

**PROBLEM FACED BY TEACHER IN TEACHING MATHEMATICS AT
SECONDARY LEVEL**

**A
THESIS**

**BY
SANJEET SAH**

**IN THE PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF EDCUATION**

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Letter of Certificate

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Thesis

By

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Entitled

Problem Faced by Teachers in Teaching Mathematics at Secondary Level

has been approved in partial fulfillment of the requirements for the
Degree of Master of Education.

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.....
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Abstract

The purpose of this study was to identify and analyze the problems faced by teachers in teaching mathematics at secondary level in Lalitpur district and also to find causes of arising such problems. The mixed method research design was adopted to conduct this study. Thirty schools of Lalitpur district were selected for sample by stratified random sampling method. Among thirty schools, thirteen schools were selected from rural area and seventeen schools were selected from urban area. Questionnaire, interview schedule and class observation form were used as tools to collect necessary data. To gather information, questionnaire was applied in all thirty schools where as interview schedule and class observation form were applied in five schools from those thirty schools. The researcher used mean as a statistical tool for analysis and interpretation of data collected from questionnaire. The result further authenticated by qualitative data obtained from interview and class observation. The researcher categorized whole data into problems related to teaching materials, problems related to teaching method, problems related to school administration, problems related to trainer, problems related to training and its transfer in classroom. After analysis of the data, the researcher found that teachers were facing problems due to construction, selection and use of teaching materials, due to lack of ICT lab and internet, due to trainer and due to lack of regular supervision from related agency. From this study, it can be concluded that teaching learning activities of mathematics in Lalitpur are not satisfactory because teachers are facing a number of problems due to construction and purchase of teaching materials, due to selection and use of teaching materials, due to teachers' training and its transfer in classroom and finally due to weak school administration.

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Acronyms

CDT	:	Component Display Theory
DEO	:	District Education Office
NMPTS	:	National Board for Professional Teaching Standards

Chapter I

INTRODUCTION

Background of the Study

It is believed that the development of mathematics and the development of human civilization were occurred together. It was created to fulfill human needs and later it was introduced into formal education system. Now a days people from business sector to farmer are using it. Therefore mathematics has become a part of human life.

Mathematics is the study of quantity, structure and change (i.e. arithmetic, algebra, geometry and analysis). The word mathematics come from the Greek word *μαθημα* (mathma) which means learning, study and science. Mathematics begins from many different breed of problems. Now a days, all sciences recommend problems studied by mathematicians and many problems arise within mathematics itself. Mathematics is used all over the world as an essential tool in many fields including natural sciences, medicine, engineering and social sciences. Applied mathematics, the branch of mathematics, is concerned with the application of mathematical knowledge to the other fields. It enthuses of new mathematical discoveries and sometimes leads to the growth of exclusively new mathematical disciplines like statistics and game theory. Maths has an important role in the development of science and technology. Mathematics is essential for understanding every discipline. Without knowledge of mathematics, it is very difficult for better understanding in the other disciplines like economics, physics, chemistry and so on. Accepting the need and implication of mathematics in human lives, Roger Bacon says:

“Mathematics is the gate and key to all sciences. Neglect of mathematics works injury to all knowledge, since he who is ignorant of it cannot know the other sciences or things of the world and what is worse men who are thus ignorance and so do not seek a remedy” (Eves, 1983)

Mathematics teaching refers to the sequential process of teaching and learning of mathematical information and knowledge. In this process, mathematical concepts are delivered from more known person to less known person, from teacher to students, from

educators to learners by using appropriate teaching methods and materials. Mathematics teaching is such a process in which learning of mathematical knowledge occurs when students (learners) process new mathematical information or knowledge in such a way that it makes sense to them in their own frame of reference that is in their own inner words of memory experience and response. Mathematics teaching assumes that mathematical mind naturally seeks meaning in context and it does so by searching for relationships that make sense and appear useful.

The term "mathematics" has been interpreted and explained in various ways. According to oxford advanced learners dictionary, mathematics is the science of number and space: branches of mathematics include Arithmetic, Algebra, Geometry and Trigonometry. Mathematics is the study of measurement, properties and relationship of the quantities and sets, using numbers and symbols." Mathematics is the deductive study of numbers, geometry and various abstract structures. Mathematics is very broadly divided into foundations, algebra, analysis, geometry and applied mathematics, which includes theoretical computer science (Encyclopedia, Columbia University Press). "Mathematics is the group of science (including arithmetic, Algebra, Geometry, calculus etc) dealing with quantities, magnitudes, forms and symbols" (Webster's Dictionary).

- Mathematics is the science which draws necessary conclusion (Pierce).
- Mathematics is the gate and key to all sciences. (R. Bacon).
- Mathematics is the free invention of the human intellect" (Einstein)
- Mathematics is a way to settle in the mind a habit of reasoning (Locke).
- Mathematics is nothing more than a game played according to certain rules with meaningless marks on paper (Hilbert).
- Mathematics may be defined as the subject in which we never know what we are talking about and what we are saying is true (Russel).

Mathematics is such a subject which has to be taught by doing rather than by reading and reciting, otherwise it creates problem in teaching and learning of

mathematics. The doing of mathematics gives rise to the need of a suitable method and materials to be used. Laboratory method and maths lab are proper answer to it.

In this context, about "maths lab" Servais and Varga (1979) stated "Abstract subjects can be taught desks, benches, blackboard and containing no other teaching aid. But live mathematics teaching flourished best in such a classroom which is specially designed to encourage the use of available teaching materials. obviously, everything depends on the resources at the school disposal. It is possible to give a new look of teaching, even in unfavourable condition, if the teacher possesses the necessary conviction and ingenuity. Conversely, the best equipment is useless unless it is properly used. In planning school today, thought should be given to organizing laboratories for mathematics in the same way as they are organized for physics and other natural sciences.

About the modern mathematics classroom, Bhatia and Bhatia said that the teacher tools have long consisted of chalk, blackboard, pencil and textbook. However, today it uses demonstration models of various shape and sizes, drawing instruments, graph stencils, measuring instruments and many pictures pamphlets, books and mathematical magazines. Films slides, overhead projectors, main pulative are being used in teaching mathematics in the modern classroom." But the learning system in the context of Nepalese school is totally based on text books. Since the text books have been written in formal Nepali language, it is more difficult for those students who have other language speaking background than Nepali. On the other hand, teachers use textbooks as an ultimate means of teaching that does not provide the opportunity of learning with local context, because of financial problem. Nepalese community based schools could not provide an afford money to spend in materials and equipments. Classrooms are not well equipped physically with teaching materials maths lab, computer and collection of low cost and cost free materials that are essential for teaching and learning activities and not organized properly by concerned agencies.

Mathematics is an organized series of relations among mathematical concepts and teaching mathematics is the learning process of new mathematical knowledge on the basis of pre-requisite and pre-experience of learners under the guidance of teachers.

Problems of instruction in mathematics refers to those challenges which causes difficulties in learning of mathematics. There are many problems of instruction in mathematics. Such problems may be related to classroom management, administration students and teaches as well. The fundamental problem of instruction in mathematics is how to get mastery in any lesson of mathematics by the learners. The major problems of instruction in mathematics are as follows:

Teaching for Understanding

The first challenge of teaching mathematics in school is how to provide the preliminary knowledge of new concept, relation, and skill of mathematics and how to make the students familiar with abstract concepts, relations and symbols.

Teaching for Assimilation

Another problem of teaching mathematics is how to internalize and utilize the learned mathematical knowledge, not to get mastery in attained mathematical knowledge is the problem for assimilation.

Teaching for Transfer

The prominent problem of teaching mathematics is to find out the definite pattern of mathematics to use it in new context. When a student can't apply learned mathematical knowledge in one context into another context, then it is a problem of teaching for transfer.

Teaching for Permanence

The difficulty of keeping permanence in learned mathematical knowledge, skill and concepts after getting mastery in it by the learners is the another notable problem of teaching mathematics. Teaching itself becomes meaningless if permanency is not maintained and this is the problem of teaching for permanence.

Rationale of the Study

From basic education onwards, emphasis on mathematics learning up to secondary level is given in Nepalese education scenario and it is compulsory subject there in elementary and secondary level. We therefore in need of good teachers of mathematics to instruct in elementary and secondary level. Good students of mathematics could be good teachers in the future. However, in the last few years it has been observed that enrolment of mathematics in the secondary level has been diminishing rapidly and the success rates also found to be gone under the expected rate. It could therefore be suspected that there are certainly some problems in the teaching and learning of mathematics in the secondary level which have created the above discussed unfavourable condition. I am also a mathematics teacher at secondary level and facing many problems. It is therefore felt necessary to study the teaching learning problems related to mathematics education in the secondary level so as to get a better picture of the situation and to identify means and ways to improve the teaching learning process.

Lalitpur is one of the developed districts in Nepal. It is situated in the central part of Nepal and attached with Kathmandu, the capital city of Nepal. Some part of Lalitpur lies within Kathmandu valley and this part is well developed where as other part is far from the valley which is undeveloped regarding road, transportation, education, health services and many more facilities. That is why Lalitpur is known as "Bati muniko andhyaro" in Nepal.

The objectives of the study are as follows:

1. To identify major problems faced by teachers in teaching mathematics at secondary level.
2. To analyze major problems faced by teachers in teaching mathematics at secondary level.

Statement of the Problem

Since secondary level is the base of higher education, it will be appropriate to discuss the problem faced by mathematics teachers at secondary level. The study tries to

explore and analyze the problems faced by secondary mathematics teachers of Lalitpur district. Specially, the study intends to answer the following questions.

- What are the problems faced by mathematics teachers in teaching at the secondary level of Lalitpur district?
- What are the causes of arising such problems in teaching mathematics?

Significance of the Study

Mathematics is an essential part of school curriculum. So it is included as compulsory subject at all level of school education. Also mathematics is included as optional subject at secondary level. The mathematics teachers are facing many problems in teaching. Problem may arise because of confusion about subject matter and about optimal procedures to present them to the students. Problems also arise because of the lack of knowledge about the classroom management. The study will be contributed a lot in identifying problems once they know what they are. Thus the study is significant for the reason that it will help to provide information to the concerned agencies to reform and improve the mathematics teaching at the secondary level. Also it will help to improve mathematics teaching especially for untrained teacher similarly the result of this study will provide some materials for the improvement of professional position of teachers by removing the problems related to their profession. The significance of this study is presented in the following ways:

- This study helped to identify the problem faced by secondary level mathematics teachers in teaching mathematics.
- This study helped to give suggestions for the improvement in solution of the problems.

Delimitation of the Study

The limitations of the study were as follow:

- i. The study was limited to the government school only.
- ii. The study was limited to Lalitpur district.

- iii. The study was concerned only with classroom teaching problems in grade nine and ten.
- iv. This study was limited to compulsory mathematics only.
- v. This study was limited to secondary level only.

Operational Definition of Key Terms

The meaning and definition of terminologies used in this study differ from discipline to discipline and from person to person. But, the terminologies are defined here from researcher's perspective. Such terminologies are defined as follows:

Teacher: The person who teaches mathematics at secondary level in lalitpur district.

Problem: It is a situation that is unsatisfactory and difficult for teacher in teaching.

Chapter II

REVIEW OF RELATED LITERATURE

Thematic Review/Empirical Review

Number of books, research reports and papers and other booklets can be found that concern with curriculum instructional materials method and so on. Especially few of them, has been done in the related field. Review of some related literature is cited below:

Pathak (1986) conducted a thesis entitled “The problems faced by the teacher in Kathmandu district in the implementation of mathematics curriculum for lower secondary school.” He concluded that the most of teachers of Kathmandu district have been facing problems in the selection and use of instructional materials but they are facing problems in selecting proper evaluation devices.

Pandit (1999) mentioned on an article 'problem faced by mathematics teacher education in the implementation of three year 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 lecture's involvement in curriculum planning lack of efficiency to conduct teaching facilities and aids, students weak background in subject matter, lack of opportunity given to upgrade their knowledge and a huge number of personal problems of lectures.

About the problems in teaching mathematics, Pandit (1999) writes in this one article that teachers may face various problems which teaching mathematics. Such problems can be divided in to two parts:

- (i) Problems in mathematics education and
- (ii) Problems faced by them while teaching mathematics in real classroom situation and some remedial suggestions has also been given in his article.

Sharma (2000) did a research work on “A study on the availability and use of instructional materials in teaching mathematics at the primary school of Parbat district of Nepal.” He concluded that the availability of the materials was not found very

encouraging in the most of the school expect the case of some materials such as meter scale, compass, clock model and abacus etc.

Basnet (2003) conducted his thesis entitled teaching problems faced by the mathematics teachers in existing curriculum of grade eight. He concluded that mathematics teaching and learning is not satisfactory at grade eight in Jhapa district. The teachers and students are facing many problems due to the lack of training, orientation opportunity for mathematics teachers. In existing curriculum, inadequacy of text book, lack of teachers' guide and reference books, lack of instructional materials, lack of physical facilities in the classroom, large class size, defective evaluation system and so on.

According to Dale, a teacher with a sound and instancing of good teaching techniques, recognizes and uses good teaching procedures and appropriate teaching materials which are helpful and useful in transfer of learning. He realizes that audio-visual materials are usually means and not ends.

Thapa (2005) conducted a thesis entitled "A study on the problem faced by teacher in teaching mathematics at primary level". She concluded that the teachers are facing many problems due to large class size, irrelevancy of teachers' guide, lack of instructional materials, lack of supervisory help and so on. In mathematics teaching, teaching techniques are such aids which are helpful in making lesson interesting, to explain the content and to remember it by heart during teaching techniques. Instructional strategies refers to pattern outcomes and to guard against others. There are several methods of teaching and some of them emphasize in the supreme source for teacher. Among them inductive method, discovery method, field trip method, discussion method, project method always emphasize on the active participation of the students.

Prem Kumari Thapa (2005) conducted her study on "Problem Faced by Teacher in Teaching mathematics at Primary Level." She concluded that there are many significant professional problems facing by mathematics teachers in Kaski district. She also found that there is significant difference between the problems of rural teachers and urban teachers.

Bhattarai (2005) conducted a study on the topic entitled "A study on problem faced by the mathematics students in existing curriculum" and concluded that mathematics learning in secondary level is disturbed by so many factors like lack of sufficient instructional materials, lack of physical facilities, teachers' negligence towards curriculum planning, students' weak background in subject matter etc. Most of the problems were created due to financial situation and lack of proper academic management.

Baral (2008) in the study, "Problem faced by Mathematics teacher in teaching mathematics" indicated that there were number of problems relate to curriculum designing, textbook writing, teaching method, classroom situation, students background, teaching materials, teachers training and so on.

Objha (2011) conducted a thesis entitled "A study on the problem faced by mathematics teachers in teaching mathematics at secondary level". He concluded that most the problems arise because of large class size, irrelevancy of teachers guide book in the sense of teachers' needs, lack of instructional materials, adequacy of teacher training, lack of supervisory help, lack of physical facility etc.

Khanal (2012) conducted a thesis entitled "A study on the problem faced by teacher in teaching mathematics at higher secondary level" and concluded that few numbers of students participation in the mathematics classroom, lack of moral education, lack of parents teacher association, lack of administrative support for the development of mathematical materials. Students are utilized in political program, difficulties to the teachers in the sense of result oriented system not well participatory approach of both students and teachers in teaching in classroom, lack of friendly relations with teacher and students, lack of preplan and confidence of teacher, lack of appropriate teaching methods, lack of diagnostic test and oral test, lack of supervision, lack of opportunity to join mathematical conferences, seminar, lack of political support for educational sector, lack of parent's responsibilities problems faced by teacher in teaching mathematics at higher secondary level.

Poudel (2015) conducted a thesis entitled "Problem faced by mathematics teacher at higher secondary level" and concluded that most of the teachers showed lack of moral education, economic crisis of administration, lack of supervision, lack of proper teaching environment, lack of student's awareness towards mathematics class, lack of appropriate teaching plans and materials, lack of students' participation, poor educational background of students. Trained and skilful teachers were not implementing their knowledge. There was lack of mathematical program like seminar, conference etc.

From the above review of related literature, the scenario regarding problems faced is summarized in the following table.

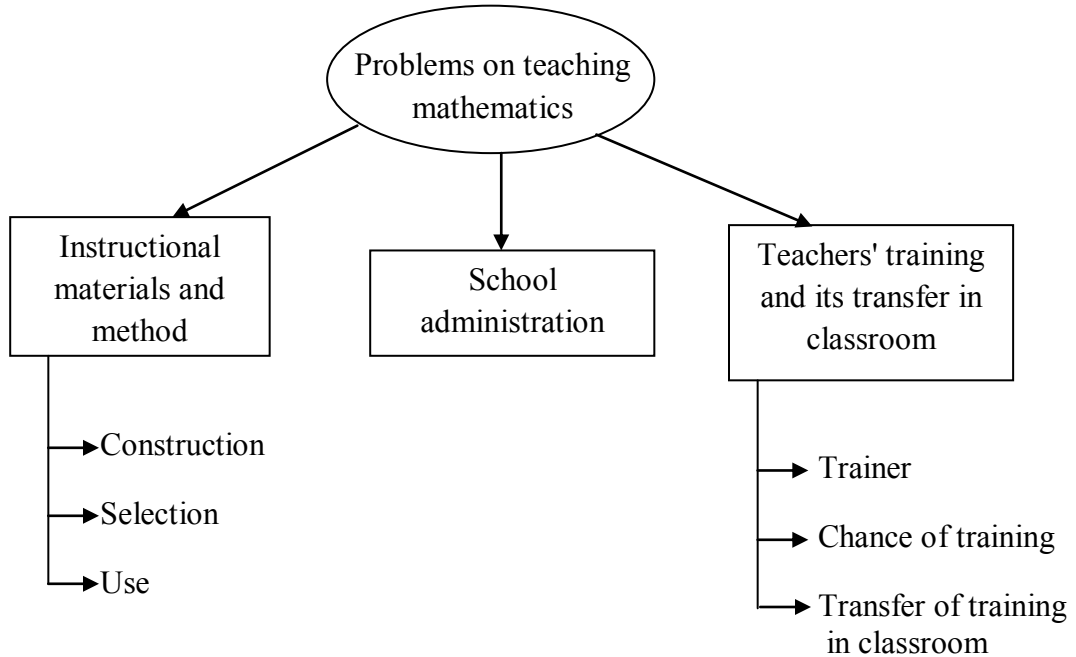
Table 2.1: Scenario Regarding Faced Problems

S.N.	Researcher's Name	Problem Area	Year
1.	B.R. Pathak	Selection and use of instructional material	1986
2.	R.P. Pandit	Involvement of lecturer in curriculum planning	1999
3.	K.D. Sharma	Availability of teaching materials	2000
4.	D. Basnet	Training	2003
5.	B.K. Thapa	Size of class	2005
6.	M. Bhattarai	Instructional materials, physical facilities	2005
7.	S.K. Baral	Curriculum designing	2008
8.	B.B. Ojha	Large class size, training, materials	2011
9.	S. Khanal	Administration	2012
10.	M. Poudel	Supervision, administration, proper teaching environment	2015

From above table, it can be seen that this study is different from others in sense that teachers are facing problems regarding construction of teaching materials, availability of ICT lab and internet, and trainer.

Conceptual Framework

On the basis of theoretical review reviewed in second chapter of this study, the relation between methodological process and variables/ research problems is shown in the following mental figure of researcher to get expected output:



For the answer of the question "What are problems?", survey was conducted and for the answer of the question "why are problems?", interview and class observation were conducted.

Chapter III

METHODS AND PROCEDURES

This chapter describes in detail the procedures involved in sampling, instrument construction, design of the study, data collection, scoring procedure and the statistical techniques used.

Population and Sample

The population of the study were mathematics teachers at the secondary level at Lalitpur district. According to Lalit Shakshik Sankalpa 2072/073, published by DEO Lalitpur, there are 67 secondary schools in Lalitpur district.

Thirty schools from sixty seven school in Lalitpur district were selected for sample by simple random sampling method. From those thirty schools, mathematics teacher who teaches compulsory mathematics at class 9 or 10 were selected as sample of the study. From those thirty teachers, five teachers were selected for interview and five teachers were selected for class observation.

Method of the Study

This study had included both quantitative and qualitative method, called mixed method. Johnson and Onwnegbuize (2004; p. 17) defined "mixed method of research is formally defined as the class of research where research combines both quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study." Therefore this is a mixed research which is a survey authenticated by qualitative data.

Sources of Data

Both primary and secondary data were used in this study. Secondary data were used for the understanding of past research study related to this study that were mentioned in the literature review. But the primary data were the main sources of the analytical section of this study which were carried out through different tools and techniques.

Tools and Instruments of Data Collection

The following tools and instruments were constructed on the basis of need and characteristics of the sample chosen and were used for data collection:

- (i) Questionnaire
- (ii) Interview schedule
- (iii) Class observation form

The questionnaire were developed by the researcher himself with the help of supervisor. It included twenty nine items based on conceptual frame and related to various problems which are being faced by secondary school mathematics teachers in Lalitpur district.

The area of problems were related to construction of teaching materials, selection of teaching materials, use of teaching materials, trainer, opportunity for training, transfer of training in classroom and school administration. At the end of each section of questionnaire, the respondents were requested to comment on the areas that were not covered in the questionnaire.

The interview schedule was used for the qualitative information. Five teachers were selected and then interviewed for this purpose. The open ended questions were asked to them with the help of interview guidelines that were developed by the researcher himself with the help of the supervisor. Interview guidelines were constructed in such a manner that they could find the problems with its causes faced by mathematics teachers while teaching mathematics at secondary level.

The classroom observation form was also used for qualitative information. The researcher used the classroom observation form which was prepared by Tribhuvan University to observe the classroom practice in mathematics teaching. Five teachers and their classes were selected for this purpose.

Reliability and Validity of Tools

Reliability of tools refers to consistency of tools and validity of tools refers to appropriateness of tools. Reliability is necessary but not sufficient condition for validity. Reliability and validity of an instrument means reliability and validity of the interpretation and use to be made of the results obtained by using that instrument.

The reliability and validity of tools/ instruments constructed for this study were ensured by applying established tools in local context.

Scoring Procedure

For scoring the statement, weightage of 5,4,3,2,1 were assigned to the statement SA, A, U, DA, SDA respectively for positive statement and 1, 2,3,4,5 were assigned to the statements SA, A,U, DA,SDA respectively for negative statements. Mean weight age was calculated. Total score of five point likert scale is 15 and hence average weightage is 3. Therefore if the average weightage of a statement is less than 3 then the statement is considered as problem area otherwise not.

Data Collection Procedure

The researcher went to sample school on foot (some of by vehicle) and visited each sample school along with questionnaire, observation form, interview schedule and request letter given by Department of Mathematics Education, T.U. Kirtipur. After this, researcher explained the purpose of the visit. Then the researcher, requested the teacher of the school included in the sample to fill questionnaire honestly. Some of the teachers filled questionnaire and returned in an hour of that day and some returned in two, three, four or five days later. The interview schedule asked to the selected sample teacher by using open-ended questions. The researcher also observed the class of selected teachers.

Data Analysis Procedure

After collecting data, the researcher analyzed and interpreted using both quantitative and qualitative method. The researcher used five point likert scale as a statistical tool for the analysis of questionnaires. Mean weightage was used to find

whether a statement is problematic or not and qualitative theme and their interpretation were done on the basis of quantitative result.

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

Mean weightage is used to locate the central position of the responses to the statements of respondents as a whole in the rating scale of teachers as a whole in the rating scale. The average mean weightage was calculated as follows:

$$\text{Mean weightage} = \frac{\text{Total rank score of a statement}}{\text{No.of teacher's responses}}$$

If the calculated mean weightage is equal to or greater than three then it concludes that the statement is problematic and it is strongly favourable to it. Otherwise it is weakly favourable to the problem.

Next, the data collected through interview schedule and class observation form were analyzed and interpreted on the basis of the framework that the researcher had already developed in the review of related literature section. The researcher analyzed and interpreted the qualitative data thematically obtained from interview schedule and class observation form.

Chapter IV

ANALYSIS AND INTERPRETATION OF DATA

The data for this study were collected from thirty community based schools in Lalitpur district. Among those thirty schools, twenty schools were situated in urban area and ten schools were situated in rural area. The collected data were tabulated and analyzed according to the objectives of the study. The tabulated data were statistically analyzed and interpreted by using statistical tool: mean weightage. The data were analyzed item wise in the various problems related to teachers who teach mathematics at secondary level in community based school.

The researcher used class observation from (Appendix IV) to observe the class regularity for three days in each sample school. Direct observation was done everyday in the classroom and the classroom behaviour was carefully observed by different outlook of setting and noted.

With the help of semi-structured interview schedule, the interview were taken with the teacher. The interaction with the respondents were categorized according to their category and then different themes were given in the text of interview or in the observation note. These themes were considered as a code and the similar code version of respondents were collected together and finally the themes were explained in their perspectives.

The whole data were categorised seven groups. These groups are construction of teaching materials, selection of teaching materials, use of teaching materials, trainer, opportunity for training, training in classroom and school administration. Thus the collected information were analyzed and discussed under the following topics:

- Problems related to construction of teaching materials.
- Problems related to selection of teaching materials.
- Problems related to use of teaching materials.
- Problems related to trainer

- Problems related to opportunity for training.
- Problems related to training in classroom.
- Problems related to school administration.

Problems Related to the Construction of Teaching Materials

It should not be surprising that current research has established a substantial relationship between the use of manipulative materials and students' classroom. Learning theorists have suggested for some time that children's concepts evolve through direct interaction with the environment, and teaching materials provide a vehicle through which this can happen. This message has been conveyed in a number of ways: Piaget (1971) suggested that concepts are formed by children through a reconstruction of reality, not through an imitation of it; Dewey (1938) argued for the provision of first hand experiences in a child's educational program; Bruner (1960) indicated that knowing is a process, not a product and Dienes (1969), whose work specially relates to mathematics instruction; suggested that children need to build or construct their own concepts from within rather than having those concepts imposed upon them. In view of this, it can be claimed that teaching materials are of great importance and play a vital role in meaningful learning of mathematical concepts.

For the understanding of the problems in construction of teaching materials, the researcher raised some questions like economical support from school administration, income source of school and leisure periods of teachers. These are the area of problems of construction of teaching materials. For effective mathematics teaching, the materials should be of appropriate size and colorful. Now the researcher tried to elaborate the following problems in detail related to construction of teaching materials.

Table 4.1

Problems related to the construction of teaching materials

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
1.	I have got economical support for purchase and construction of instructional materials from the administration.	0	5	6	14	5	2.37
2.	Our school do not have any provision to support in the construction and purchase of instructional materials.	3	12	6	6	3	2.8
3.	The administration has provided me sufficient leisure period to construct and use instructional materials.	0	5	8	7	10	2.5
4.	There are no sufficient leisure periods even to think about construction and use of instructional materials.	6	15	0	6	3	2.5

From above table, it is seen that the mean weightage of first statement is 2.37 which is less than three and indicates that this statement is problematic. In the same way the mean weight age of second statement is 2.8 which is less than 3 and indicates that this statement is a problem. Therefore it is concluded that teachers are not getting economical support for purchase and construction of instructional materials from the administration. Also schools do not have financial provision to support in the construction and purchase of instructional materials. In this regards, the teachers responded as:

"All the facilities of school depend on the economic status of the school but we are suffering from financial crisis. Our school has no additional source of income. In future, we are hoping to get financial support from NGOs or INGOs to buy and construct teaching materials as well as to manage required physical problems." (Teacher Voice)

The above views of teacher indicate that there is a lack of economical sources in the school and therefore the school administration can not provide any economical support to teacher for construction and purchase of teaching materials. The aim of school administration is to manage such problems with the help of some donors.

The mean weightage of third statement is 2.5 which is less than three and indicates that this statement is a problem for teachers. Also the mean weight age of fourth statement is 2.5 which is also less than three and indicates that this statement is problematic. That is there are not sufficient leisure periods for teachers for construction and purchase instructional materials. In this regards, the teacher responded as:

"We have to take six periods out of seven or eight periods. We can not take rest in leisure period because we have to check homework in those periods instead. We have many more responsibilities regarding our family. So we can not give time for the purpose other than school hour." (Teacher Voice)

The above view of teachers cleared that teachers were not getting sufficient leisure periods to construct and purchase instructional materials. Also they can't give their own time for the purpose because they had to take care of their family. Therefore it is concluded that not getting sufficient leisure periods is also one of the problems faced by mathematics teacher in Lalitpur district.

Table 4.2

Problems related to selection of teaching materials

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
5	There is no specific room such as store room or math lab to manage, select, use and demonstrate instructional materials.	0	21	0	9	0	2.6
6	Math lab is available in our school.	0	3	0	26	3	2.23
7	I don't have ICT skills to search in internet and then to select appropriate and innovative instructional materials in internet.	0	3	3	6	18	4.3
8	I am very good at computer and ICT skills to search, select and use instructional materials.	0	18	12	0	0	3.6

From above table, it is seen that the mean weightage of fifth statement is 2.6 which is less than three and indicates that this statement is a problem. Again, the mean weightage of sixth statement is 2.23 which is also less than three and indicates that this statement is a problem for the teachers. That is there is no specific room such as store room or math lab to manage, select, use and demonstrate instructional materials. This created problems for teachers. In this regards, the teacher responded as:

"We have no extra room to keep teaching materials. It is difficult to manage rooms for classes of additional/ optional subjects of grade nine and ten because some rooms are totally damaged due to earthquake 2072. We have no separate room for science lab." (Teacher voice)

The above view of teachers cleared that there was a problem in using mathematics lab because there was no separate room for mathematics lab in selected schools. The science lab is more necessary and primary than mathematics lab but in some schools, there was no science lab as well. The teachers did not have any experience about mathematics lab. The better result was assumed by the use of mathematics lab in school but it was not possible practically yet. So, it is concluded that teachers were blind in selecting and using teaching materials in the classroom teaching.

The mean weightage of seventh statement is 4.3 which is greater than three and indicated that this statement is not problematic. Next, the mean weightage of the eight statement is 3.6 which is also greater than three and indicated that this statement is not a problem for the teachers. Thus the teaches have ICT skills to search in the internet and then to select appropriate instructional materials.

Table 4.3

Problems related to use of teaching materials

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
9	It is difficult to complete the whole course in time if instructional materials are used in teaching and learning activities.	3	21	0	0	6	2.5
10	It is easy to complete the whole course in time using instructional materials.	3	3	3	21	0	2.6
11	I use instructional materials during teaching learning activities but the administration does not care and support to sustain it.	3	12	9	3	3	2.7
12	The administration often support both economically and physically to use instructional materials in teaching.	0	3	12	12	3	2.5

From above table, it was seen that the mean weightage of the ninth statement was 2.5 which is less than three and indicated that this statement is a problem for teachers. Next, the mean weightage of the tenth statement was 2.6 which is also less than three and indicated that this statement was problematic. Hence it is difficult to complete the whole course in time when the teachers use instructional materials in teaching. In this regards, the teachers responded as:

"It is true that teaching materials are necessary for meaningful learning but teaching materials cannot be used frequently in classroom because there were almost fifty-sixty students in the classroom and it get disturbed for sometime if teaching materials were used. Next, classes cannot be run regularly due to different strikes. It is more necessary to complete the course in time than to use teaching materials in the classroom because we have to follow the rules and regulation made by DEO. If there is a problem in completing the course in time by using teaching materials, then how can we use teaching materials in class?" (Teacher Voice)

From above view of teachers, it is concluded that teachers were facing the problems in using teaching materials in the classroom. There was pressure upon teachers to complete the whole course in time from DEO and they gave more priority to complete the whole course in time than to use teaching materials in the classroom. Though teachers wanted to use teaching materials, they were not using teaching materials in the classroom. It was not their wish, but it was their compulsion.

The mean weightage of the eleventh statement was 2.7 which is less than three and indicated that this statement is a problem for the teachers. Again, the mean weightage of twelfth statement was 2.5 which is also less than three and indicated that this statement was problematic. Therefore the teachers are using instructional materials during teaching learning activities but the administration are not caring and supporting to sustain it. In this regards, the teachers responded as:

"In the beginning of the session, teaching materials were made and then used in the classroom too but some of the lazy teachers, who felt jealous, destroyed those teaching materials. sometimes it was found that the materials were being stolen. Though the school administration was not caring about this." (teacher voice)

The above teachers' view shows that teaching materials were destroyed and stolen due to many reasons. The school administration was not responsible to take care of teaching materials and to sustain it.

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

Episode One

"One day the teacher entered into the classroom with daily using materials such as marker, duster, textbook and checked HW copies of the students. All the students stood up and said good afternoon sir as it was second last period, and teacher also told good morning everyone and have your seat please. He wrote the topic probability on the white board and then the teacher discussed with students about general ideas and terminologies of probability. He wrote the definition of fundamental terms of probability like experiment, event sample space, exhaustive events, mutually exclusive cases on the white board. Then the teacher taught it by giving different examples related to probability like tossing a coin, throwing a dice and playing cards orally but he did not use concrete materials even if such materials were available in the school. He solved some problems and allowed students to do the remaining problems of textbook. Teacher helped the students on solving problems for sometime then he went out. After five minutes, he came to the class. Students are asking questions about playing cards and bell rang at the same time.

Teacher informed students to do remaining questions, summarized the class and gave homework"

From the above observed class, it is found that the teachers were not using available instructional materials. he just gave the concept of concrete materials orally only but not practically. So, the students were confused about the events related to dice and playing cards. It was also seen that teachers were teaching their class without any pre-plan, that's they could not summarize and complete the class in time. Regarding this problem, teachers responded as:

"We have only geometry box and daily using materials as teaching materials for teaching mathematics. Some mathematical chart are available in our school for primary level. We are not using audio-visual materials because we don't have such facilities. We don't have such facilities. Also, there is the lack of protection of teaching materials."
(Teacher Voice)

The above mathematics teachers' view cleared that there were not sufficient mathematical teaching aids. It was also seen that there was lack of teaching materials. due to the lack of additional income source and financial crisis of school, school administration could not add required teaching materials also. Moreover, there was no protection for available teaching materials because there was no separate room to keep instructional materials. such materials were kept in office room or staff room haphazardly as well as there was no provision for repairing the damage materials.

The above reality was found by observing their classes. Some episode of their observed classes are as follows:

Episode Two

By observing the class, the observer found that, "One day a mathematics teacher of one of the sampled school entered into the classroom with daily using materials. Then he cleared the white board with duster and wrote the topic: 'Geometry: Area of Traingle and Quadrilateral.' He reviewed

the previous classes and theorems related to the topics. The he prove a problem from exercise of the textbook using related theorems without interacting and questioning with students. After this, he let the students to prove the following problem by giving some hints:

In the above figure, ABCD is a parallelogram and E is a point within it. Then prove that

5 that $Ar(\square ABCD) = \frac{1}{2} (Ar(\triangle ABE) + Ar(\triangle CDE) + Ar(\triangle ADE) + Ar(\triangle BCE))$

Then after students were busy in proving the above problem, and teacher just stood in front of class by observing only the students of first bench. After sometimes, students stopped their pens because of ideas about construction and just after then teacher gave some hints regarding construction on whiteboard. Only three students out of forty four students showed the proof of given problem to the teacher, and rest students were discussing with friends about the proof of given problem. Again the teacher gave hints and completed the construction part on whiteboard. Then he connected the above problem with related theorems. Finally, the teacher summarized the class and gave homework."

The above observation shows that the teacher are not using student centred teaching methods. Also there lack of participatory approach for both students and teachers because the teacher proved the statement himself without involving the students. The teacher taught theorems and students were not participated in that. It is also seen that there was lack of creativity in student to prove and teachers were unable to develop creativity in students. This also proves that individual teaching is not practiced in the class. There is lack of diagnostic test and oral test.

Regarding above problem, teacher responded that "I am not using any fixed teaching method for teaching mathematics. By my aim is how students receive mathematical skills and knowledge, in that way I always go. I begin the topic by using discussion method. My teaching is objective oriented and child centred. (Teacher Voice)

There is contradiction between teachers' view and the reality found by observing the class. Teachers mostly use lecture-method while teaching mathematics.

According to policy statements of NBPTS accomplishing teacher 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 senses, teacher should use the child centred method, co-operative and more collaborative learning in the classroom teaching that makes learning more effective.

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. Indeed, the theory suggests that for a given objective and learner, there is a unique combination of presentation forms that results in the most effective learning experience.

In the modern sense, teacher should have good presentation in the classroom practice that are:

- Planning the presentation in the view of two way communication between teacher as facilitator and learner.
- Planning each and every topic in the hierarchy of knowledge, understanding of knowledge, understanding, skill and higher ability based objectives.
- Awareness about fundamental concept of complexity.
- Planning illustration from simple to complex for the coverage of objectives appropriately.

- Providing maximum opportunity to learner in developing knowledge, understanding skill and higher ability of problem solving by themselves.

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

The causes of becoming above problems are not well participatory approach of both students and teacher while teaching mathematics in classroom, lack of preparation of teacher, lack of diagnostic test and oral test, lack of use of concrete materials, lack of friendly environment in school, lack of appropriate teaching learning method.

Table 4.4

Problems related to trainer

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
13	There is no any training schedule to improve teaching learning activities in our school.	3	18	3	3	3	2.5
14	Training plan/schedule is organized in our school for teachers to improve teaching learning activities.	0	12	0	15	3	2.7
15	Refresher course (training) is organized frequently for us.	0	6	9	15	0	2.7
16	I have not participated in any seminar conducted on mathematics yet.	3	12	6	6	3	2.8
17	Training is not based on need and demand; it is only for formality and up-grading.	3	15	6	6	0	2.43
18	I deliver the knowledge and teaching strategies in	0	7	15	3	5	2.8

class-room whatever I have learned in the training program.						
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From above table, it was seen that the mean weightage of the thirteenth statement was 2.5 which is less than three and indicated that this statement was problematic. Again the mean weightage of the fourteenth statement was 2.7 which is less than three and indicated that this statement is a problem for the teachers. Thus there is no training schedule in most of the school for teachers to improve teaching learning activities.

The mean weightage of the fifteenth statement was 2.7 which is less than three and indicated that this statement was a problem for the teachers. Next, the mean weightage of the sixteenth statement was 2.8 which is also less than three and indicated that this statement was also a problem for teachers. Therefore many teachers has not participated in any seminar conducted on mathematics and this created a problem for the teachers. In this regards, the teachers responded as:

Our school does not have any training schedule for the teachers. Some teachers are only send for training once a year and such training were about possible physical hazards which could occur accidently like earthquake, not about out teaching learning process. Only safe and unsafe palaces, building and things, either within the school or outside the school, are discussing now a days in the training. It is not possible upto now for me to participate in any seminar conducted on mathematics. I am unlucky for this upto now and want to participate if it is possible and our school manage." (Teacher voice)

The above teachers' view indicated that though they were willing to participate in the training in certain interval, they were not getting because the school has no proper schedule for the teachers' training. The teachers were not getting participated in such training which was related to teachers professional development. Instead, the training was conducted on other topics such as physical hazards like earthquake which could occur accidently. The teachers were also not participated in any seminar conducted on

mathematics which could be very important and necessary for teachers for their professional development because to come with fresh and new mind in the classroom is fruitful and hence helpful to increase students' achievement.

The mean weightage of the seventeenth statement was 2.43 which is less than three and indicated that this statement was problematic. Next, the mean weightage of the eighteenth statement was 2.8 which is less than three and indicated that this statement was a problem for teachers. Hence the training is not based on need and demand; it is only for formality and up-grading and this created problem for the teachers. In this regards, the teachers responded as:

It is difficult to handle the class because of large number of students. Next, students should get pass in the examination at any cost, otherwise we have to defense to the school administration and the parents. We have more tension about students in the case of examination result. The job security depends upon the percentage of the students passed in examination. So we prefer to complete the course in time and to make the students passed than to transfer the training skills in real classroom teaching. (Teacher Voice)

The above teachers' view suggested that teachers could not transfer training skills in real classroom because of unfavourable classroom environment. The construction and use of instructional materials is the focused skill in teacher training session. The construction and use of teaching materials is one of the major components of the teacher training package conducted by NCED. Pictorial, printed, and solid instructional materials are also provided in the ten months training package.

Application of training skills in real classroom teaching/ situation is the most important aspect of the study/ training. If there is not transfer of training skills, then the investment of time, money and labour will be useless and there would be question mark behind the whole package. Researcher observed the trained mathematics teachers' classroom and found as follows:

Episode Three

"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 front of the students' desk and reviewed the previous lesson. He wrote the topic of that day 'area and volume of triangular prism'. He described about prism (both triangular and square prism) with solid figures. He just wrote the formulae of lateral surface area, total surface area and volume with geometrical figures. Then he let the students to solve the related problems by using given formulae. Students were asking about how the formulae can be developed but teacher replied 'formula is formula so you have to recite.' Then he checked students' copies and guided to their mistakes. Finally he summarized the topic and gave homework."

From this observation, it is seen that trained teachers were also not implementing their skills in the real classroom appropriately. In the observed school, there were some paper made materials related to the topic but the teacher did not use it. If he used those materials then it would be easier to make students clear about lateral surface area, total surface area, and volume of prism. 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 classroom.

Supervision is an essential part of classroom teaching that awares and gives feedback to the teachers for transfer of training in classroom teaching. The head teacher, resource person and the school supervisor are especially responsible for supervising the class. All the teachers were found to have in favour 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 supervisors were used to come in their school for sometimes only and especially talked to the head teacher but they did not observe the classes regularly.

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

The causes of arising above problems are teacher's carelessness, huge work load, large class size, lack of encouragement, lack of supervision. The main reason\was seemed as teachers' carelessness. Most of the teachers were not conscious and responsible about educational training. If there is a regular supervision, with reward or punishment, then the transfer of teacher training skills would be fruitful. This would be possible also when trained teachers would be participate in some seminar conducted on mathematics.

Table 4.5

Problems related to trainer and materials

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
19	The trainers are not very good at contents to deliver the training.	0	6	6	12	6	3.6
20	Trainer is fully competent and well-qualified in contents.	0	12	9	9	0	3.1
21	Trainers are not well-experienced and skillful like in the use of ICT to deliver the training.	0	15	6	9	0	2.8
22	I don't make and then use daily lesson plan because. It is not practicable I don't have knowledge about it. It is a heavy teaching load.	0	6	3	15	6	3.7
23	The classroom is not equipped with a graph board.	3	18	0	6	3	2.6
24	There is no facility of internet access and ICT lab in the school to search, select and use instructional materials.	0	21	0	9	0	2.6

From above table, it seen that the mean weightage of the nineteenth statement was 3.6 which is greater than three and indicated that this statement is not problematic. Next, the mean weightage of twentieth statement was 3.1 which is greater than and indicated that this statement is also not problematic. Thus the trainers are good at contents to deliver training and this did not create any problem for teachers. But the teachers had the following comments to make:

- 82 percent of teachers (respondents) said that the trainers had no proper techniques, way, method to deliverer the training.
- 75 percent of respondents said that they had come without any preparation to deliver the training.
- 72 percent of respondents said that the trainers were of ten in hurry.
- Almost all respondents said that the trainers had come to deliver the training for money only rather than to give some skills and techniques to the teachers.
- Almost all respondents said that the trainers had lack of experience.

The mean weightage of the twenty first statements was 2.8 which is less than three and indicated that this statement was a problem for teachers. Therefore trainers are not ell experienced and skillful like in ICT to deliver the training and this created a problem for teachers. Regarding this problem, the teachers responded as:

The trainer delivers the training in traditional ways though the present world can't be imagined without use of ICT. The trainer uses whiteboard, marker, cardboard paper and colour pen only to deliever the training. The trainer finds himself in dilemma sometimes while delivering the training. (Teacher Voice)

The above teachers' view cleared that the trainers were not skillful like in using ICT while delivering the training, that's why they were not using ICI: Laptop, overhead projector, related software and many more to deliever the training in interesting, meaningful and purposive way. The trainer was also not well-experienced because he found himself in dilemma sometimes during the training session. The trainer himself was confused and was trying to clarify the confusing subject matter by discussing with the participants in the training.

The mean weightage of the twenty second statement was 3.7 which is greater than three and indicated that this statement was not problematic. Thus the teachers are good in

making and using lesson plans. Though this statement was not a problem for the teachers, the teachers had the following comments to make:

- 76 percent of respondents said that they have heavy teaching load to spare time to making daily lesson plan.
- 50 percent of respondents said that it is not practical and barrier to complete the whole course in time.
- 14 percent of the respondents said that they had no proper knowledge about this.

The mean weightage of the twenty third statement was 2.6 which is less than three and indicated that this statement was a problem for teachers. That is the classroom was not equipped with graph board in the most schools. This created problem for teachers.

The mean weightage of the twenty fourth statement was 2.6 which is less than three and indicated that this statement was problematic. That is there was no facility of internet access and ICT lab in the school to search, select and use instructional materials. This created problems for teachers. Regarding this problem, the teachers responded as:

There is no ICT lab in our school. If it is available here in our school, then I would use it in teaching learning activities and certainly it would increase students' achievement in positive manner. Moreover there is no internet access in our school, otherwise I would use it in learning activities for better achievement.

The above teachers' view suggested that it is very important to have the facility of internet access and ICT lab in the school because the availability of these facilities is very crucial for meaningful teaching learning activities. Furthermore, it could not be imagined better students' achievement in the absence of internet access and ICT lab cause many abstract concept, which is difficult to understand, can be understood easily with the help of ICT.

School administration is responsible for almost all activities those take place in school. It plays a vital role in construction and purchase of teaching materials, managing

training program and many more. For the understanding of problems related to school administration, researcher raised six questions. Those questions with their mean weightage are tabulated below:

Table 4.6

Problems Related to School Administration

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
25	It is compulsion for me to take extra period due to insufficient mathematics teacher	3	3	7	12	5	3.43
26	Our school administration is irresponsible to manage and construct necessary teaching materials	12	6	6	6	0	2.2
27	Lack of refreshment training to teach difficult and rigor topic	3	18	3	3	3	2.5
28	Lack of facilities and award for good performance.	10	7	5	3	5	2.5
29	There is no library in our school.	12	6	0	6	6	2.53

From above table, it was seen that the mean weightage of twenty fifth statement was 3.43 which is greater than three and indicated that this statement is not a problem for teachers. Hence it is concluded that there was no compulsion for teachers to take extra period.

The mean weightage of twenty sixth statement was 2.2 which is less than 3 and indicated that this statement is problematic. Therefore it is concluded that the administration is passive and irresponsible to manage necessary instructional materials.

The mean weightage of twenty seventh statement was 2.5 which is less than three and this indicated that this statement is problematic. Thus it is concluded that school administration could not manage refresher training to teach difficult and rigor topics.

The mean weightage of twenty eighth statement was 2.53 which is less than three and hence it was concluded that school administration had not managed reward for good performance of teachers.

The mean weightage of twenty ninth statement was 2.6 which is less than three and indicated that there was no facility of library in most of the school. Furthermore there was no facility for mathematics journal, dissertation and reference books in the schools.

Regarding above problems, teachers responded that our school administration had no additional source of income. It often suffered from financial crisis. There was no provision for award for good performance of teachers and punishment for poor performance as well. To attract teachers towards teaching, teachers need good facilities and rewards for good performance according to their subject. But they are not getting such facilities.

From above view of teachers, it is concluded that there are many problems regarding school administration and such problems hinders teachers' attraction on teaching and hence students' achievement in mathematics is affected as well. Therefore school administration is required to be careful, good and responsible to address teachers' problems.

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

- Huge teaching loads
- Large class size
- Weak school administration
- No sufficient leisure periods.
- Lesson plans are difficult to construct and follow accordingly.

- Because of much course contents and less class periods available than required, a teacher is left with less options other than completing the course any how at any cost.
- Provision or opportunities should provided where mathematics teachers, could sit, contemplate and interact about the problems and recommend optional solutions and alternatives to the problems
- Workshop and sort time training about mathematics teaching learning activities should be provided to deal with the newly added topics. Such as probability, trigonometry, vectors, transformation, compound interest etc.

Chapter - V

SUMMARY, FINDINGS CONCLUSIONS AND RECOMMENDATION

Summary

The purpose of the study was to identify the levels and extents of problems faced by mathematics teachers. The main objectives of this study was to identify and to analyze the major problems faced by teachers while teaching mathematics at secondary level in Lalitpur district.

The specific objectives of this study were to identify the problems faced by mathematics teacher due to the construction of teaching materials, to identify and analyze the problems related to selection of teaching materials, to identify the problems related to use of teaching method and materials to identify the problems related to trainer, to identify the problems related to training and its transfer in classroom with teaching materials, to identify the problems related to school administration and to suggest some measures for the solutions of those problems.

For the convenience of this study, the problems were categorized into six different areas, viz. construction of teaching materials, selection of teaching materials, use of teaching materials and method, training and its transfer in classroom teaching, trainer, and school administration.

This study was entirely survey type. The researcher himself developed questionnaire under the guidance of supervisor. The questionnaire, classroom observation and interview schedule were main tools of this study. The responses were collected from mathematics teachers of sampled schools, in Lalitpur district, selected by purposive sampling method. The data collected from questionnaire were quantified based on Likert five point scale. Open questionnaire were included in each category of problems, and descriptive analysis of collected responses were carried out. As statistical indicator, mean weightage was used for the analysis and such analysis was authenticated by qualitative data obtained by class observation form and interview schedule.

Major Findings

From the field survey and statistical analysis of the collected data authenticated by qualitative data, it was found that teachers had been facing a number of problems during the course of teaching mathematics at secondary level. On the basis of analysis and interpretation of the data, the major findings of this study are presented below:

- Teachers do not construct and purchase appropriate teaching materials for teaching of mathematics.
- There is a lack of facility of ICT and internet for selection and use of teaching materials to teach mathematics in modern way.
- There are not sufficient teaching materials in schools and teachers are not using available teaching materials as well.
- The school administration is found to be not strong.
- Teachers are found not using student centered method, they mostly use lecture method.
- Trainers are good at contents but poor at the use of ICT and still they are delivering the training in traditional ways. They are being selected as trainers because of political activities. They come to deliver training without any preparation and they are often in hurry and trying to end the training session as soon as possible.
- Most of the schools have no any proper schedule for refreshing training to deal with new challenges that take place during teaching learning activities. Moreover they are not participating in ICT training although they want to do so.
- Teachers' qualification, training, experience are strong in average but they are not applying their skills and knowledge gained from training in real classroom teaching.

- Schools are suffering from financial crisis as they do not have additional source of income.
- Teachers are not getting sufficient leisure period.
- There is no protection for available teaching materials for further use.
- Teachers must complete the course anyhow in time.
- The school administration doesn't manage refreshment training to teach difficult and rigor topics in simple and interesting way.
- Training is only for formality and there is no provision of reward and punishment.
- Most of teachers are not conscious towards training for their professional development.
- There is a lack of regular supervision of school and teachers from related agency.

Conclusion

From the above stated findings of this study, it can be concluded that teaching learning activities of mathematics are not satisfactory in Lalitpur district because the teachers in Lalitpur district are facing a number of problems due to construction and purchase of teaching materials, selection of teaching materials, use of teaching materials and method, teachers' training and its transfer in real classroom teaching, trainers with their knowledge, skill, experience and finally due to weak school administration.

More interestingly, it is found that necessary teaching materials are not available and teachers are not using available teaching materials too. According to teachers, we can not use teaching materials because of crowded class, large number of students, inappropriate school environment and pressure in the sense that the course must be completed in time at any cost. Lack of proper teaching materials and methods, unavailability of math lab and ICT lab, lack of ICT training for the teachers, lack of implementation of training skills in real classroom teaching, weak school administration are burning problems faced by mathematics teachers of secondary level in Lalitpur

district. Next, negative attitude towards mathematics and taking it as a difficult subject is a major psychological problem for teachers.

Recommendations

On the basis of above findings and conclusions, the following recommendations are made:

- Government of Nepal should supply the essential and necessary teaching materials as well as should encourage the school administration to purchase and manage such teaching materials.
- The head teacher and the school management committee should create appropriate educational environment in the school.
- Teacher should create mathematical environment in both class as well as in school.
- Use of lesson plan with appropriate teaching methods and materials should be encouraged.
- Mathematics teachers should be resource persons for students. It means they must be competent in mathematics and should be good performers.
- Schools need to establish math lab and ICT lab.
- Teachers should be good at the use of ICT.
- Mathematics teachers are required to use suitable teaching method and materials for teaching and learning activities of mathematics to motivate students and to create interest in them about mathematics.
- Frequent short time training as well as ICT training should be organized for teachers for their better professional development.
- A resource centre level as well as district level exhibition of teaching materials should be conducted.

- School administration should be strong and this is possible by making good and positive co-ordination among teachers head teacher and school management committee.

Recommendation for Further Study

The researcher has made following recommendation for further study:

- Similar study can be carried out with large sample size and various schools of different parts of Nepal.
- Same study related to the problems faced by students for the achievement on mathematics can be conducted.
- Similar study on the basis of class wise and other level wise can be conducted.
- The study about problems related to mathematics curriculum, textbook and its relevancy to the context of multicultural classroom can be one of the areas for the further study.

BIBLIOGRAPHY

- Baral S. K. (2000). *A Study of the Problems Faced By Mathematics Teachers in Implementation of Compulsory Mathematics Curriculum in Grade Ix*. Master's thesis; faculty of education T. U., Kirtipur.
- Basnet D. (2003). *Teaching Problems Faced by Mathematics Teachers in Existing Curriculum of Grade Eight*. Master's thesis; faculty of education, T. U. Kirtipur.
- Bell, F.H. (1978). *Teaching learning mathematics at secondary school*. www. Company publisher, U.S.A.
- Best, J.W. and Kahn, J.V. (1993). *Research in education*, (Tenth edition) New Delhi: Prentice of India.
- CERID (1998). *Evaluation System in Primary School of Nepal Kathmandu*.
- Dhital, K. P. (1985). *A Study if Problems Facing the Teaching of English at Lower Secondary Level in Dhankuta District*. Master's thesis; Faculty of Education, T. U. Kirtipur.
- Eves, H. (1983). *An Introduction to History of Mathematics*, Fifty Education, Saunder's College Publishing.
- Goetting, M. Lm (1941). *Teaching in the Secondary School*. New York: Prentice – hall.
- Heddens J. W. (1964). *Today's Mathematics*, Second Edition California: Science and Research Associates inc.
- HMG (2057 B. S.). *Mathematics Curriculum of Primary Education*. Ministry of Education, Education Department, Curriculum Development Center, Sanothimi.
- Kirkire, P.L. (1981). *Analyzing the impact of objective based lesson plans on the classroom verbal interaction on pupil achievement in mathematics*. Ph.D. thesis, Indore University.

- Koul, L. (2004). *Methodology of Educational research* (fourth revised and enlarged edition) New Delhi: Vikas Publishing.
- Linn, R.L. and Miller, M.D. (2005). *Measurement and Assessment in teaching* (ninth edition): Pearson prentice Hall of India.
- Maharjan, H.B. et.al. (2010). *Teaching mathematics is secondary school*, Kathmandu: Buddha Academic publisher.
- Pandit, R.P. (1999). *Problem faced by Mathematics teachers education in the implementation of three year B.Ed. level mathematics curriculum*. Submitted, Master's thesis, T.U.
- Parajuli, T. R. (1999). *Relevance of Primary School Curriculum in Nepal*. Ph. D. thesis Banaras Hindu University.
- Pathak, B. R. (1986). *A Study on the Problem Faced by the Teachers in Kathmandu District in the Implementation if Mathematics Curriculum for Lower Secondary School*. Master's thesis Department of Mathematics Education, T.U. Kirtipur.
- Stinnett, T. M. (1968). *Professional Problems of Teachers* (3rd edition). New York: The mac-millan Company.
- Taneja V. R. (1997). *Educational Thought and Practice*: sterling Publishers, Pvt. Ltd. New Delhi.
- Thapa B. K. (1999). *Financial Education in Developing Countries Implication of Nepal*. Unpublished Ph. D. thesis, Development of Education Administration, University of Alberta.
- Upadhyay H. P. (2061). *Teaching Mathematics, Kathmandu*: Ratna Pustak Bhandar, Nepal.

APPENDIX-I

NAME OF SAMPLED SCHOOL

RURAL AREA

S.N.	School's Name	Location
1	Shree Baghbairava S.S.	Kaleshwor
2	Shree 5 Mahendra S.S.	Thuladurlung
3	Kalidevi S.S.,	Bukhel-7
4	Mahakal S.S.	Gotikhel-2
5	Buddhabhagwan S.S.	Maanikhel-8
6	Vidhyadhiswori S.S.	Aasrang-6
7	Janak S.S.	Gimadi-1
8	Narayani S.S.	Gimadi-5
9	Chandeswori S.S.	Pyutar-4
10	Kalidevi S.S.	Pyutar-1
11	Baleshwori S.S.	Bhardeu-1
12	Gothbhanjyang S.S.	Dalchauki-3
13	Magargau S.S.	Shankhu-5

URBAN AREA

S.N.	School's Name	Location
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1	Balkumari S.S.	Sunakothi-6
2	Saraswati S.S.	Thecho-8
3	Banibilas S.S.	Chapagau-5
4	Bajrabarahi S.S.	Chapagau-3
5	Udaykhark S.S.	Chapagau-8
6	Saraswati S.S.	Lele-2
7	Namunamachindra S.S.	Lagankhel-15
8	Shramjeet Kishor S.S.	Lalitpur-14
9	Prabhat S.S.	Lalitpur-17
10	Pathpardarshak S.S.	Badikhel-2
11	Kitney S.S.	Godavari-1
12	Buddha S.S.	Chhampi-3
13	Chhampidevi S.S.	Chhampi-2
14	Bheemsen Aadarsha S.S.	Devichaur-1
15	Devi S.S.	Devichaur-4
16	Tika Vidhyaaashram S.S.	Lalitpur-2
17	Mahendra Aadarsha S.S.	Satdobato-3

APPENDIX-II

**PROBLEM FACED BY TEACHER IN TEACHING MATHEMATICS AT
SECONDARY LEVEL**

SURVEY QUESTIONNAIRE FORM

Respected Teachers

I am a master's degree student of Mathematics Education, Central Department of Education, Kirtipur, Kathmandu. I am writing a thesis entitled on "A study on the problem Faced by 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 problems within it as well as problem faced by teacher in teaching. So to complete this thesis, I have prepared some questionnaires 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 is used for this study and your answer is kept secret.

Researcher
Sanjeet Sah
Department of mathematics
Education, Kirtipur,
Kathmandu, Nepal

Section A

Teacher's Bio-Data Form

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

Section B

This is a humble request to you to read each of the statements described in the questionnaire carefully and express honestly your opinion by putting tick marks (√) at the appropriate space where

SA = strongly agree

A = agree

U = undecided

DA = disagree

SDA = strongly disagree

S. N.	STATEMENT	RESPONSES OF THE TEACHERS					Mean weight age
		SA	A	U	DA	SDA	
1.	I have got economical support for purchase and construction of instructional materials from the administration.	0	5	6	14	5	2.37
2.	Our school do not have any provision to support in the construction and purchase of instructional materials.	3	12	6	6	3	2.8
3.	The administration has provided me sufficient leisure period to construct and use instructional materials.	0	5	8	7	10	2.5
4.	There are no sufficient leisure periods even to think about construction and use of instructional materials.	6	15	0	6	3	2.5
5.	There is no specific room such as store room or math lab to manage, select, use and demonstrate instructional materials.	0	21	0	9	0	2.6
6.	Math lab is available in our school.	0	3	0	26	3	2.23
7.	I don't have ICT skills to search in internet and then to select appropriate and innovative instructional materials in internet.	0	3	3	6	18	4.3

8.	I am very good at computer and ICT skills to search, select and use instructional materials.	0	18	12	0	0	3.6
9.	It is difficult to complete the whole course in time if instructional materials are used in teaching and learning activities.	3	21	0	0	6	2.5
10.	It is easy to complete the whole course in time using instructional materials.	3	3	3	21	0	2.6
11.	I use instructional materials during teaching learning activities but the administration does not care and support to sustain it.	3	12	9	3	3	2.7
12.	The administration often support both economically and physically to use instructional materials in teaching.	0	3	12	12	3	2.5
13.	There is no any training schedule to improve teaching learning activities in our school.	3	18	3	3	3	2.5
14.	Training plan/schedule is organized in our school for teachers to improve teaching learning activities.	0	12	0	15	3	2.7
15.	Refresher course (training) is organized frequently for us.	0	6	9	15	0	2.7
16.	I have not participated in any seminar conducted on mathematics yet.	3	12	6	6	3	2.8
17.	Training is not based on need and demand; it is only for formality and up-grading.	3	15	6	6	0	2.43
18.	I deliver the knowledge and teaching strategies in class-room whatever I have learned in the training program.	0	7	15	3	5	2.8
19.	The trainers are not very good at contents to deliver the training.	0	6	6	12	6	3.6
20.	Trainer is fully competent and well-qualified in contents.	0	12	9	9	0	3.1

21.	Trainers are not well-experienced and skillful like in the use of ICT to deliver the training.	0	15	6	9	0	2.8
22.	I don't make and then use daily lesson plan because. It is not practicable I don't have knowledge about it. It is a heavy teaching load.	0	6	3	15	6	3.7
23.	The classroom is not equipped with a graph board.	3	18	0	6	3	2.6
24.	There is no facility of internet access and ICT lab in the school to search, select and use instructional materials.	0	21	0	9	0	2.6
25.	It is compulsion for me to take extra period due to insufficient mathematics teacher	3	3	7	12	5	3.43
26.	Our school administration is irresponsible to manage and construct necessary teaching materials	12	6	6	6	0	2.2
27.	Lack of refreshment training to teach difficult and rigor topic	3	18	3	3	3	2.5
28.	Lack of facilities and award for good performance.	10	7	5	3	5	2.5
29.	There is no library in our school.	12	6	0	6	6	2.53

Any other problem:

.....
.....

APPENDIX-III

GUIDELINES FOR INTERVIEW WITH MATHEMATICS TEACHER

Name:..... Qualification:.....

Age:..... Sex:.....

Teaching experience: Training:.....

School's name:.....

Location: Rural/Urban

The interview with mathematics teacher was taken on the basis of following topics:

- Mathematical instruction, methods and materials, encouragement, relative question, lesson plan, effectiveness, use, time etc.
- Teacher's training and its transfer in classroom teaching.
- School administration
- Mathematical seminar, conference and training.
- Other special technique, strategies, activities of teachers while teaching mathematics
- School administration.
- Causes of problems and way to solution etc.

Name of teacher.....

APPENDIX-IV

CLASSROOM OBSERVATION FORM

Name of teacher.....

Gender: a. Male b. Female

Teaching experience:.....

School's name and Location:.....

Class:..... Period:..... Time:.....

Topic:.....

Total number of students:..... Male Female

Time spend by teacher in classroom.....

a) Mention the striking points of the lesson.

(i) Selection and use of teaching materials

(ii) Use of teaching method and ICT

(iii) Transfer of training in classroom.

.....

b) Mention the observed problem on learning.

.....

.....

c) Suggestion to improve the teaching of the lesson.

.....

.....

Observer's Name:..... Date:.....

