this complicated situation, how the learners learn? Often the classrooms are not well lighted and well ventilated. Also on the rural area teachers have limited on only in the textbooks. They haven't participated on the different Mathematical program, and don't familiar with the modern technologies. So, the teachers haven't understood the interest of the students. They follow only the traditional approaches and faced the different problems such as: well management of the classroom, use of instructional materials, textbook and curriculum, strategy of teaching, evaluation system and so on.

Many government and nongovernment official research indicate huge amount of time and a lot of money have been spent to find the problem of teacher, but no satisfactory result was found. The purpose of the present study was to explore the types and extents of problem faced by teachers in executing instructional activities in mathematics classes of the Secondary level in the districts of Lamjung. So this study is concentrated on exploring the problems they face while teaching mathematics on secondary level in Lamjung district.

Statement of the Problem

Teaching mathematics meaningfully is very difficult and challenging job. Mathematics teachers must be well trained and should have deep understanding in contents. There are many problems which should be overcome by mathematics teachers in general. There are many problems faced by mathematics teacher and the learner. According to the census 2068, there are 125 ethnic groups, more than 123 language group and so many cultural groups are there in our country. So Nepal is

diversified country. To teach mathematics in a diversified in classroom meaningfully is very challenging task. Previous researcher shows that the mathematics classroom is full of students from different cultural, lingual, ethnic and intelligence groups. On the other hand, there is a lack of resource materials like textbooks and instructional materials. To overcome these issues many studies have been made but no one found to be valuable. This study concerned with the problem faced by secondary level mathematics teacher at Lamjung district. So this study intended to answer the following research questions.

- What are the current problems faced by mathematics teachers in teaching mathematics at secondary level?
- What are the causes that the mathematics teachers faced in teaching mathematics at secondary level?

Objectives of the Study

The objectives of this study were;

- To identify the problem faced by secondary level mathematics teacher in teaching mathematics.
- To analyze the causes of arising such problems faced by mathematics teacher in teaching mathematics at secondary level.

Significance of the Study

Mathematics has been taught as compulsory subject up to secondary level of school education program. It is the optional subject for the secondary level at present but it will be compulsory subject for this level. Even mathematics has been taught as compulsory subject there may be many factors that hinder student progress in this subject. One of the main factors of this reason may be problem of teacher in teaching mathematics. Problem is not limited on the problem it may arise because of

confusion about subject matter, lack of physical infrastructure, teacher training, economically poor condition, rule of educational policy any how to make the pass policy, confusion to find the difference between textbooks and curriculum, lack of special subject teacher. This study may provide some logical and valuable information about the current problem of teaching mathematics faced by mathematics teacher at secondary level on Lamjung district. Thus the study is significant for the reason that it helped to provided information for the concerned agencies to refer and improve the mathematics teacher at secondary level.

The following are the significance of this study

- It would be helpful for untrained teacher as well as trained teacher to improve their skill to teach mathematics.
- It would be helpful to curriculum planner, policy maker, administrator and educationalist to make further policies, rules and regulation.

Delimitation of the Study

The delimitation of the study was as follows.

- This study was concerned only with classroom teaching problem on secondary level mathematics teachers.
- This study was based on the sample of fifty secondary level mathematics teacher of Lamjung district.
- This study was delimited on 25 public and 25 private school of Lamjung district.

Definition of the Related Terms

Secondary school mathematics teacher: The teacher who teaches mathematics at grade **IX** and **X** on Lamjung district where considered as secondary school mathematics teachers.

Trained teacher: The teacher who have passed bachelor or higher level in mathematics education or have taken 10 months special training provided by MOE or NCED or FOE or other authorized institutions are defined as trained teachers.

Untrained teacher: The teachers who have bachelor or higher level in any faculty of mathematics except education faculty have not taken at least 10 months special training provided by MOE or NCED or FOE or authorized any other institutions are defined as untrained teachers.

Training: It is generally focused on preparing a teacher in specific areas such as use of classroom aids and resources, effective teaching techniques, conducting group and pair activities, use of textbook, classroom management and constructing text items.

Problem:The difficulties of teaching contents of mathematics, while teaching in classroom of class **IX** and **X**.

Chapter II

Review of the Related Literature

This chapter deals with the review of other related literature about facing problems concerning with teaching instructions, method and materials, classroom management, teachers and student characteristics on teaching activities. The researcher has reviewed some related literature are cited below.

Pandit (1999) mentioned on an article “Problem faced by mathematics curriculum on three years B.Ed. level mathematics curriculum in Nepal”. He concluded that mathematics teacher education program in Nepal is disturbed by so many factors such as lack of lectures involvement in curriculum planning, lack of efficiency to conduct teaching facilities, students weak background in the subject matter, lack of opportunity given to upgrade their knowledge and huge number of personal problem of lectures.

Lamichhane (2001) did a survey type research on “A study of problem faced by the secondary level mathematics teacher in teaching mathematics” in Kaski district. He concluded that several problems proposed up in the eyes of teachers such as inadequacies of textbook and teachers guide, lack of instructional materials, lack of teachers training, lack of supervisory help, lack of physical facilities etc. further work he concluded that the lack of motivation of learning mathematics is poor on the part of students.

Thapa (2005) conducted a thesis entitled “A study on the problem faced by teacher in teaching mathematics at primary level” she concluded that teacher are facing many problems due to large class size, irrelevancy of teacher guide, lack of instructional materials, lack of supervisory help and so on. In many mathematics teaching, teaching techniques are such aids which are used to make the lesson

interesting, to explain the content and to remember it by heart during teaching techniques. Teaching or instruction strategies refer to a pattern of teaching acts that serve to attain certain outcomes and to guard against others. There are several methods of students and some are emphasizing in the supreme source to as a teacher. Among them inductive method, discovery method, filled trip method, discussion method, heuristic method, project method, etc. are the students centered methods, which always emphasizes on the active participation of the student.

Nepal (2010) conducted a thesis entitled “A study on the problem faced by mathematics teacher in teaching mathematics at secondary level of Palpa district”. He focused on identifying the problem and cause of problem on teaching mathematics. He concluded that there is lack of classroom management for the mathematics training due to the large number of students, lack of moral education, books are not available in time and students are interested in political program. There is no sufficient mathematics teaching materials, teachers are not using available materials, there is lack of participatory approach of students and teacher both in classroom, lack of confidence of teacher, lack of irregularity of homework checking, lack of appropriate teaching method, mostly used lecture method, etc. are some of the problems that the difficulty is faced while teaching and learning geometry, arithmetic, probability and algebra.

Khanal (2012) conducted a thesis entitled “A study on the problem faced by mathematics teachers in teaching mathematics at Secondary level”. He concluded that most of the problem arises because of large class size, irrelevancy of teacher guide book in the sense of teacher need, lack of instructional materials, adequacy of teacher training, lack of supervision, lack of physical facility, etc. are the major problems faced by the Mathematics teacher.

Marasini (2008) conducted a thesis entitled "A study on problem faced by students and teachers in the implementation of mathematics curriculum grade VIII". The conclusion of his study was the subject matter included in the mathematics curriculum of grade VIII are not suitable for the levels of the students and it is difficult to implement the subject of the curriculum and also there was vital problems on technique of teaching, teaching method and materials, curriculum and textbook etc.

Gautam (2009) described a thesis entitled "A study of problem faced by higher secondary school teacher in mathematics". The research design was qualitative; the population for the study was considered to be all Mathematics teachers, who have been teaching Mathematics in the Nawalparasi district in the grade XII. Eight teachers were chosen as a sample from 8 different colleges, 4 colleges were from rural area and from urban area. The teachers were chosen by purposive sampling method. A questionnaire consisting of fifty two items developed by the investigator was finalized in consultation with Mathematics experts and supervisor. The collected data were analyzed and interpreted by the statistical tools like mean weightage. He concluded that the prescribed curriculum and the existing textbooks are not well-managed, not ordered in simple to complex sequences. Practical problems are not well managed, not much applicable or appropriate, they are neither analytical nor numerical in nature, objectives are good but the need to Mathematics others classroom activities are poor. Language problem, poor economy, lack of refreshment training, examination oriented teaching, quality and size of blackboard, sequence of presentation and Mathematics laboratory were the burning problem faced by mathematics teachers in their teaching profession. Comparing those problems between public and private college teachers in Mathematics, it was found that public and private school teachers faced similar kinds of problem.

Acharya (2006) conducted a research entitled 'A study on the problem faced by higher secondary level mathematics teacher in teaching mathematics of grade twelve. He summarize that the prescribed curriculum and the existing textbooks are not well planned, sequential and practical problem well. It also concluded that trained and untrained teachers, both are facing similar types of problem on Kathmandu district.

Theoretical Understanding of the Study

This study had focused to identify the problem and the causes of problem on teaching mathematics. From the study related literature above, the researcher made the understanding of the study.

Classroom Management

The major factors related to classroom management are physical environment of the classroom, teachers attitude, class size, classroom discipline, teacher-student relationship etc. the level of classroom management significantly affects the learning process on mathematics.

Teaching Methods and Materials

Teaching method and materials are the main ways for meaningful teaching and learning of particular topic. Teacher is the main agent of the teaching methods and materials. In classroom activities, teacher and students has vital role for the use of materials. The method of teaching should be based on knowledge, understanding, skill and application.

School Administration

The school administration had the major role of maintaining good learning environment by providing good physical resources, organizational discipline and solving the causal problems which can hamper the learning process. If school

administration becomes weak the learning environment deteriorates and we cannot expect the good result.

Mathematical Content

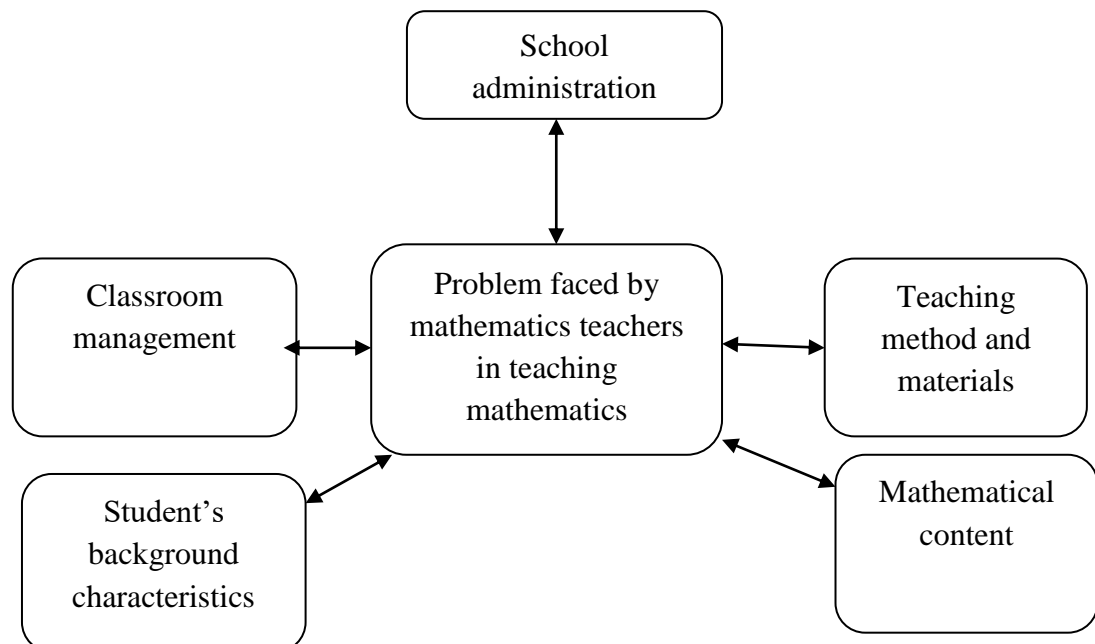
The mathematical content are Number and algebra, Measurement and Geometry, Statistics and Probability. They describe what is to be taught and learnt. Contents are designed after the information of the objectives of the curriculum; contents are organizational form of skill, attitude and concept marked by the objectives.

Student's Background Characteristics

Different students may have come from different environment and different background. If any student has strong background he can learn many things easily compared to the student with low background. The teacher's quality can be seen by observing how he is making the students with low background learn well.

Conceptual Framework of the Study

This study had focused to identify the problem and the causes of problem on teaching mathematics. From the study of related literature above, the researcher made the framework for this study. So, this study had related to the following framework.



Although mathematics is a subject of interest for many schools, it is not easy to teach and learn. We should struggle with various problems to overcome through the problem. Learning mathematics means getting ability to solve problems. Various techniques appeared and disappeared to handle the problem at time to time but no one is complete. The major factors related to classroom management are physical environment of the classroom, teacher's attitude, class size, classroom discipline, teacher – student relationship, etc. The school administration had the major role of maintaining good learning environment by providing good physical resources, organizational discipline and solving the casual problems which can hamper the learning process. The mathematical contents are algebra, measurement and geometry, and statistics and probability. Different students may have come from different environment and with different background. If any students have strong background he can learn many things easily compared to the student with weak background.

Chapter III

Methods and Procedures

This chapter deals with the procedure of the study. It determines how the research becomes complete and systematic. The method applied in this study as discussed in the following sections: research design, population of the study, sample of the study, source of data, tools/instruments, data collection procedure, scoring procedure and data analysis procedure.

Research Design

Research design is an important part of the research. So, it is called as heart of the research. A good research depends upon design of the study. This is a survey research to investigate the problem faced by the secondary school mathematics teacher in teaching mathematics. For this study, fifty secondary level mathematics teachers from Lamjung district were selected with one teacher from each school by the method of simple random sampling techniques were considered as sample of this study. Out of 50 teachers, 25 teachers were selected from the public school and 25 teachers were from the private schools.

So, both the quantitative as well as qualitative techniques were use in this study. This conducted under the problems faced by teacher in teaching mathematics at secondary level.

Population and Sample

To determine the population, select the proper sample is very challenging task in research study. Population is the overall unit of the study and sample are the small portion of the population. All the mathematics teachers who teaches mathematics in secondary level of Lamjung district in academic year 2072/73 were population of the study.

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Research Tools

Constructing a research tool is the first practical step in carrying out the research process. A researcher decided how he/she were collects the data then should construct a research instruments for this. Questionnaires, interview schedule, observation forms are the key tools to collect the data on survey research. The research tools may vary according to the nature of the study. There is different research tools used in qualitative and quantitative designs. I have decided to construct and use the following research tools.

Questionnaires

The questionnaire was developed by researcher himself with the help of supervisor. The questionnaire was constructed after the detailed study of related literature such as articles, documents, thesis and framework of the study. Before developing the questionnaire researcher were consult with mathematics experts and other mathematics teacher at school. The questionnaire consisted of 20 statements pertaining problem was faced by the mathematics teacher and each statement followed by ranked responses in the five point of Likert Scale. The statements of the questionnaire was constructed in such a manner that they could find out the problem of teacher while teaching mathematics. The areas of the problems were related to the classroom management, mathematical instructions, methods and materials.

At the end of each section of questionnaire the researcher requested to comment to the additional areas not covered by the items of the questionnaire(See Appendix A)

Interview Guideline

This tool was used for the qualitative information. Ten teachers were interviewed for this purpose. After collecting the data from questionnaire, the researcher was selected the teachers for interview. The open ended question was asked them with the help of interview guidelines that was developed by the researcher himself with the help of supervisor. Interview guidelines was constructed in such a manner that they could find out the problem and causes of problems related to the classroom management, mathematics instruction, method and materials, teachers and students characteristics and teacher training and its transfer in classroom teaching. (See Appendix C)

Classroom Observation Form

Observation is also an important tool for data collection so the researcher applied this tool for data collection to find out situation of using instructional plan in problem faced by mathematics teacher at secondary level. Observation was done for mathematics teacher. (See Appendix B)

Sources of Data

Both primary and secondary data were used in this study, secondary data was used for understanding of the passed research study related to this study of the literature section but primary data were the main source of the analysis and interpretation of the result of study, which was carried out through questionnaire, interview guideline.

Primary Data:

The primary data will be the main source of the study, which will be obtained by interviews, questionnaires and the result of classroom observation form.

Secondary Data:

Some secondary data will be used for the understanding of the past research study related to this study of the literature section.

Scoring Procedure

For the analysis of items, weightage of 5, 4,3,2,1 (Likert Scale) were assigned to a statement and were stated “Strongly agree”, “Agree”, “Undecided”, “Disagree”, “Strongly Disagree” respectively. For the statements opposing to this point of view, the items were taken in the opposite order. Mean weightage was calculated for each statement. If the calculated index is greater than three then it were concluded that the statement continent in strong favor to the problems. If the index measure is less than or equal to three, then it weak favor to the problems.

Data Collection Procedures

For data collection, the researchersvisited each of the sampled school along with questionnaire, observation form, interview schedule and request letter from T.U. to render any help needed to the researcher form the school administration. The researcher in his present requested each of the sampled teachers of the school to fulfill the questionnaire honestly.

Data Analysis and Interpretation

The obtained data were analyzed and interpreted with the help of following statistical techniques and explanation methods.

Mean weightage was used to locate the central position of the responses to the statements. The average mean weightage was calculated as follows.

$$\text{Weighted Mean} = \frac{\text{Total Rank Score of a statement}}{\text{Number of Teacher's Responses}}$$

It used to locate the central position of the response to the statement of teachers as a whole in the rating scale, if the calculated index is greater than three then it is concluded that the statement indicates the problems and it is strongly favorable to it. If the mean weightage is less than or equal to three then it is less favorable to the problems.

The collected data through interview schedule and classroom observation were analyzed and interpreted on the basis of the framework that the researcher had already developed in the review of the related literature section. i.e. the information were categorized in the broader themes area that are economic crises of school, lack of proper classroom management, lack of motivation, lack of encouragement, lack of appropriate teaching method and materials, lack of teacher training, lack of supervisory help, lack of facility and large class size. Then they were analyzed along with triangulation among three sources i.e. observation, interview and questionnaire. The researcher tries to interconnect with previous findings and the way of analysis in the similar context. The validity and reliability of this study were maintained through cross matching or triangulation.

Chapter IV

Analysis and Interpretation of Data

In this chapter, the collected data were analyzed and interpreted. For the collection of data, the questionnaire, classroom observation form and interview schedule were used by the researcher for the purpose of the study. In the questionnaire, 20 questions were asked to the teacher. The collected data were tabulated and analyzed according to the objective of the study. The tabulated data were statistically analyzed and interpreted by using Likert Scale of mean weightage. These data were calculated itemize in the various problems faced by teachers related to mathematics teaching at secondary level of Lamjung district.

The researcher used class observation form to observe the classes in 4 schools, out of them two schools were public and two were private schools of Lamjung district. Direct observation was done in the classroom and the classroom behavior was carefully observed and noted down by various outlook of setting. With the help of interview schedule, the interviews were taken with mathematics teacher. The interaction with the respondents was carefully listed and noted properly. The collected information was categorized according to the category of the respondents and then different views were given in the text of interview or the observation note. His/her perspective, experience, gesture were also analyzed.

The whole data were categorized into five groups. These are classroom management, teaching method and materials, school administration, mathematical content, student's background characteristics, thus the collected data information were analyzed and discussed under the following topics.

- Problem related to classroom management.
- Problem related to teaching method and materials.

- Problem related to school administration.
- Problem related to mathematical content.
- Problem related to student's background characteristics.

Problems Related to School Administration

School administration plays a vital role to construct necessary instructional materials. But if it seems to be passive and irresponsible then teacher face many problems on teaching-learning process. For the understanding of the problems related to school administration, the researcher raised five questions. These five questions and their mean weightage are tabulated below:

Table: 4.1 Mean weightage of teacher's response on problems related to school administration

| S.N. | Statement | Mean Weightage |
|------|---|----------------|
| 1. | Here is compulsion to take more classes because of low number of mathematics teacher. | 3.2 |
| 2. | Irresponsible administration to manage and construct necessary teaching materials. | 3.6 |
| 3. | Lack of refresher training to teach difficult and rigor topic creates problems on teaching mathematics. | 3.3 |
| 4. | Lack of facilities and reward for the good performance creates problems on teaching mathematics. | 3.4 |
| 5. | Library facility is available. | 3.7 |

The information of the above table shows that the weighted mean of first statement that compulsion to take more classes because of low number of mathematics teacher is 3.2. It means that they have class load because of low number

of mathematics teacher. The mean weightage of second statement irresponsible administration to manage and construct necessary teaching materials is 3.6. It specified that there is a problem. It means school administration is irresponsible to manage and construct necessary teaching materials. The mean weightage of third statement lack of refresher training to teach difficult and rigor topic is 3.3. It shows that there is a problem on refresher training to the mathematics teacher. Teacher needs refresher training time to time for difficult and rigor topics to foster a good education. However, during the research it had been found that most of the teachers were not getting such type of training.

To attract teachers toward teaching, they need good facilities and rewards for good performance according to their subject. But they were not getting such facilities as they respond. The mean weightage of the 4th statement that lack of facilities and reward for the good performance is 3.4. It means this statement is favorable on the problem. On the 5th statement about the library facility, most of the teachers stated that the provision of the library facility was not satisfactory at all whereas a few teachers opined that the facility is agreeable in their respective schools. A response position corresponding to 3.7 in the rating scale, indeed, indicate that the library facility not adequate at all.

From above analysis of school administration, it is found that there are many problems related to school administration that hinders teacher attraction on teaching and then directly affects the student achievement on mathematics. So school administration should be serious and responsible to address the problem of teachers.

Due to the lack of mathematics teachers we are unable to conduct extra classes, so that especially the poor students are affected. Moreover, unavailability of

mathematics library is another problem to provide the new mathematical concept and ideas for the student. (Teacher)

From the class observation I have found that there are many problems related to school administration that hinders teacher's attraction on teaching and then directly affects the student's achievement on mathematics. So school administration should be good and responsible to address teacher's problems.

Problem Related to Classroom Management

The classroom is the major sources of knowledge in formal education system in our country. Both teachers and students depend upon bookish knowledge which is used to exercise in the classroom. Not only mathematics, all teaching/learning process is carried out from indoor/closed environment, this is the characteristics of Nepalese education system.

For the understanding the problems in classroom, the researcher raised the five questions like unavailability of mathematics lab in school, in adequate of physical facilities in school, difficulties completion of course taught by using teaching materials on time, teachers difficulties due to large number of students in a single class, boredom felling in mathematics class by students. These are the area of problem of classroom management. For the effective mathematics teaching, the classroom environment should be appropriate and proper environment should be maintained as the size of classroom according to the number of students, physical facilities etc. Now, the researcher tried to elaborate the following problem in detail related to the classroom management.

Table: 4.2 Mean weightage of teacher's response on problem Related to Classroom Management

| S.N. | Statement | Mean Weightage |
|-------------|--|-----------------------|
| 1. | The unavailability of mathematics lab creates problem in teaching mathematics. | 4.2 |
| 2. | Adequate physical facility enhances mathematics learning. | 3.6 |
| 3. | Difficulties in completion of course taught using teaching materials on time. | 2.6 |
| 4. | Large number of student in a single class creates problem in teaching mathematics. | 3.4 |
| 5. | Boredom felling in mathematics class by students. | 2.1 |

The above table shows that there was a problem in using mathematics lab because there was not separate mathematics lab in selected school. The 1st statement is the unavailability of mathematics lab creates problem in teaching mathematics is 4.2. The teachers didn't have any experience about mathematic lab. The better result was assumed by the use of mathematics lab in school but not practically yet. So it is concluded that teachers were blind in using teaching materials in classroom teaching.

The 2nd statement was focused on the problem of physical facility of school. The sampled school was not facilitated as the requirement of the educational environment. There was only single room for each class means no other facilities found in the school. They had to squeeze in a single room like buffalos in cupboard. There were no other facilities which help them to learn more in proper environment. Although students were interested in learning new mathematics problem solving,

there must be sufficient physical facilities that support them learning effectively in school. The mean weightage of teacher's response about physical problem of school was 3.6. The congested room, lack of sufficient furniture, extra room, playground and audio/video room were the physical problems in school. In these records, the teachers were responded as:

All the facilities of school depend on the economics status. Now we are going to fulfill the crisis by collecting money through Ghar-dailo and Deusi-Bhailokaryakram. In future, we hope to manage required physical problem. (Teacher)

The above views of teacher indicate that there is a lack of financial resource. The aim of school administration is to manage required facilities of school in future. There was other problem related to classroom management, which was a difficulty in completion of course by using teaching materials on time. The mean weightage of this statement was 2.6. This shows that most of the teachers are not agree with this problem. They said that if school administration and teacher have willed then course can be completed on time. Eventhough, I found that they are not using teaching materials properly.

The mean weightage of the problem of being large number of students in single class was 3.4. It shows that there was problem in classroom and was difficult to expect high performance in the examination in mathematics subject.

In this regard, teachers have problem to control the classroom. Their maximum effort was to control the class. It was being difficult to promote individual student who needs teacher's supports. The teacher's responses as:

Having large number of students in a single class is difficult to handle. Teaching learning activities are affected by unusual activities (such as sight talk,

tease each other etc.) held by students in the class. It creates unnecessary tension in the classroom. (Teacher)

The above view of teacher's show that the administration should re-think seriously about the problem of teachers and students in school. The school management and teachers should manage the proper classroom environment. They have to give feeling that they all are their friends and they not here to tease each other. Also teacher should have to create such environment that erases the fear from students mind. Then after they can complain to their teachers and school administration.

Similarly, the mean weightage of boredom feeling in mathematics teaching by students was 3.1, which is favorable to the problem of boredom feeling in mathematics teaching. This shows that unnecessary behavior of students create boredom in the class. Most of the students take mathematics is a hard subject and they just think how to pass this subject, so they don't take it seriously.

Administrative co-operation in mathematics teaching is being crucial aspects for the achievements of the students. As response of the teacher, no friendly relation was found in the school. The sincerity of mathematics subject could not be found by the school administration. The teaching materials, mathematics lab, and other facilities were not managed by the school administrators that caused the problem to the teacher as well as students. If students failed in the examination the administration and parents use to blame the teachers. This was the bitter truth of the school mathematics teacher.

Problem Related to Teaching Method and Materials

Teaching material and methods are important part of the successful/meaningful teaching learning process. Teacher is the main agent of the instructional strategies. All the achievement of teaching process depends upon the

teachers. So that teacher's role should be active participation for the effectiveness of learning process. In classroom activities teachers and students have vital role for the use of materials. The method of teaching should base on the knowledge, understanding, skill and application. Also teachers should be concentrating of the need, interest and desire of the students.

For the understanding of the problems in mathematics, the researcher raised five questions regarding instruction, method and materials. The researcher tried to elaborate the following problems in detail related to mathematical instruction, method and materials.

Table: 4.3 Weightage mean of teacher's response problem related to teaching method and materials

| S.N. | Statements | Mean weightage |
|-------------|---|-----------------------|
| 1. | There is a lack of proper space to demonstrate instructional materials. | 3.2 |
| 2. | Un availability of separate room for mathematics instruction as math lab creates problems while teaching mathematics. | 3.6 |
| 3. | The entire mathematics classroom is equipped with a graph board and bulletin board. | 4.0 |
| 4. | Un availability of teaching machine and computer creates problems while teaching. | 3.8 |
| 5. | No support of administration to make materials. | 3.7 |

From the above table, the 1st statement denotes that there is a lack of proper space to demonstrate instructional materials was not created the problem to the teachers, but there was no facility of the materials to demonstrate, which the problem was for the teacher. The mean weightage of this statement is 3.2. The mean weightage

of the order of 3.6 in the rating scale revealed that only three of the schools included in the sample had a separate mathematics classroom.

About the 3rd statement most of the teachers disagreed. The mean weightage of 4.0 also indicates that unavailability of graph board and bulletin board is a real problem.

About the 4th statement is unavailability of teaching machine and computer is 3.8. It means that there is a genuine problem in teaching mathematics is the absence of teaching machine such as calculators, computers etc.

The 5th statement is about the no support of administration to make materials majority of the teachers agreed that there is no support of administration to take materials. The mean weightage of 3.7 indicates that the teacher felt that occasions arose when mathematics can't be taught effectively and meaningfully because of the non- existence of a materials.

The questionnaire includes an open ended question towards the end in which teachers were requested express any other problem other than explained the statement. A list of the statement deemed as problem or otherwise, hindrances to the profession voted by more than 50 percent of the respondents are as following:

- Difficult to use teaching materials because of the large class.
- Provisions or opportunities should be provided where mathematics teachers could sit, contemplate are interact about the problems and recommend optional solutions and alternatives to the problems.

Most of the teachers who were found to be not using instructional materials even claimed that they were using materials. The reality was found by observing their classes. Some episodes of their observed class are as follows:

Episode One

“One day, the mathematics teacher entered into the classroom with daily using materials marker and duster. The entire student stood up and said good morning sir; he told good morning and sit-down. He wrote the topic “Basic terms on Probability” on the board then the teacher discussed with the students about general ideas and terms of probability. Then he taught by giving different examples like rolling a dice, tossing a coin and taking a card orally but he didn’t use concrete material even if there were such materials in school. He solved some problem and allowed students to do the remaining problems of textbook. Teachers helped the students on solving problem for some times. Then after a few minutes he wrote another problem and told to them solve it. Students were asking questions like how many red cards, face card etc. At that time bell rang and he said them to do remaining questions, gave homework and summarized the class”.

From the above observation class, it shows that the teacher was not using any instructional materials. He just wrote some formula and rule of probability without definition of probability. The teacher was teaching their class without any plan.

In this regard, teacher response as;

“We have only geometry box, graph boards a teaching materials for Mathematics class, some mathematical charts are available in the school for primary level. We are not using audio visual due to the time consuming.” (Teacher)

The above mathematics teacher’s view shows that, there are not any mathematical teaching materials and teaching aids. It shows that there is a lack of mathematical materials, lack of student pressure, and lack of student awareness to complete the whole course. Also there is a lack of references books and textbooks.

Teacher and student only depend on the guide books of mathematics and teachers note.

Episode Two

“One day, the mathematics teacher entered into the classroom with the daily using and other limited teaching materials which were related to the topics. Teacher left the teaching materials in fronts of the student desk and reviewed the previous lesson” he wrote the topic of that day “surface area of cube and cuboids”. He described about cube and cuboids with solid figures. He just wrote the formulas of surface area of both geometrical figures and students to solve the related problem by using given formulas. Students were asking about how the formulas can be developed but the teacher replied “formula is formula you have to recite.” Then he checked student copies and guided to their mistakes. Finally he summarized the topic and gave homework”

From this observation, it is found that trained/skilled teachers were not also implementing their skill in the real classroom appropriately. In the observed school, there were some paper made materials related to topic but the teacher did not use. If he used those materials then it would be easier to make students clear about surface area of cube and cuboids. The place of placing presentation and summarization skill of instructional materials gained in training session were not also found to be transferred in the real classrooms.

Supervision is an essential part of classroom teaching that also aware and gives feedback to the teachers for transfer in classroom teaching. Head teacher, resource person and school supervisor are especially responsible for supervising the class. All the teachers were found to have in favor of supervision of the classroom teaching, however their supervision was limited to know whether the teachers were in

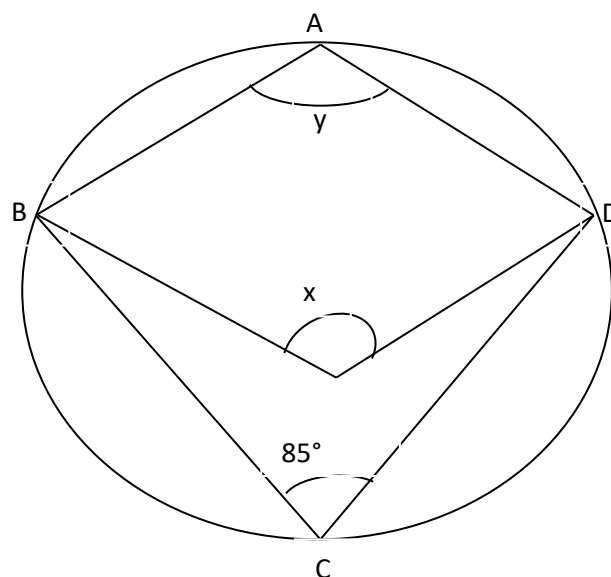
classroom or not and course would be completed in time or not. It was found that the school supervisions used to come in their schools for sometimes and talked with head teacher and teacher but they did not observe the classes regularly.

According to the teachers, they never receive fruitful feedbacks from the resource person and school supervisor. Moreover, they stated that, provided feedbacks they would try to make their teaching effective through the teacher training.

The causes becoming the above problems are teacher's carelessness, work load, large class size, lack of encouragement, lack of supervision. The main reason was seemed as teacher's carelessness. Most of the teachers were not consciousness and responsible about educational training. If there is a regular supervision, reward/punishment system and providing refreshing training for trained teachers then the transfer of teacher training would fruitful.

Episode Three

“One day mathematics teacher entered into the classroom with daily uses materials. Then he cleaned the white board and wrote the topic “circle” and focused on this exercise with making the figure given below:



Then after that he told the students to find the angles x and y with the help of theorem

which was already proved in previous class. Then students were busy to solving the problem given, the teacher just stood in front of class and observed only the students of first bench. When students stopped their pen to write the solution because of confusion, at that time teacher just gave some hints to all students in whiteboard. Only one student showed the solution to the teacher. And other students were discussed with friends about the solution of that question. Teacher again repeated the above hints on the whiteboard and connected with that theorem. Again teacher told the students to solve the next question by giving hints. At the end of this class teacher gave homework from textbook.”

The above observation shows that there is a lack of participatory approach of both students and teacher in classroom because teacher gives the solution himself without involvement of student. So, there is a lack of teaching/learning management also. Teacher ordered the student for looking answer, it means there is also lack of preparation and confidence of teacher. There is a lack of diagnostic test and oral test.

In this context the mathematics teacher told that, *“I am not using any fixed teaching methods for mathematics teaching but my aim is to how children receive the knowledge, in that way I go, I initialize circle by discussion method with students. Our teaching is child centered.”*

There is contradiction on teacher view and classroom observation. Teacher mostly uses lecture-cum practice method in mathematics teaching. Evaluate students by giving classwork and homework.

According to policy statements of the NBPTS accomplished teachers display a “readiness to work collaboratively”, participate in “Collaborative efforts to improve the effectiveness of the school” and “cultivate a critical spirit in appraising the

schooling.” In modern scenes teacher should use the child centered method, cooperative and more collaborative learning in the classroom teaching that makes more effectiveness of learning.

The CDT theory specifies that instruction is more effective to the extent that it contains all necessary primary and secondary forms. Thus, a complete lesson would consist of objectives followed by some combination of rules, examples, recall, practice, feedback, helps and mnemonics appropriate to the subject matter and learning task.

The above analysis shows that the problems on mathematics teaching learning are lack of teaching materials such as teacher guide, books and instructional materials, lack of learning management in classroom, lack of explanation of terms, not giving feedback and suggestion to improve in mathematics learning.

The cause of becoming above problems are not well participatory approach of both students and teacher in teaching in classroom, lack of preparation and confidence of teacher, lack of diagnostic test and oral test, lack of concrete materials, lack of friendly relation with teacher and student, lack of teaching/learning management, lack of appropriate teaching method but teacher mostly used lecture method.

Problem Related to Mathematical Content

Content is the most important element of the education program in our country or education curriculum in Nepal. Content are designed after the information of the objectives of the curriculum, contents are organized form of skill, attitudes and concept marked by the objectives, content are helpful for teacher and students to perform their skill in practical life.

Content's should be conducted according to the learner's desire, needs, age, level and capacity. Contents includes necessary knowledge skill process and values so

content is one of the necessary part of education program of Nepal and the education program may help to provide more intelligent and effective co-operation form of parents and community.

For the understanding of the problems in mathematical contents, the researcher raised four questions. The researcher tries to elaborate the following problems in detail related to mathematical content.

Table: 4.4 Weightage mean of teacher's response on problem related to mathematical content

| S.N. | Statements | Mean weightage |
|-------------|---|-----------------------|
| 1. | Some of the units are difficult to teach. | 3.2 |
| 2. | Relation between mathematics in school and mathematics in community is low. | 3.8 |
| 3. | Content recognized and use connections among them problem. | 4.0 |
| 4. | Frequent use of instructional materials to motivate students and make mathematics is a problem. | 3.0 |

From the above table, 1st statement denotes that, most of the teacher respondents agreed that some units are difficult to teach. Only a few teacher respondents disagreed and the mean weightage 3.6 indicates that is a significant problem for the most of the teacher expressed that they found difficulty to teach for some unit like home arithmetic, menstruation, probability, circle, compound interest, vectors and transformation as cited the following reasons for difficulty.

- Some questions there are length problem
- Some topic figures are inadequate
- Some questions are wrong and unclear

About the 2nd statement 75% of teacher agreed that the relation between mathematics in school and mathematics in community is necessary. The mean weightage response on this statement was 3.8. This shows that strong favor on problem. Community is the most important factor to develop mathematics education. Most of the teacher say's community doesn't show any interest and doesn't interact with mathematics subject teacher, school administration about the importance of mathematics, mathematical achievement, there children mathematical achievement and school administration doesn't give any information about mathematics and its importance.

About the 3rd statement content recognized and use connections among them is a problem is 4.0. This statement indicates that it is a significant problem. In field survey most of the teacher say's it is a necessary point if contents recognize and use connection among mathematical idea it is easy to teach mathematics subject and it helpful in self-study student in mathematics.

At last, about the 4th statement a few teachers' respondents agreed that they make frequent use of instructional materials but most of the responded teacher disagreed and the mean weightage is 3.0 indicate that there is a problem in the use of instructional materials. The researcher found the following reasons:

- 70% of respondents said, that the materials are not available and found required are not easy to get.
- 68% of respondents said, thatthey don't get encouragement and suggestions to make request use materials.
- 78% of the respondents said, that instruction by using materials consumes a lot of time and oral course couldn't be finished on time.

From the above view of teachers, it shows that there are many problems related to course content, inadequate figures, course not finish on time as well as insufficient class period.

Problem Related to Student Background Characteristics

It is generally agreed that students ability are dissimilar in learning mathematics due to various backgrounds such as age, intelligence, gender, maturity, socio-economics status. Poor motivation and failure to provide clear insights to the meaning and method of the object to the student in mathematics learning is the main problem for the teachers. Problems related to student's background characteristics have been categorized into four different items to identify the response of teachers. For the convenience of analysis towards the response, mean weightage for each item had been calculated. About the statement, teaching learning management due to variables of age, individual difference, and intelligence of students indicates problem. The four questions and their mean weightage are tabulated as below:

Table: 4.5 Weightage mean of teacher's response on problem related to student's background characteristics

| S.N. | Statements | Mean weightage |
|-------------|--|-----------------------|
| 21. | There is difficulty in teaching learning management due to variables of age, individual difference and intelligence of students. | 3.6 |
| 2. | Difficulties on teaching mathematics because of difference in social, cultural and family environment of students. | 3.4 |
| 3. | Difficulty to involve both male and female students equally in teaching learning. | 2.4 |
| 4. | Teachers face problem in teaching due to poor background at primary and lower secondary level. | 3.7 |

On regards of the 1st statement there is difficulty in teaching learning management due to variables of age, individual difference and intelligence of students indicates problem. Most of the teachers are agreed with this statement. Mean weightage value of the statement is 3.6, which indicates the problem for majority teachers. Variation in socio-cultural and family environment of students has been a problem for teachers. Mean weightage value 3.4 shows the favorable on the problem. During the research majority of teachers have claimed about the student's poor background in mathematical concept at primary and lower secondary level. Mean weightage response on this statement 3.7 shows the strong favor of teachers toward the problems. However, very few cases have been found as problem on participating students of different sex, social and ethnic groups. Mean weightage of the statement involvement of both male and female students equally in teaching learning is 2.4. This indicates that there is less significance over problem.

In the classroom, each student's is different because of their social, economic, family backgrounds. Some students are very poor in the basic mathematical concept so it creates a big problem while teaching mathematics in the classroom. (Teacher)

Chapter-V

Summary, Findings, Conclusion and Recommendations

Summary of the Study

The purpose of the study was to identify the levels and extents of problems faced by mathematics teachers. The main objective of this study was to identify the problems faced by secondary school mathematics teachers.

The specific objectives of this study were to identify the problems faced by teachers due to school administration, teaching method and materials, classroom management, mathematical content and student background characteristics and to suggest some measures for the solution of the problems. For the convenience of this study, the problems were categorized into different five areas, school administration, teaching method and materials, classroom management, mathematical content and student's background characteristics.

This study was descriptive and authenticated by qualitative data. The researcher himself developed the questionnaire under the guidance of supervisor. The questionnaire, interview guideline and classroom observation form were the main tool of the study. Open questionnaire were included in each category of problems, and descriptive analysis of collected responses were carried out. Mean weightage was used for the analysis of the problems.

Findings of the Study

From the field survey and statistical analysis of the collected data, it was found that teachers have been facing numerous problems during the course of teaching mathematics at secondary level. On the basis of analysis and interpretation of result, major findings of the study were as follows.

- There is a lack of classroom management for mathematics teaching due to large number of students, books are not available in time, student's are utilized by political parties, difficulties to the teachers in the sense of result oriented system and physical and economics crisis of school.
- There are no sufficient mathematical teaching materials and teaching aids and teachers were not using available instructional materials, there is a lack of protection for available materials for future uses. Also there is a lack of participatory approach of both students and teacher in the classroom, there is a lack of preparation and confidence of teacher's lack of appropriate teaching method but teacher mostly used lecture method.
- From the study, it was found that school administration is irresponsible to manage and construct necessary teaching materials. There is a lack of facilities and reward for the good performance of the teacher and school doesn't manage refresher training to teach difficult and rigor topic and also the teacher's guide and curriculum are not available in time.
- From the study there were some problems in mathematical contents. It was found that difficulty to teach for some units like home arithmetic, mensuration, probability, circle, compound interest, vectors and transformation. In some topic like home arithmetic, mensuration and vectors had length problems. In circle,, transformation and probability had figures are inadequate. In probability, compound interest and menstruation had some question are wrong and unclear. In the study there is a lack of relation connection between mathematics in school and mathematics in community. Community does not show any interest on the important of mathematics, result of mathematics in school and mathematical achievement of their children.

There is a lack of interaction between community and school administration, mathematics subject teacher. Content doesn't properly recognize and use connections in mathematical ideas are also the problem on content in mathematics while teaching.

- Because of the poor background of students at primary and lower secondary level on mathematics there is a problem on teaching mathematics. Classes are much crowded so teacher couldn't teach mathematics well. Individual differences, variables of age and intelligence of students are also affecting the achievement of students. Also, students are from different social, cultural, economic and family background so these are also affecting to teach to the teacher.

Besides the problems mentioned above, the following are the other problems related to; lack of moral education, lack of parents teacher association, lack of administrative support for the development of mathematical materials, not well participatory approach of both students and teachers in teaching in classroom, lack of friendly relation with teachers and students, lack of appropriate teaching methods, lack of supervision, lack of opportunity to join in the mathematical conferences, seminar and other any program of mathematics, lack of awareness of the teacher and students, lack of political support for the education sector, lack of parents responsible towards his/her child, lack of uses of appropriate teaching materials, lack of practical knowledge, lack of school curriculum changes in new concept of mathematics in timely etc.

Conclusion of the Study

For the above stated findings of the study, it can be concluded that mathematics teaching and learning is not satisfactory in Lamjung district. Among the

five different categories described above it is found that there are numerous problems faced by teachers due to classroom management, teaching method and materials, school administration, mathematical content and student background characteristics.

It was found that the secondary level teachers have been facing more, or less similar problems. Teachers are facing many problems due to lack of training, crowded number of students. Lack of math lab facility, lack of teaching materials, poor evaluation process, time factor, urban oriented curriculum are the burning problems of the teachers in teaching mathematics at secondary level. Similarly lack of parents teacher association, lack of pre-planned and confidence of the teacher, lack of supervision, lack of opportunity to join in the mathematical conferences, seminar and other any program of mathematics.

Recommendation for Educational Implication

More research is needed to the secondary level teacher problem of teaching Mathematics. However, this research spelled out the current situation of the secondary level teacher's teaching problem by using problem solving method at classroom.

Based on the finding and the conclusion from this study, the following recommendations were developed.

- Administration should create the meaningful mathematical environment in the classroom.
- Teachers should not be entered in the mathematics classroom without any plan and confidence.
- Supervision and guidance program should be provided to upgrade the teachers.
- Use of lesson plan should be encouraged.

- A district level orientation program should be conducted for mathematics teacher to make them familiar with the new curriculum and its other aspects.
- Training and seminar should be conducted for the mathematics teacher.
- Government should timely re-change mathematics curriculum for the new concept of mathematics.
- Mathematics curriculum designer solve the problem of mathematics content's like some topic length problem, figures and problem and some exercise question are wrong and unclear question's problems.
- Evaluation system should be more precise and scientific.
- Classwork and home assignments should be checked properly.
- School should provide the information about the achievement of students to their parents and should create the environment for coordination with teachers, parents and students.

Recommendation for Further Study

The researcher makes the following recommendations for the further study.

- Similar study should be carried out with large sample and various schools of different parts of Nepal.
- Same study related to the problems faced by students for the achievement of mathematics learning should be conducted.
- The problems related to mathematics curriculum, textbook and its relevancy to the context of multicultural classroom should be one of the areas of the further study.
- One the basis of class wise and other level wise, similar study should be conducted.
- The problems related to rural areas with urban area's mathematics teachers should be compared.

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Appendix-A

Questionnaire form for the teacher

Respected teachers,

I am a master's degree student of Mathematics Education, central Department of Education, Kirtipur, Kathmandu. I am a writing thesis entitled on "*Problem faced by Mathematics Teacher in Teaching Mathematics at Secondary level*" as the partial fulfillment of my degree graduation. Teaching learning activities couldn't be effective without identifying the actual problem of the teachers in teaching, so to complete this thesis, I have prepared some questionnaires, which are prepared for you. Researcher is very much thankful for your valuable help and would like to express gratitude to you and your institution. The information obtained from you will be used this study and your answer will keep secret.

Researcher

Prakash Ghimire

Department of Mathematics Education, Kirtipur

Kathmandu

I requested to fill this questionnaire as follows:

- Please read carefully and respond as you fell.
- For open questionnaire, please write your opinion.
- You are requested not to leave blank for any question.

Section-A
Teacher's Bio Data Form

Name:

Sex: Male: Female:

Name of School:

Academic Qualification:

Length of teaching experience:

Status of training: Trained: Untrained:

Section-B

Please give tick marks which you fell the best option where, S.A. = Strongly Agree, A= Agree, U= Undecided, D= Disagree, S.D. = Strongly Disagree.

Problem Related to School Administration

| S.N. | Statements | S.A. | A. | U. | D. | S.D. |
|------|--|------|----|----|----|------|
| 1. | Compulsion to take more classes because of low number of mathematics teacher. | | | | | |
| 2. | Irresponsible administration to manage and construct necessary teaching materials. | | | | | |
| 3. | Lack of refresher training to teach difficult and rigor topic. | | | | | |
| 4. | Lack of facilities and reward for the good performance. | | | | | |
| 5. | Library facility is available. | | | | | |

Problem Related to Teaching and Materials

| S.N. | Statements | S.A. | A. | U. | D. | S.D. |
|------|--|------|----|----|----|------|
| 1. | Lack of proper space to demonstrate instructional materials. | | | | | |
| 2. | No separate room for mathematics instruction as math lab. | | | | | |
| 3. | The room is equipped with a graph board and bulletin board. | | | | | |

| | | | | | | |
|----|---|--|--|--|--|--|
| 4. | Un availability of teaching machine and computer. | | | | | |
| 5. | No support of administration to make materials. | | | | | |

Problem Related to Classroom Management

| S.N. | Statements | S.A. | A. | U. | D. | S.D. |
|-------------|---|-------------|-----------|-----------|-----------|-------------|
| 1. | Un availability of mathematics lab. | | | | | |
| 2. | In adequate of physical facility. | | | | | |
| 3. | Difficulties in completion of course taught using teaching materials on time. | | | | | |
| 4. | Large number of students in a single class. | | | | | |
| 5. | Boredom felling in mathematics class by students. | | | | | |

Problem Related to Mathematical Content

| S.N. | Statements | S.A. | A. | U. | D. | S.D. |
|-------------|---|-------------|-----------|-----------|-----------|-------------|
| 1. | Some of the units are difficult to teach. | | | | | |
| 2. | Relation between mathematics in school and mathematics in community is low. | | | | | |
| 3. | Content recognized and use connections among them problem. | | | | | |
| 4. | Frequent use of instructional materials to motivate students and make mathematics is a problem. | | | | | |

Problem Related to Students Background Characteristics

| S.N. | Statements | S.A. | A. | U. | D. | S.D. |
|------|---|------|----|----|----|------|
| 1. | Difficulty in teaching learning management due to variables of age, individual difference and intelligence of students. | | | | | |
| 2. | Difficulties on teaching mathematics because of difference in social, cultural and family environment of students. | | | | | |
| 3. | Difficulty to involve both male and female students equally in teaching learning. | | | | | |
| 4. | Problem in teaching due to poor background at primary and lower secondary level on mathematics. | | | | | |

Appendix-B

Class Observation Form

Name of the teacher:

Gender: a) Male: b) Female:

Grade: Period: Subject: Title:

.....

School:

.....

...

Date: Time:

.....

| 1. Initiation of the lesson | | Yes | No | Remarks |
|-----------------------------|--|-----|----|---------|
| | a) Was the lesson objective clear to students? | | | |
| | b) Was the lesson based on the previous one? | | | |
| | c) Were the students ready to learn? | | | |
| | d) Was the start of the lesson interesting? | | | |

| 2. Appearance in the classroom | | Good | Tolerable | Poor | Remarks |
|--------------------------------|-------------------|------|-----------|------|---------|
| | a) Clean | | | | |
| | b) Self-Confident | | | | |
| | c) Punctual | | | | |
| | d) Pleasing | | | | |

| 3. Development of the lesson | | Yes | No | Remarks |
|------------------------------|--|-----|----|---------|
| | I. Subject matter and sequence | | | |
| | a) The Relevant to curriculum | | | |
| | b) Relevant to the text book | | | |
| | c) Relevant to the students level and interest | | | |
| | d) Teachers command over subject matter | | | |

| II. Language | Good | Tolerable | Poor | Remarks |
|--------------|------|-----------|------|---------|
| a) Fluency | | | | |
| b) Voice | | | | |
| c) Structure | | | | |
| d) Clarity | | | | |

| III. Instructional materials | Good | Tolerable | Poor | Remarks |
|----------------------------------|------|-----------|------|---------|
| a) Size and clarity | | | | |
| b) Appropriateness to the lesson | | | | |
| c) Pleasing | | | | |

| IV. Students participation | Frequently | Sometimes | Seldom | Remarks |
|------------------------------|------------|-----------|--------|---------|
| a) Listen attentively | | | | |
| b) Ask question relatively | | | | |
| c) Answer teachers question | | | | |
| d) Participate in discussion | | | | |
| e) Follow directions | | | | |
| f) Experiment | | | | |
| g) Any other activity | | | | |

| V. Teacher's activities | Frequently | Sometimes | seldom | Remarks |
|--------------------------------|------------|-----------|--------|---------|
| a) Lecture | | | | |
| b) Question | | | | |
| c) Answer the students | | | | |
| d) Encourage students | | | | |
| e) Discourage students | | | | |
| f) Discuss with the students | | | | |
| g) Listen to students opinions | | | | |

| 4. Closing the lesson | | Yes | No | Remarks |
|-----------------------|---|-----|----|---------|
| | a) Was the lesson summarized? | | | |
| | b) Were the objectives achieved? | | | |
| | c) Was the lesson evaluated? | | | |
| | d) If yes, was it oral? | | | |
| | e) Was it written? | | | |
| | f) Was evaluation outcome satisfactory? | | | |
| | g) Was assignment given? | | | |

Observer's Name: Date:

Appendix-C

Interview Guideline for Mathematics Teacher

Name: Qualification:
Age: Sex:
Teaching experience: Training:
School's name:
Location: Rural/Urban:

The Interview with mathematics teacher will take on the basis of following main topics:

- Classroom management: Numbers of student's, Physical facilities, school environment space, blackboard etc.
- Mathematical instruction, Methods and materials, encouragement of students, lesson plan etc.
- Teacher's training and it's transfer in classroom teaching.
- Teacher's and student's characteristics.
- School administration.
- Opportunity of seminar, conference and training for mathematics teacher.
- Other special technique, strategies, activities of teacher while teaching mathematics.