

Chapter I

INTRODUCTION

Background of the Study

Mathematics as an expression of human mind, results from the discovering the formulation, the systematic development and the application patterns of inductive and deductive thinking. Mathematics is an essential part of human life. It is originated along with the different human civilizations. The word "Mathematics" is derived from the mother language word "mathematician" which means to learn. Its basic elements are logic and intuition, analysis and construction, generality and individuality. It is discipline for historical civilization. It is continuously been developed and changed with changing needs of contemporary society. Our life would be dark and lame without mathematics. Hume beings are most curios and sensible creatures to which mathematics is necessary in every moment.

The following are the views of different mathematicians in defining the mathematics:

"Mathematics is a free invention of the human intellect." (Einstein)

"Mathematics is the gate and key of all sciences." (Roger Bacon)

Mathematics is the science. Which draws necessary conclusions.' (Pierce)

Mathematics is a study of pattern. It is through mathematical description that regularities and similarities in nature can often be clarified mathematics is the language of science and as such user carefully defined terms and symbolic representation that enhance our ability to communicate. Mathematics in each proposition follows as logical consequences of proved proposition of assumption and rules of logic.

Geometry is one of the most useful and important branch of mathematics. Geometry includes an enormous range of ideas and can be viewed in many different

ways. It has been interlocked with many other subjects and different views of human activities. The basic ideas of a mathematical system originated in geometry. Kelly and Ladd (1986) write, "it is not certain who first had idea of trying to prove a mathematical rule by reasoning rather than by testing it in different ways". The word geometry is derived from the Greek words, geo metria (meaning measuring). As such, geometry was initially conceived as the study of measurement of the earth. On the other hand, in the east this subject was called 'Rekhaganit'. About the development of geometry Butter and Wren say, primitive people obtained their first knowledge of geometry from natural objects and later on from arts as well the needs that arose to understand and came to further the legacy of art, architecture, surveying, measurement etc. provides the stimulators the development of science and similarly come into existence and provide a strong foundation for the science of geometry" (Butler and Wren, 1941)

The shape, size and other properties of figures and the nature of space are the area of geometry. It is the branch of mathematics that deals with the measurements and relationship of lines, angles, surfaces and solids. Geometry is the science of space and extend. It deals with position, shape size of bodies but has nothing to with their materials for physical properties.

School mathematics curricula of Nepal have given emphasis on geometry learning from the beginning of schooling. The curricula have aimed to develop students understanding of intended geometric concepts at primary, lower secondary and secondary level. Similarly geometry is one of the content standards of school mathematics, which aims at developing special reasoning, problem solving skills and communicating. Moreover about the importance of thinking skills in geometry. 'A vision for school geometry (2005) writes, "reasoning is fundamental to mathematical activity." Active learner's questions, examine, conjecture and experiment. Mathematics

programs should provide opportunities for learners to develop and employ their reasoning skills. Learners need varied experiences to construct a problem setting and to evaluate the arguments of others (A vision for school geometry, 2005). Thus geometry is regarded as a core content area of school mathematics program. It is the most important and integral part of school mathematics curricula showing the importance of geometry, Vance (1973) writes it is a way of modeling our physical environment and because there is a great abundance of models suitable for all levels.

Problems relating to geometry learning might have affected the achievement in teaching of mathematics. This is the great challenge to the mathematics teacher. Some problems of learning geometry in students might directly be related to the teacher's academic background, classroom practices, school management, leadership and others. Such situation might affect the efficiency and potentiality of students performance (Basnet, 2001).

Teachers are the important agent for the successful implementation of mathematics curriculum. Only by hard work of the teachers the mathematics curriculum -can be successfully implemented successful teacher is he who can influence upon the attitude of students to mathematics learning.

There are various researches about teachers and students problems. Many government and non-government official research indicate the investment of huge amount of time and money to find the problems of teachers and students. But satisfactory result was not found. Hence no successful solution can be found to address the students so many problems that are occurring frequently.

That is why the researcher decided to make a systematic study on the topic. "Problems Faced by Students and Teachers Geometrical Content at Secondary. Level of Sarlahi District."

From the above study, it is usually seen that those students and teachers who are the users of mathematics curriculum are facing with the following problems to deal other sources of problems in the implementation of mathematics curriculum were:

-) Teaching learning activities
-) Physical facilities
-) Classroom management
-) Unavailability of instructional materials and lack of knowledge of how to use it.
-) Pre-knowledge/background of the pupil.
-) Economic factors
-) Evaluation system.

About the modern mathematics classroom, Bhatia and Bhatia (1987)- said that the teacher's tools have long consisted of chalk, blackboard, pencil and text book. However, today is to use demonstration models of various shape and size, drawing instruments, graph stencils, measuring instruments, many pictures pamphlets, books and mathematical magazines. Films, slides, manipulative are being used in teaching mathematics in the modern classroom. But the learning in Nepalese schools is totally based on textbooks. 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 the teachers the textbooks as an ultimate means of teaching that do not provide the opportunity of relating their learning with local context because of financial problem. Nepalese schools could not provide money to spend in materials and equipments. Some schools do not have enough classrooms. A large number of students are packed in a small classroom. Thus the crowded classroom is one of the major problems of implementing interactive teaching and learning situation.

Classroom is not well lighted and well ventilated. Physical facility such as teaching materials, mathematics lab, computer and collection of low cost and cost free materials that are essential for teaching and learning activities are not organized properly by concerned agencies.

Research Views on the Van Hiele Theory

Based on their pedagogical experience and their, teaching experiments, the van Hieles (husband and wife) proposed a psychological/pedagogical theory of thought levels in geometry (English version in Geddes et al., 1984). For many researchers, such as Schoenfeld (1986), .this model of thought levels provides a useful empirically-based description of what are likely to be relatively stable, qualitatively different, states or levels of understanding in learners. Accompanying this model of thought levels, the van Hieles proposed a model of teaching that specifies five sequential phases of instruction. The van Hieles suggests are a means of enhancing students' thinking from one thought level to the next. This model of teaching phases, as discussed below, is used as the main theoretical framework for this paper.

Originally, and in an attempt to understand the structure of geometry learning, Dina van Hiele-Geldof (see, Geddes et. al, 1984, pp217-223) focused on analyzing the relationship between student and subject matter in elementary geometry. As a result of her research, she suggested five teaching phases which, for the purposes of this paper, are termed as follows: 1) Information; 2) Guided Orientation; 3) Explication; 4) Free Orientation; 5) Integration (adapted from Clements and Battista, 1992, pp430-1; Geddes et al, 1984, p223; Hoffer, 1983).

At this point it is worth noting Hoffer's (1983) view that the third phase (Explication) was incorrectly given by Wirszup (1976,p83) as 'explanation', with Hoffer taking the view that, in this third phase, it is essential that "students make the

observations explicitly rather than receive lectures (explanations) from the teacher" (Opcit, P208). Furthermore, Clements and Battista (1992, pp430-1) call the second phase Guided Orientation rather than use the Geddes et. al term Direct Orientation.

Whatever the terms used, and the above illustrated some of the unresolved issues about the choice of terminology, the model is quite loose in that, as Schoenfeld (1986, P252) explains, and as Whitman et al (1997) found, the nature of the pedagogical sequence is far from clear. Not only that, but the model is more a suggested process than a fixed formula, it is not at all obvious whether it is necessary for the teacher to go through each and every phase. Indeed, Hershkowitz (1998) is of the view that the van Hiele theory does not account well for the relationship between the context of the learning environment and the mathematical reasoning being developed. She suggests more context-specific research and this matches the call by Whitman et. al, (ibid P217) for more research . to evaluate the use of the van Hiele theory with students of different cultural backgrounds. In general, the existing van Hiele-based research has yet to address systematically any of these issues concerning the nature and specification of the teaching phases.

To contribute to the research base for this aspect of the van Hiele theory, and following Whitman et. al, (1997), the data reported in this paper come from a study aimed at seeing how well the van Hiele model of the five teaching phases accounts for the pedagogical methods used in teaching deductive geometry in classrooms in Jakarta. The key research question being addressed is to what extent the van Hiele model of five teaching phases accounts for the teaching of geometric proof by successful teachers in Sarlahi's classroom.

Statement of the Problem

The new curriculum of mathematics (Geometry) in secondary level has been implemented in Nepal since 2055 B.S. and the students in average have become under the achievement. So it is well appropriate to discuss about the teaching and learning problems facing by students and teachers to improve the condition of teaching and learning geometry. This study should to answer the following research questions.

-) What are the problems faced by the secondary students in learning mathematics?
-) Do the problems faced by the students in institutional school differ from community school in learning geometry?

Significance of Study

Mathematics is an essential part of school curriculum of Nepal. It has been taught as compulsory subject at all level of school education program. Also mathematics is included as optional subject at secondary level education. Although mathematics has been given an important place in the curriculum of all levels of school education. Most of the students are weak in mathematics and hence it is felt that most of the students dislike mathematics and afraid of it. The result of S.L.C. examination shows that most of the failures were in mathematics.

There may be many factors that hinder students' progress in this subject. Most of the teachers and students take geometry as difficult and abstract subject. Most of the teachers give low priority to geometry teaching from the lower classes. As a result, most of the students lose their interest in learning geometry and they have poor motivation in geometry classes. Moreover, many students have a wrong impression about the need of geometry and seem to fear and even hate geometry.

There are various reasons behind this research work as lack of physical facilities

which are essential for teaching learning activities, unavailability of experienced and trained mathematics teachers in various schools, unavailability of textbook in time, print mistakes in textbook, lack of instructional materials, unavailability of teacher's guide, large size of class, heterogeneity of students, inability of the students in subjects inspired me to conduct the research problem might have arise because of the confusion about the subject matter. Problems also arise because of the lack of knowledge about the proper class management.

In this research the learning problems being faced by the mathematics students and teachers were the main focused of the study. Therefore, this study would provide some logical and valuable information about the current problem of mathematics with the following significance.

-) It would explain about the problems, are being faced the mathematics students.
-) It would certainly improve the mathematics problem by means and ways that one being faced by students.
-) It would help in designing a revised mathematics curriculum at secondary level.
-) It would help for the successful implementation of the mathematics curriculum.
-) It would help to create sound environment to parents as well as concern administration.
-) It would set up the implementation of mathematic curriculum in the present context and may be ground for the further researchers in this issue.

The most significance aspect of this study was to be sure whether the

mathematics students face only academic problems or other problems also.

Objectives of the Study

The objectives of the study were as follow:

-) To find the problems faced by the students in learning geometry at secondary level.
-) To examine whether there is significance difference between problems faced by community and institutional school students in learning geometry.

Delimitation of the Study

This study was limited to the following facts:

-) This study was concerned with only the problems faced by the students of grade X in learning geometry.
-) The study was conducted in Sarlahi district.
-) The data of this study were generated through the questionnaire, and interview schedule.
-) This study was limited to the classroom activity, teaching approach, content and teaching materials and assessment and feedback process.

Definition of Related Terms

Community school: Community schools are those schools, which receive regular logistic and financial support from the government.

Institutional school: Those schools, which are established by individual or community and do not get regular logistic and financial support from the government.

Students: The students who are studying at secondary level.

Teachers: Teachers who are teaching mathematics at secondary level. **Geometry:** The science that treats of the shape and size of things, the science of properties and relations of lines and solids.

Problems: According Oxford Advanced Learners Dictionary (2005) defines the problem as any statements have solutions. Problems are that thing which is difficult to deal with or to understand during learning mathematics.

These statements which have solution are said to be problems. In this study problems in mathematics are the difficulties of mathematics students.

Physical facilities: The physical aspect .of classroom is itself a physical environment of the classroom, which includes different variables such as classroom arrangement, seating patterns and materials and number of inhabitants.

Curriculum: Mathematics curriculum which had been implemented at present at secondary level.

Supervisors: **The** authorized person from District Education Office evaluating supervision on the schools activities and giving counseling to teachers as well as head teacher is termed as supervisors.

Chapter II

REVIEW OF RELATED LITERATURES

Review of related literature is an essential part of research for the researcher because literature helps and guides research to meet theoretical way for the study. Literature provides authentic and strong knowledge. Mainly the literatures are previous thesis, books and journals, different sources use to site literature. In this regard the following are the related literature in this study.

Empirical Literature

Pathak (1987) conducted a research on "A study of the problems faced by the teacher of Kathmandu district in the implementation of mathematics on of mathematics curriculum for lower secondary level". He took sixty five teachers as the sample of lower secondary level of Kathmandu district. He administered a set of questionnaire to the lower secondary mathematics teacher who has faced problems regarding the problem of mathematics curriculum teaching method and evaluation techniques. Then he concluded that the problems regarding evaluation was that most serious problem to the lower secondary level mathematics teachers.

Shrestha (1991) conducted a thesis "A study of sex difference in achievement in mathematics of ninth grade students in Gorkha district." The nature of this study was descriptive survey types. He selected five schools of Gorkha district randomly. From each school, forty mathematics students of grade IX were selected as a sample for the study. For the collection of data he used questionnaire and interview schedule. The obtained data were analyzed and interpreted with the help of t-test and analysis of the variance. The findings of the study show that different problems creators were responsible such as gender discrimination, traditional concept, study hour at home and less interest in study of mathematics were the main indicators to create problems.

Pandit (2001) in the article "Problem faced by mathematics teacher educator in the implementation of three years B.E d. 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 and aids student's weak background in the subject matter lack of opportunity given to upgrade their knowledge and huge number of personal problems of lectures. About the problems in teaching mathematics Pandit (1999), writes in his own article teaching mathematics as the mathematics teacher may face different kind of problems while teaching- further there may be problems related with mathematic education program which directly or indirectly affect to mathematics teaching. The problems as a whole can be divided into two part.

-) Problems in mathematics-education
-) Problem faced by them while teaching mathematics in real classroom situation.

On the course of searching related literature researcher was able to get some other related literature, which provided some information to this study.

Lamichhane (2001) did a descriptive survey type research on "A study of problem faced by the secondary level mathematics teachers in teaching mathematics" in Kaski district. Eighteen schools were selected randomly from each of the strata (i.e. 11 urban and 7 rural) by using the random number table. The questionnaire was filled and observation form used to collect the data. Mean weight age and t-test were used to analyze and interpret of data. The major finding of the study is the several problems proposed up in the eyes of teachers such as inadequacies of textbook and teachers guide, lack of instructional materials, teachers' training, lack of supervisory help and lack of physical facilities etc. Further he concluded that the lack of motivation to learn mathematics is poor on the part of students.

Basnet (2003) conducted a thesis entitled "Teaching problems faced by the mathematics teachers in existing curriculum of grade eight." The nature of the study was descriptive. Ten schools from urban and fifteen schools from rural area were selected randomly in Jhapa district. So that, altogether 25 mathematics teachers, teaching in grade eight and 125 students studying grade eight were included in the sample. The main tool of the study was questionnaire. Simple percentage was used to analyze and interpret of the data. It can be concluded that the 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 o training, orientation opportunity for the mathematics teacher in existing curriculum, inadequacy of textbook, rack of teachers' guide and reference book, lack of instructional materials lack of physical facilities in the classroom, large class size, defective evaluation system and so on.

Bhattarai (2005) made a study entitled "The problem faced by the mathematics students in existing curriculum." This study being descriptive in nature. Twelve schools from urban in Ilam district were selected by simple random sampling method as well, from each school one teacher and four students were chosen respectively. The main tool of the study was questionnaire. The questionnaire was developed into three point likert scale. The collected data are analyzed by calculating percentage. The major finding of this study are concluded that learning mathematics in secondary level is disturbed by so many factors such as lack of teachers' involvement in classroom planning, lack of referential and instructional facilities and aids, students' weak background in the subject matter and so on.

Attreya (2006) concluded a research entitled "A study of problem faced by mathematics teachers to maintain positive discipline in secondary level classroom." He used both qualitative and quantitative measures to collect data. He took seven schools

from three different districts, three from Gulmi, two from Kavre and Two from Kathmandu. The findings of the study show that different problems creators are responsible such as problems due to classroom management, administration, school environment, students' activities, curriculum, methods of teaching and social and economic status were the main indicators to create problems. Not only that disciplinary problems due to crowd, lack of furniture, unmanaged seat planning, irregularity, lack of trained teachers, gap between students-teachers-parents are also some problems create factors.

Sapkota (2008) conducted a study on the topic "Problems faced by students in mathematics learning and its impact in the examination." The study followed the rational of the descriptive research design. The students of class nine and their mathematics teachers were sample of the study. The researcher selected four schools. Out of four schools, two schools were selected from the urban areas and two were of village areas. Similarly, twenty five students from each school were selected as sample so all together one hundred sampled students were selected to the study purpose. Questionnaire and interview schedule regarded as the main tools of the study. The obtained data were analyzed and interpreted with the help of mathematical calculation mean weight age.

The major findings were as completion course in time, receiving books in time and frequently taking unit test which indicates the problems faced by students in their mathematics learning. Also the problems were found to the teachers' discrimination to the weak and talent students students did not have positive attitude towards mathematics teacher and did not find the interest of solving new mathematics problems by students. Availability of mathematics lab in schools, learning difficulties in classroom, friendly school environment and teachers' difficulties due to large number

of students.

KC (2009) conducted a thesis "A study of problems faced by students in compulsory mathematics at secondary level." The nature of this study was quantitative as well as qualitative. This study followed survey design. He selected six schools from urban area of Lamjung district randomly. Among them three were institutional and three were government schools. From each school, one mathematics teacher and three mathematics students of grade X were selected as a sample for the study. For the data collection, a set of class observation form and interview schedule were used. The obtained data was analyzed and interpreted with the help of mean weight age.

The major findings of this study were illiterate parents, poverty of parents, lack of encouragement for study, the gap of low achievement and high achievement students, unavailability of teaching learning materials, lack of mathematics lab, lack of trained teacher, lack of physical facilities and sufficient budget for school. It concluded that there had been significant problems in learning geometry at secondary level.

Paudel (2009) did a study on "A study on the problems faced by grade VIII students in mathematics." He took eight schools for study. Among them three schools were selected from urban area and five were selected from rural area. From each school six students and one Mathematics teacher were selected for the study. Both the boys and girls students were equally selected. The study followed the descriptive survey method. The questionnaire and class observation form were the main tools for data collection. The obtained data were analyzed with the help of mathematical calculation mean weightage and observation note.

The following major findings were derived

The major problems were as the involvement of student in house work more than student in household work more that study, illiteracy of parents, lack of

pre-requisite knowledge on the students of mathematics, irregularity of students in school, congested classroom, unavailability of physical facilities and lack of trained and experienced teachers.

After studying overall literature, the researcher found that desired significant steps have not been made to study the problem of mathematics students in geometry at grade ix. Hence, this study was concentrated in the problems faced by students in geometry at secondary level of Sarlahi district.

Theoretical Literature

Two Dutch educators, Dina and Pierre Van suggested that children may learn geometry along the lines of a structure for reasoning that they developed in the 1950s, educators in the former Soviet Union learned of the Van Hiele research and changed their geometry curriculum in the 1960s. During the 1980s there was interest in the United States in Van Hiele's contributions of the National Council of Teachers Mathematics (1989) brought the Van Hiele model of learning closer to implementation by stressing the importance of sequential learning and an activity approach. The five levels of geometry thought (Numbered levels 0-4 or 1-5) do not correspond with student's age. As students develop the cognitive skill necessary to master one level, they progress to the next.

The mental development levels of instruction as suggested by Van Hiele's Theory are given below:

Level 0 (Basic Level): Visualization

Students recognize figures as total entities (Triangle, square) but do not recognize properties of these figures (right angles in a square)

Level 1: Analysis

Students analyze component part of the figure (opposite angle of parallelograms

are congruent) but, interrelationship between figures and properties cannot be explained.

Level 2: Informal deduction

Students can establish interrelationship of properties within figures (In a quadrilateral, opposite sides being parallel necessities opposite angles being congruent) and among figures (a square is a rectangle because of has all the properties of a rectangle) informal proofs can be followed but students do not see how the logical order could be altered not do they see how to construct a proof starting from different or unfamiliar premises.

Level 3: Deduction

At this level the significance of deduction as a way of establishing geometric theory within axiom system is understood. The interrelationship and role of undefined terms, axioms, definitions, theorems and formal proof is seen.

Level 4: Rigor

This level of geometric thinking most often applies to college level geometry classes, where students use formal logic to compare abstract systems often without concrete model. Students reason formally about mathematical system. The product of their reasoning is establishment, elaboration and comparison of axiomatic systems.

All the above mentioned Van Hiele levels of geometrical thinking can be summarized in the following table.

Table No. 1

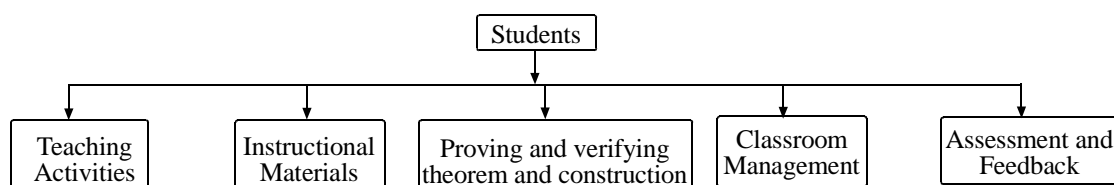
Van Hiele's Levels of Geometric Thinking

Levels	Stages	Characteristics
Level 0	Visualization	Student recognize the figures on the basis of their physical appearance
Level 1	Analysis	Students analyze the component part of figures
Level 2	Information	Students establish the interrelationship of properties both within figures
Level 3	Deduction	Students able to construct proofs using postulates or axioms and definitions
Level 4	Rigor	Students can work in a variety of axiomatic systems

Conceptual Understanding of the Study

The conceptual understanding design by the researcher is to identify the problems faced by students in learning geometrical at Sarlahi district. For the study of related literature above, the researcher made the framework for this study, so the following framework sketch has presented below:

Figure No. 1 : Conceptual Framework



Chapter III

METHODS AND PROCEDURES

This chapter deals about research design, population and sample of the research study, data collection instrument, data collection procedure and analysis and interpretation of collected data. So the research methodology is the important aspect of the study. This study concerned with the study of problems faced by students in learning geometry at secondary level of Sarlahi district.

The major components of procedures are research design, population of the study, sample of the study, research instruments, data collection procedure, scoring procedure and data analysis procedure about which detail explained can be found in this chapter.

Research Design

Descriptive survey method was adopted to conduct the study. The aim was to identify major problems faced by secondary level students in geometry learning.

Population of the Study

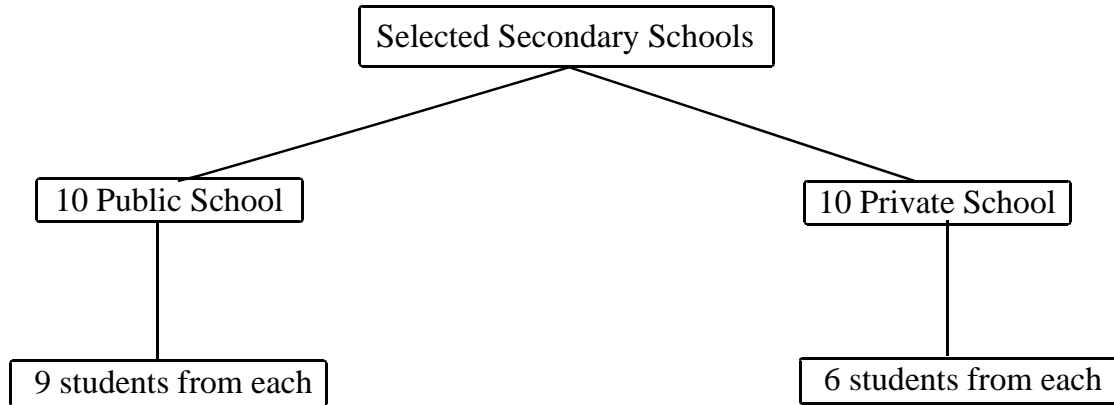
Population is the entire field of concern where the result and findings are generalized. For this research study, the population is all students of Sarlahi district of grade X of academic year “2073 B.S”.

Sample of the Study

According to the record of District Education Office, there are 75 community secondary schools and 30 institutional secondary schools in Sarlahi District. Out of these secondary schools of Sarlahi district; the researcher selected 10 community and 10 institutional schools by stratified random sampling method as a sample. The

researcher selected 9 students from each 10 community school and 6 students from each 10 institutional schools by sample random sampling method.

Detailed Sample Characteristics



Instrument of the Study

To carry out the research, the following data collection instruments were used:

Questionnaire

Questionnaire is regarded as the main tool of this study which was developed by researcher herself with the help of the supervisor. The questionnaire constructed for students consisted of 28 questions concerning about teaching learning activities, instructional materials, evaluation techniques, classroom management and proving and verifying the theorems. The validity of the questionnaire was checked and approved by supervisor. Reliability of questionnaire has been established by administrating the questionnaire into some students which is not sample students and validity has been established through criterion related validity.

Interview

An interview is a conversation where questions are asked and answers are given. In common parlance, the word "interview" refers to a one-on-one conversation with one person to another person. In this research, researcher used structured interview with interview schedule. To explore the cause of problems faced by students in learning

geometry some questions were asked to the students as interview to know their view. Reliability of interview has been established by applying it into same group of students which is not a part of sample and validity has been established through criterion related validity.

Data Collection Procedure

The data had been collected by primary sources. For this purpose, the researcher visited each of the sampled school along with the questionnaire and interview schedule and request letter from T.U. to render any help needed to the researcher from the school administration. After explaining the purpose of the visit the researcher requested each of the students of the schools included in the sample to fill the questionnaire honestly. The researcher explained and clarified the confusions that arose in understanding the statements. Researcher also used interview personally with students and required information were collected for the research study.

Scoring Procedure

For the analysis of the items obtained from questionnaire weightage of 5, 4,3,2,1 is assigned to statement 'strongly agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly disagree' respectively. For the statements opposing to this point of view, the items scored in the opposite order. Mean weightage was calculated. Total score of five point Linkert scale is- 15, thus its average score is 3. If the calculated index is greater than 3, then it is concluded that the statement contains in strong favor to the problems. If the index measure is less than or equal to three then it is weak favor to the problems.

Table No. 2

Likert's 5 points scale scoring procedure

S.N.	Meaning of scale	Positive statements	Negative Statements
1	Strongly agree	5	1
2	Agree	4	2
3	Undecided	3	3
4	Disagree	2	4
5	Strongly disagree	1	5

If the statement is positive, they give their opinion strongly agree then score is 5, In the similar manner agree, undecided, disagree, strongly disagree have scored 4, 3, 2 and 1 respectively.

If the statement is negative, they give their opinion strongly agree, then score is 1, In the similar manner agree; undecided, disagree, strongly disagree have scored 2, 3, 4, 5 respectively.

At last the responses of teachers were categorized in few columns and calculated by percentage. Interview schedule also used to justify the quantitative data that referred the problems.

Data Analysis Procedure

The data were calculated items wise and then area wise in the various problems faced by students related to teaching learning activities school environment in mathematics learning and so on. The collected data were tabulated and analyzed according to the objectives of study. The information received through interview was interpreted to justify to the numerical findings.

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

statistical techniques. Like mean weightage is used to locate the central position of the responses to the statements of students as a whole in the rating scale. The statistical of t-test was applied to find out difference in problems between the community and institutional school students. The differences were tested at the 5% level of significance, i.e. $\alpha=0.05$.

The collected data through questionnaire and interview were analyzed and interpreted with the help of mean weightage, t- test. Obtained Information and data were analyzed and interpreted on the headings; teaching learning activities, instructional materials, evaluation techniques, classroom management and proving and verifying the theorems.

Chapter IV

ANALYSIS AND INTERPRETATION

Data analysis and interpretation is the process of assigning meaning to the collected information and determining the conclusions, significance, and implications of the findings. The steps involved in data analysis are a function of the type of information collected; however, returning to the purpose of the research and the research questions provide a structure for the organization of the data and a focus for the analysis.

The data were collected for the study from twenty secondary schools selected 10 from institutional and 10 from community area schools of Sarlahi district. The collected data were tabulated and analyzed according to objectives of study. The obtained data were statistically analyzed and interpreted by using statistical tools mean weightage, t-test and percentage.

The collected data were analyzed under the following main headings which relates to the conceptual framework and objectives of the study.

-) Problems related to teaching learning activities.
-) Problems related to instructional materials.
-) Problems related to proving and verifying theorems and construction.
-) Problem related to classroom management.

Teaching Learning Activities

Analysis and Interpretation of the Responses on Teaching Learning Activities plays important role to shape knowledge and understanding the subject matter.

Students' performance and perception depend upon how the teacher presents subject matter. Students centered teaching methods are now highly appreciated. The students' responses on teaching learning activities are given below as:

Table No. 3**Students' Responses on Teaching Learning Activities**

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remark
1	The class starts from interesting way	28	33	23	30	36	2.91	prob. *
2	Teacher gives extra parallel problems related with exercise	43	68	12	4	23	3.63	No. prob.
3	Teachers provide opportunity for weak students	15	49	11	32	43	4.19	No. prob.
4	The teacher also participates with you in classroom	53	59	7	19	12	3.82	No. prob.
5	We feel difficult while providing theorem	23	38	14	27	48	2.74	No. prob.
Total							3.46	No. Prob.

From the table presented above, we can see that there is not problem in statement 2, 3 and 4. The mean weightage of statements 2, 3 and 4 are 3.63, 4.19, and 3.82 respectively which are all more than 3. Therefore, it is true to say that teachers are giving extra parallel problems related with exercise; provide opportunity for weak students and they also participates with students in classroom.

Also from the above table, we can see that the mean weightage of statements 1 and 5 are both less than 3 which are 2.74 and 2.91 respectively. Therefore, we can say that there is problem in starting of class and proving, verifying theorem.

To explore the possible cause in facing problem on teaching learning activities, the researcher asked a question to the students. Then students reply as follows:

"Yes, I am feeling mathematics is hard subject' but in secondary level my favorite subject was math. Now a day I don't get sufficient time to practice mathematics so I feel it is hard." (A)

"Yes, I fell geometry is a hard subject because I must engage in household work like carrying water, making foods, cutting grass etc"
.(B)

"Geometry becomes hard subject to me because I use the evening time by playing football, volleyball, caremboard and listening folk song is mobiles as well a watching TV every day as like" (C)

From the above interview response, it can conclude that students feel difficult in learning geometry. Some of the reasons of filling geometry difficulty, lack of interesting way of teaching geometry and difficulty in proving theorems, sufficient time to practice mathematics at learn.

Instructional Materials

To make teaching learning activities effective and meaningful, use of instructional materials are indispensable. Different kinds of teaching materials can be used in teaching geometry such as audiovisual aids, models, textbook and computer and so on. These materials could be used in classroom to facilitate teaching learning situation. Instructional materials are strong weapon to motivate the class. To minimize the geometrical problems all sorts of instructional materials can be adopted. Different teaching tools and materials can be used to make the teaching effective. Table No. 4 shows the situation of problems related with instructional materials.

Table No. 4**Instructional Materials**

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
6	Text books and practice books are available in time	27	84	7	27	5	3.67	No. Prob.
7	Our teacher uses locally available and low cost materials in teaching geometry	27	65	9	4	45	3.16	No. Prob.
8	Manipulative geometrical materials are not available in our school	30	34	4	4	78	3.9	Prob. *
9	Less use of teaching materials	66	52	7	9	16	3.96	Prob.*
10	Teachers use instructional materials while teaching geometry	6	15	5	5	119	1.39	Prob. *
	Total						3.21	No. Prob.

The analysis of Table No. 5 shows that total mean weightage of statements is 3.21 implies that students are facing problems on the field of instructional materials mean weightage of items 10 is 1.39 follows that students agreed only about availability of instructional materials but which are not sufficient for learning geometry. Items numbers 6, 7, 8 and 9 have mean weightage 3.67, 3.16, 3.9 and 3.96 respectively which followed that students were in favor of the problems with availability of text book, uses of locally materials, availability of manipulative materials and less use of teaching materials. Teaching facilities and teaching aids play an important role to improve mathematics education program. Taking this fact into account it could be argued that mathematics laboratory or mathematics resource centre.

The next concern to investigation is to identify the availability and adequacy of materials such as video recorder, micro-computer, overhead projector, calculator, mathematics models, mathematical charts, cardboard, plywood tools and school books in the schools. The only materials available in school were some mathematics charts, models cardboards, plywood tools and some textbook in urban school. As indicated by the, teachers and students, these materials were not adequate. According to the researcher discussion to the head teacher of every sampled school. There was unavailability of materials like video-recorder, micro computer, overhead projector, film projector and photo copier. In order to improve the mathematics education program, finances must be found for keeping teaching materials and aids in the mathematics laboratories and more emphasis should be given to produce and use local teaching materials it has been found that the teachers were unable to make necessary teaching materials due to lack of training and enough time some of them noted that economic aspect is another factor.

Time factor hinder use of instructional materials due to the short time period of mathematics class. Teaching materials had not been used because of large number of class size.

"Teacher does not use materials except geometry box and daily used materials at teaching" (student)

" I feel that Geometry is the hardest topic in mathematics because of my pre-knowledge and teacher does not care us he used to forward lesson according to talent students only" (D)

"Due to my family I can't read and write more I have to engage in other household work, I used to be absent. I can't understand while teaching by teacher in the classroom can't see all the things which are written in the

board. So, I feel mathematics is hard subject. "(E)

"I spend more time arrival and departure because my house is far from school.

Our teacher does not check our homework daily and he also does negligence our creativity and curiosity. Teacher does not review the previous subject matter which are very need to know the geometrical ideas, so day by day I am feeling that Geometry is a hard subject" (F)

The above view of students shows that there is lack of the teaching materials.

"The classroom is so much crowded but the school neglect another section for mathematics" (Students)

There is large number of students in the classroom student feel difficulty for leaning and teacher can not use teaching materials so much this may be lack of teacher.

By analysis and interpreted of responses related to the instructional materials it concluded that there were some problems related to the availability of textbook and other related materials in times, constructing and using of local teaching materials availability of audio and visual aids availability of experienced and 'trained teacher, economic crisis and lack of well management of classroom according to the numbers of students.

Proving and Verifying Theorems and Construction

Teaching theorems is not an easy task at all. It is abstract and challenging task because of its abstract nature. Construction is also appears as a great problems because of less skill of students in manipulating the instruments. Many students face difficulties in proof type geometry problem solving.

The Van Hiele (1957) noticed the difficulties that their students had in learning geometry. His theory explains why many students' encounter . difficulties in their

geometry course especially with formal proofs. Van Hiele believed that writing and that many students need to have more experiences in thinking at lower level before learning formal geometric concepts.

Table No. 5 illustrates the student's responses on problems of proving and verifying theorems and construction.

Table No. 5

Proving and Verifying Theorems and Construction

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
11	Teaching materials are used in teaching theorems and exercises	15	27	24	35	49	2.49	Prob.*
12	Our teacher uses geometrical instruments while teaching construction	6	15	5	5	119	1.56	Prob.*
13	Geometrical theorems of secondary level related with life	25	31	9	36	49	2.65	Prob.*
14	Examples and exercises of theorems are highly correlated	35	67	5	17	25	3.45	No. Prob.
	Total						2.54	Prob.*

Teaching construction and verifying the theorems are less priority in maximum schools. Using -the mean weight age of No. 11, 12 and 13 claims that most of the students are facing problems when proving theorems and construction. And the mean weightage of no. 14 claims that most of the students are satisfy that example and exercise of theorems are highly correlated.

For the justification the above quantitative result researcher did interaction with

the students which is given below:

"Teacher always emphasis their own method and they also choose the lesson according to their will" (students)

"Teacher always emphasis on bookish knowledge and not give many examples for concept in mathematics classroom". (Students)

The above views of students shows that for the selection of method and lesson teacher always dominated the students but the modern view of learning emphasized more collaborative and co-operative method for teaching and learning geometry and students indicated that the mathematics teacher in the classroom did not try to extra mathematics activities such as did not give many examples and did not try to manage extra mathematical activities.

Table No. 6

Students' Responses about Classroom Management

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
15	We feel difficulties while participating in the congested classroom	14	12	5	65	54	2.11	Prob. *
16	Problems of the text books are related to the daily life of students	13	22	16	54	45	2.36	Prob. *
17	We have no any problems of blackboard and other furniture in our classroom	45	53	22	16	19	3.69	No. Prob.
18	We solve our mathematical problems in group	37	21	12	47	33	2.88	Prob. *
19	Anything written in blackboard is visible	57	54	2	11	26	3.70	No. Prob.
	Total						2.95	Prob. *

However, during the research period it had been found that students were disagreed about the classroom management in teaching geometry mean weightage of item 17 and 19 has 3.69 and 3.70 which follows that students agreed only about the blackboard and furniture of the classroom and visible in blackboard -but which are not sufficient for learning geometry. Item number 15, 16 and 18 have mean weightage 2.11, 2.36 and 2.88 respectively which follows that students are in favor of the problems with congested classroom, group work activities and text book are related to daily life. The total mean of the statement is 2.95 which show that most of schools have problems in classroom management because of the overload of students in government schools.

To explore the possible cause in facing problem on teaching learning activities, the researcher asked a question to the students. Then students reply as follows:

Students view "*When teacher teaches to us in the class he does not give us the clear concepts about the topic so that feel difficulty in solving the exercises' problems. He does not use the teaching materials and unit test in the classroom*".

From the above responses of the related respondents questionnaire, it concluded that there were problems related to classroom management especially in classroom participation due to the congested classroom and lack of group discussion in the classroom. Also from student's view we conclude that there is lack of teaching materials in classroom and demonstration place which cause hinder in learning geometry.

Table No. 7**Students Responses on Assessment and Feedback**

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
20	The teacher checks our home work daily.	48	60	14	5	23	3.70	No Prob.
21	The teacher take the test at the end of each unit	15	31	3	24	77	2.22	Prob. *
22	Our teachers takes different types of rest except terminal exam	19	40	10	14	67	2.53	Prob. *
23	Teaching is only exam oriented	19	32	5	70	24	2.68	Prob. *
24	The teachers focus on our creativity and curiosity	28	38	10	34	40	2.87	Prob. *
25	Contents in the given text book are related to lower classes	47	49	7	25	22	3.49	No. Prob.
26	Teachers give the feedback	24	37	2	33	54	2.65	Prob. *
27	All geometrical problems included in exam	3	13	6	58	70	2.31	Prob. *
28	The first priority is not given to teach geometry	55	59	4	28	4	2.07	Prob. *
	Total						2.72	Prob. *

The total mean weightage 2.72 indicates the most students are in favor of the problems of evaluation techniques. During research and analysis of Table No.9, It had

been found that most of students especially in items 21, 22, 23 ,24, 26, 27 and 28 with mean weight age 2.22, 2.53, 2.68, 2.87, 2.65, 2.31 and 2.07respectively are in favor of the problems. The items 20 and 25 with mean weightage 3.70 and 3.49 respectively are not favor of the problems of evaluation techniques. Students agreed about the unit tests, terminal tests, problems included in exam of geometry and given priority in teaching geometry.

Many students claimed that there is not a connection between the classroom evaluation and final evaluation of the students. It indicates that the poor students could also pass the final evaluation by cheating and defective promoted policy.

"I am feeling mathematics as interesting and easy subject among all other subject because if we know the process and formula we can solve the problems easily" (G)

"I also feel geometry as an interesting and easy subject. But some time if teacher does not give clear concept in proving and veribiing the .geometry theorems then I used to feel lazy" (H)

"Yes, for me geometry is the hardest subject. I will not take mathematics after S.L.C. because of my economic condition I can't read tuition class, I don't get sufficient materials, and our classroom also very congested. I have to sit backside always and friends are talking much more. So I don't understand mathematics. '(I)

"Yes, I am feeling geometry is hard subject because in the class our teacher never uses the teaching materials and he always uses the lecture method. He also follows the summative evaluation system and he is unknown about the using and constructing the local teacher materials."

(J)

Study other problems related to assessment and feedback are as follows:

-) Yearly and half-yearly tests are not reliable due to cheating problems.
-) Record keeping evaluation system is tiresome job.
-) Poor students copy the homework of talents.
-) Weak students also pass the class and place new corners in class due to the defective promoted policy.
-) No use of any other evaluation tools except paper pencil test exam.
-) The evaluation of classroom activities is not included into terminal examination.

In conclusion, various problems have appeared in evaluation system of mathematics learning.

Lack of involvement in curriculum planning, lack of efficiency to conduct with their teachers such as shy, hesitation produces, lack of books and journals and teaching facilities, lack of opportunities given to upgrade their knowledge, poor family environment in terms of financial and social prestige in society, involvement in their household work as child labor and various capacities.

In teaching learning mathematics there are no remarkable training opportunities for skill development to teacher as well as students which could help with teaching. Radio, television and mobiles play a mostly negative role in students. They spend time by watching serials and listening music while they have a little time saving from household works.

Long distance corners spend their valuable time to arrival - and departure and at that time they spend it by joking, singing and love affairs which are hot related to study.

Comparison of Problems Faced by institutional and community School Students For the sake of easiness, paired, sample t-test was applied to compare the

problems faced by institutional and community school students are shown in the following table No. 8.

Table No. 8

Comparison of Problems Faced by institutional and community School Students

Group compared	Mean	S.D.	Number of students	df	Calculated value	Tabulated value
Institutional students	$X_1 = 83.93$	$S_1 = 6.14$	$n_1 = 60$	148	-0.296	1.645
Community students	$X_2 = 81.86$	$S_2 = 44.07$	$n_2 = 90$			

From the analysis of Table No. 8 shows that the tabulated value of t at 5% level of significance and 148 degree of freedom is $t_{0.05, 148} = 1.645$.

It has shown that calculated value of institutional and community students is -0.296 at 5% level of significance and 148 degree of freedom. Where as tabulated value given at the same degree of freedom and level of significance is 1.645. It shows that tabulated value exceeds calculated value for two tailed test so the value falls on acceptance regions. Thus, null hypothesis is concluded that there is no difference between the problems faced by institutional and community students. For the statistical formula it is concerned in Appendix-H.

Chapter-V

SUMMARY, FINDING CONCLUSION AND RECOMMENDATIONS

This chapter deals with the summary, major finding, conclusion and recommendations.

Summary

The main purpose of the study was to identify the problems faced by the students in learning geometry at secondary level of Sarlahi district.

The specific objectives of the study were

-) To find the problems faced by the students in learning geometry at secondary level.
-) To examine whether there is significance difference between problems faced by community and institutional school students in learning geometry.

This study was entirely survey type. The population of this study consisted of entire mathematics students of both institutional and community of Sarlahi district. The researcher herself developed the questionnaire and interview schedule under the guidance of supervisor and researcher added some problems herself with advice of experienced mathematics teacher. The questionnaire and interview schedule were tools of study. The responses were collected from different students selected from simple random sampling method. The collected data were quantified based on Likert five point scales. Questionnaire and interview schedule were included in each category of problems and descriptive analysis of collected responses were carried out. Statistical indicators such as mean weightage, t-test and percentage were used for analysis of problems.

Findings

From the field survey and statistical analysis of the collected data it was found that students have been facing numerous problems in Geometry learning at secondary level.

Major findings of this research study are as follow:

-) The problems in learning geometry at secondary level founded that lack of instructional materials, congested classroom and lack of appropriate feedback.
-) The causes of problems in learning geometry founded from interview are spending more time on household work, playing, distance between home and school, negligence by teacher to poor students, teaching without providing clear concepts.
-) The problems faced by institutional and community students in learning geometry at secondary level are not significantly different.

Conclusion

Form the above stated findings of this study, it can be concluded that

-) Teaching and learning of geometry was not satisfactory in Sarlahi district. It consists some major problems and need to solve it.
-) There had been significant problems in teaching learning activities, instructional materials, theorems and construction, classroom management and evaluation technique in both community and institutional schools.

Recommendation for Further Study

This present study may not be completed for all situation Further researchers can apply the different tools and methods related to the some problems. For this, the researcher has presented the following recommendations for further studies.

-) Similar study should be carried out with a large sample and various schools of different parts of Nepal.
-) This kind of studies should also be conducted at all levels of schools and in other subjects as well.
-) The similar study should be done in other districts of Nepal as well.
-) The District Education Office should manage the inter resource centre visiting and observing the mathematical classes and also should play vital role of organizing the inter district level mathematical conferences.
-) The teacher shouldn't make students only busy copy the solved problems from the blackboard check them whether they are comprehending or not.
-) The classroom should be well arranged that the students can equality and easily participate in the classroom activities.
-) The school administration should interact to the students, teachers, guardians and other related persons to discuss the problems and come to the solution.
-) Innovative and refreshment training, orientation and supervision should be provided to the teacher time to time.

BIBLIOGRAPHY

- Attreya, R. P. (2006). *A study of problem faced by mathematics teachers to maintain positive discipline in secondary level classroom*. An unpublished Master's Thesis, Department of Mathematics . Education T.U.
- Baral, S. K.. (2000). *A study of the problem faced by mathematics teachers in implementation of compulsory mathematics in Grade IX*. Unpublished Thesis, Central Department of Mathematics Education, T.U.
- Basnet, B.B. (2003). *Teaching problems faced by mathematics Teachers in existing curriculum of Grade VIII*. Unpublished Master's Dissertation, Department of Mathematics Education, T.U. Nepal.
- Basnet, D. B. (2003). *Teaching problems faced by the mathematics teachers in existing curriculum of grade eight: An unpublished Thesis*, Central Department of Mathematics Education, T.U.
- Bell, H. (1978). *Teaching and learning Mathematics*. USA: W.M.C., Brown company Published.
- Best, J.W. and Kahn, J. V. (1999). *Research in Education (7th Ed)*. New Delhi, Prentice Hall-of India.
- Bhattarai, T. (2005). *A study of problems faced by the secondary level mathematics students in Existing curriculum*. An unpublished Master's Thesis, Department of Mathematics Education, T.U.
- Bhattarai, T. (2005). *A study of problems faced by the mathematics students in existing curriculum*. An unpublished thesis, Central Department of Mathematics Education, T.U. -
- Bist, R. K. (2009). *A study on problems faced by secondary school mathematics teacher in teaching Mathematics*. An unpublished Thesis, Central Department of

Mathematics Education, T.U.

Butler, C. H. Wren F. C. & Banks, J. H. (1970). *The Teaching of Secondary school Mathematics*. New York: Mc Graw-Hill. Chaulagain, R. (2005). *A study of problems faced by secondary school mathematics teacher in teaching Geometry*. An unpublished Master's Thesis, Department of Mathematics Education, T.U.

Glasser, G. (1986). *The crisis of Geometry Teaching Studies in Mathematics Education* (Geometry in schools) UNESCO Volumes.

KC, N. (2009). *A study of problems faced by students in compulsory mathematics at secondary level*. An unpublished Master's Thesis, Department of Mathematics Education T.U.

Kelly, J. & Ladd, E. (1986). *Fundamental Mathematical structures of Geometry*. New Delhi Eurasia Publishing House Pvt. Ltd, Ramnager.

Lathichhane, 1-1 (2001). *A study of problems faced by the secondary level mathematics Teachers in Teaching mathematics*. An unpublished Master's Thesis, Department of Mathematics Education, T.U.

Maharjan, H. B., Upadhaya, H. N. & Paudel L. N. (2056). *Teaching Mathematics in Secondary School, Kathmandu*. Ratna Pustak Bhandar Bhotahiti.

Ministry of Education (1971). *National Education System Plan for 197176*. Kathmandu: MOES.

Ministry of Education (2057). *Secondary School curriculum*. Bhaktapur: Curriculum Development Centre.

NCED, (2005). *Teacher Education Volume III, Number I*. Sanothimi, Bhaktapur.

Pandit, R. P. (2001), *A study of problems faced by the mathematics Learning Teacher Educators in the implementation of three years B.Ed. level Mathematics*

curriculum in Nepal. An Education and Development, CERID.

Pandit, R. P. (2054). *Teaching mathematics, Kathmandu Nepal.* Ananta Prakashan.

Pathak, B. P. (1987). *A study on the problems faced by the teacher of Kathmandu District in the implementation of mathematics curriculum for lower secondary level.* An unpublished Thesis, Central Department of Mathematics Education; T.U.

Paudel, D. P. (2007). *A study on problem faced by lower secondary school Mathematic Teachers in teaching Geometry.* An. unpublished Master's Thesis, Department of Mathematics Education, T.U.

Sapkota, P. P. (2008). *Problems faced by students in Mathematics Learning and its impact in the examination.* An unpublished Master's Thesis, Department of Mathematics Education T.U.

Sha, P. P. (2004). *A study of the Achievements of the pupil in the unit transformation Geometry at secondary school in Parsa District.* An unpublished Master's Thesis, Department of Mathematics Education, T.L.

Shrestha, M. B. (1991). *A study of sex in achievement in mathematics of Ninth grade students in Gorkha District.* Unpublished Master's Dissertation, Department of Mathematics Education, T.U. Nepal.

UNESCO (1992). *The Educational Administrator and instructional materials.*

Upadhayay, H. P. (2004). *Teaching Mathematics.* Kathmandu, Ratna Pustak Bhandar.

Vance, E. L. (1973). *The content of Elementary School Geometry programme.* The Arithmetic Teachers, Volume 20, N.6. USA: An official Journal of NCTM.

Appendix A
Questionnaire

Dear Students

I am a master's degree student of Mathematic Education, Central Department of Education, Kirtipur, Kathmandu. I am writing a thesis entitled on "Problem Faced by Students at Geometry in Secondary Level" for partial fulfillment of master degree in education. Teaching learning activities couldn't be effective without indentifying the actual problems of students in teaching. So, to complete this thesis, I have prepared some questionnaires for you. Research is very much thankful for your valuable help and would like to express gratitude to you and your intuition. The information obtained from you will be used for this study and your answers will be kept secret.

Researcher

Lasang Lama

Department of Mathematics Education

Appendix B

Questionnaire for students

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remark
1	The class starts from interesting way	28	33	23	30	36	2.91	prob.
2	Teacher gives extra parallel problems related with exercise	43	68	12	4	23	3.63	No. prob.
3	Teachers provide opportunity for weak students	15	49	11	32	43	4.19	No. prob.
4	The teacher also participates with you in classroom	53	59	7	19	12	3.82	No. prob.
5	We do not feel difficult while providing theorem	23	38	14	27	48	2.74	prob.
Total							3.46	

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
6	Text books and practice books are available in time	27	84	7	27	5	3.67	No. Prob.
7	Our teacher uses locally available and low cost materials in teaching geometry	27	65	9	4	45	3.16	No. Prob.
8	Manipulative	30	34	4	4	78	3.9	Prob.

	geometrical materials are not available in our school							
9	Less use of teaching materials	66	52	7	9	16	3.96	Prob.
10	Teachers use instructional materials while teaching geometry	6	15	5	5	119	1.39	Prob.
	Total						3.21	No. Prob.

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
11	Teaching materials are used in teaching theorems and exercises	34	56	4	7	49	3.12	No. Prob.
12	Our teacher uses geometrical instruments while teaching construction	6	15	5	5	119	4.13	No Prob.
13	Geometrical theorems of secondary level related with life	45	90	4	11		4.13	No Prob.
14	Examples and exercises of theorems are highly correlated	41	87	5	17		1.08	Prob.
	Total						3.85	Favorable

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
15	We feel difficulties while participating in the congested classroom	34	65	5	12	34	3.35	Prob.
16	Problems of the text books are not related to the daily life of students	15	49	11	32	43	3.26	Prob.
17	We have no any problems of blackboard and other furniture in our classroom	70	53	2	11	14	1.56	No. Prob.
18	We solve our mathematical problems in group	33	47	12	21	37	3.12	No Prob.
19	Anything written in blackboard is visible	77	59	2	6	6	4.3	No Prob.
	Total						3.11	No Prob.

S.N.	Statements	SA	A	U	DA	SDA	NW	Remark
20	The teacher checks our home work daily.	48	90	4	5	3	4.16	No Prob.
21	The teacher does not take the test at the end of each unit	15	31	3	24	77	3.94	Favorable
22	Our teachers takes different types of rest except terminal exam	19	40	10	14	67	2.53	Less Favorable
23	Teaching is only exam oriented	24	70	5	32	19	3.32	Favorable
24	The teachers do not focus on our creativity and curiosity	28	48	10	24	40	3.00	Favorable
25	Contents in the given text book are related to lower classes	57	79	7	5	2	4.37	Favorable
26	Teachers give the feedback	44	57	2	13	34	3.08	Favorable
27	All geometrical problems aren't included in exam	70	58	6	13	3	2.57	Less Favorable
28	The first priority is not given to teach geometry	55	59	4	28	4	2.07	Less Favorable
	Total						3.03	Favorable

Appendix- C

Response score of community students in questionnaire

S.N.	Statements	SA	A	U	DA	SDA	Total
1.	The class starts from interesting way	70	92	57	40	14	273
2	Teacher gives extra parallel problems related with exercise	125	180	12	6	13	336
3	Teachers provide opportunity for weak students	55	116	21	40	23	255
4	The teacher also participates with you in classroom	150	156	12	20	7	345
5	We do not feel difficult while providing theorem	70	80	27	34	30	251
6	Text books and practice books are available in time	85	200	24	20	5	334
7	Our teacher uses locally available and low cost materials in teaching geometry	85	180	15	6	20	306
8	Manipulative geometrical materials are not available in our school	100	80	9	4	45	238
9	Less use of teaching materials	180	128	12	16	10	346
10	Teachers use instructional materials while teaching geometry	5	40	9	6	73	133
11	Teaching materials are used in teaching theorems and exercises	40	60	42	40	33	215
12	Our teacher uses geometrical instruments while teaching	15	40	9	6	71	141

	construction						
13	Geometrical theorems of secondary level related with life	75	80	15	40	30	240
14	Examples and exercises of theorems are highly correlated	100	148	12	22	18	300
15	We feel difficulties while participating in the congested classroom	40	28	9	80	32	189
16	Problems of the text books are not related to the daily life of students	30	48	33	64	29	304
17	We have no any problems of blackboard and other furniture in our classroom	140	116	42	22	13	333
18	We solve our mathematical problems in group	115	52	21	52	21	261
19	Anything written in blackboard is visible	165	140	6	12	14	337
20	The teacher checks our home work daily.	140	136	24	8	16	324
21	The teacher does not take the test at the end of each unit	60	60	-	34	46	200
22	Our teachers takes different types of rest except terminal exam	50	68	27	20	44	209
23	Teaching is only exam oriented	60	60	15	80	18	233
24	The teachers do not focus on our	70	80	9	56	25	240

	creativity and curiosity						
25	Contents in the given text book are related to lower classes	135	112	18	34	12	311
26	Teachers give the feedback	40	100	-	38	38	216
27	All geometrical problems aren't included in exam	-	28	6	88	37	159
28	The first priority is not given to teach geometry	175	112	3	44	4	338

Appendix- D

Number of respondent in the questionnaire of community school students

S.N.	Statements	SA	A	U	DA	SDA	Total
1.	The class starts from interesting way	14	23	19	20	14	90
2	Teacher gives extra parallel problems related with exercise	25	45	4	3	13	90
3	Teachers provide opportunity for weak students	11	29	7	20	23	90
4	The teacher also participates with you in classroom	30	39	4	10	7	90
5	We do not feel difficult while providing theorem	14	20	9	17	30	90
6	Text books and practice books are available in time	17	50	8	10	5	90
7	Our teacher uses locally available and low cost materials in teaching geometry	17	45	5	3	20	90
8	Manipulative geometrical materials are not available in our school	20	20	3	2	45	90
9	Less use of teaching materials	36	32	4	8	10	90
10	Teachers use instructional materials while teaching geometry	1	10	3	3	73	90
11	Teaching materials are used in teaching theorems and exercises	8	15	14	20	33	90
12	Our teacher uses geometrical instruments while teaching	3	10	3	3	71	90

	construction						
13	Geometrical theorems of secondary level related with life	15	20	5	20	30	90
14	Examples and exercises of theorems are highly correlated	20	37	4	11	18	90
15	We feel difficulties while participating in the congested classroom	8	7	3	40	32	90
16	Problems of the text books are not related to the daily life of students	6	12	11	32	29	90
17	We have no any problems of blackboard and other furniture in our classroom	28	29	14	11	13	90
18	We solve our mathematical problems in group	23	13	7	26	21	90
19	Anything written in blackboard is visible	33	35	2	6	14	90
20	The teacher checks our home work daily.	28	34	8	4	16	90
21	The teacher does not take the test at the end of each unit	12	15	-	17	46	90
22	Our teachers takes different types of rest except terminal exam	10	17	9	10	44	90
23	Teaching is only exam oriented	12	15	5	40	18	90
24	The teachers do not focus on our	14	20	3	28	25	90

	creativity and curiosity						
25	Contents in the given text book are related to lower classes	27	28	6	17	12	90
26	Teachers give the feedback	8	25	-	19	38	90
27	All geometrical problems aren't included in exam	-	7	2	44	37	90
28	The first priority is not given to teach geometry	35	28	1	22	4	90

Appendix- E

Response score of institutional students in questionnaire

S.N.	Statements	SA	A	U	DA	SDA	Total
1	The class starts from interesting way	70	40	12	20	22	164
2	Teacher gives extra parallel problems related with exercise	90	80	15	10	12	207
3	Teachers provide opportunity for weak students	30	80	12	20	20	162
4	The teacher also participates with you in classroom	110	80	12	18	5	225
5	We do not feel difficult while providing theorem	65	72	9	20	16	182
6	Text books and practice books are available in time	50	140	6	20	3	219
7	Our teacher uses locally available and low cost materials in teaching geometry	50	80	12	2	25	169
8	Manipulative geometrical materials are not available in our school	85	40	3	4	30	162
9	Less use of teaching materials	150	80	9	2	6	247
10	Teachers use instructional materials while teaching geometry	25	20	6	4	46	101
11	Teaching materials are used in teaching theorems and exercises	35	48	30	30	16	159
12	Our teacher uses geometrical	15	20	6	4	48	93

	instruments while teaching construction						
13	Geometrical theorems of secondary level related with life	75	56	15	32	10	188
14	Examples and exercises of theorems are highly correlated	75	120	3	12	8	218
15	We feel difficulties while participating in the congested classroom	30	20	6	50	22	128
16	Problems of the text books are not related to the daily life of students	35	40	15	44	16	150
17	We have no any problems of blackboard and other furniture in our classroom	85	96	24	10	6	221
18	We solve our mathematical problems in group	70	32	15	42	12	171
19	Anything written in blackboard is visible	120	76	-	10	12	218
20	The teacher checks our home work daily.	100	104	18	2	7	231
21	The teacher does not take the test at the end of each unit	15	64	15	14	31	139
22	Our teachers takes different types of rest except terminal exam	45	92	3	8	23	171
23	Teaching is only exam oriented	35	68	-	60	6	169

24	The teachers do not focus on our creativity and curiosity	70	72	21	12	15	190
25	Contents in the given text book are related to lower classes	100	84	3	16	10	213
26	Teachers give the feedback	80	48	6	28	16	178
27	All geometrical problems aren't included in exam	15	32	12	24	33	116
28	The first priority is not given to teach geometry	100	124	9	12	-	245

Appendix- F

Number of respondent in the questionnaire of community school students

S.N.	Statements	SA	A	U	DA	SDA	Total
1	The class starts from interesting way	14	10	4	10	22	60
2	Teacher gives extra parallel problems related with exercise	18	20	5	5	12	60
3	Teachers provide opportunity for weak students	6	20	4	10	20	60
4	The teacher also participates with you in classroom	22	20	4	9	5	60
5	We do not feel difficult while providing theorem	13	18	3	10	16	60
6	Text books and practice books are available in time	10	35	2	10	3	60
7	Our teacher uses locally available and low cost materials in teaching geometry	10	20	4	1	25	60
8	Manipulative geometrical materials are not available in our school	17	10	1	2	30	60
9	Less use of teaching materials	30	20	3	1	6	60
10	Teachers use instructional materials while teaching geometry	5	5	2	2	46	60
11	Teaching materials are used in teaching theorems and exercises	7	12	10	15	16	60
12	Our teacher uses geometrical instruments while teaching construction	3	5	2	2	48	60

13	Geometrical theorems of secondary level related with life	15	14	5	16	10	60
14	Examples and exercises of theorems are highly correlated	15	30	1	6	8	60
15	We feel difficulties while participating in the congested classroom	8	7	3	40	32	60
16	Problems of the text books are not related to the daily life of students	7	10	5	22	16	60
17	We have no any problems of blackboard and other furniture in our classroom	17	34	8	5	6	60
18	We solve our mathematical problems in group	14	8	5	21	12	60
19	Anything written in blackboard is visible	24	19	-	5	12	60
20	The teacher checks our home work daily.	20	26	6	1	7	60
21	The teacher does not take the test at the end of each unit	3	16	3	7	31	60
22	Our teachers takes different types of rest except terminal exam	9	23	1	4	23	60
23	Teaching is only exam oriented	7	17	-	30	6	60
24	The teachers do not focus on our creativity and curiosity	14	18	7	6	15	60

25	Contents in the given text book are related to lower classes	20	21	1	8	10	60
26	Teachers give the feedback	16	12	2	14	16	60
27	All geometrical problems aren't included in exam	3	8	4	12	33	60
28	The first priority is not given to teach geometry	20	31	3	6	-	60

Appendix H

Statistical Formula

$$t X \frac{\bar{x}_1 Z \bar{x}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

\bar{x}_1 = Mean of the first sample

\bar{x}_2 = Mean of the second sample

S_1 = Standard Deviation of first sample

S_2 = Standard Deviation of second sample

N_1 = Number of the first sample

N_2 = Number of the second sample