Letter of Certificate

This is the certify that Ms. Babita Silwal student of academic year 2071/72 with Campus Roll Number 224/2071, Thesis Number 1366, Exam Roll Number 28710261/ 2071, and T.U Registration Number 9-2-375-79-2009, has completed her thesis under the rules and regulations of Tribhuvan University , Nepal. The thesis entitled "Problems Faced by Students in Learning Geometry" has been prepared based on the results of her investigation conducted during the period 2020 Feb/Mar. I hereby, recommend and forward that her thesis be submitted for the evaluation as the partial requirement to award the degree of Master's in Education.

.....

Prof. Dr. Bed Raj Acharya

12 February, 2020 (Head)

Letter of Approval

A

Thesis

Submitted

By

Babita Silwal

Entitled:

"**Problems Faced by Students in Learning Geometry**" has been approved in partial fulfillment of the requirement for the degree of Masters of Education.

Committee for the viva-voce	Signature
1. Prof. Dr. Bed Raj Acharya	…….
(Chairman)	.
2. Prof. Uma Nath Pandey	……
(External)	
3. Mr. Abatar Subedi	…….
(Member)	

Date: 6 March, 2020

23 Falgun, 2076

Recommendation for Acceptance

This is to certify that Ms. Babita Silwal has completed her M.Ed thesis entitled "**Problems Faced by Students in Learning Geometry**" under my supervision during the period prescribed by the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu Nepal. I recommend and forward her thesis to the Department of Mathematics Education to organize final viva-voice

……..

Mr. Abatar Subedi

Supervisor

2020

Defensed Date: 6 March, 2020

Dedication

Dedicated

To

My parents and all my family members whose blessings is with me forever.

Declaration

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

…….

6 March, 2020 Babita Silwal

Acknowledgement

I am heavily indebted to my respected supervisor Mr. Abatar Subedi, Department of Mathematics Education, Central Department of Education. T. U. Kirtipur, Kathmandu. I am grateful to him for his scholarly guidance any co-operation on various issues emerged during my inquiry in the field work and writing Phase of study. At the same time, I am very thankful to my respected teachers Prof. Dr. Bed Raj Acharya, head Department of Mathematics Education, T. U. Kirtipur for his valuable suggestions that led me to carry out this research work successfully. I would like to express all the teacher of Department of Mathematics Education, for their respective encouragement in carrying out this research work.

My special thanks are due to the students, mathematics teachers who helped me by giving kind co-operation during my research in the field. I am also equally indebted to Mr. Hari Prasad Silwal for language editing and Raja Ram Sir for computer typing the content.

……...

Babita Silwal

Abstract

This study is aimed to explore the problems faced by students in learning geometry at secondary level and to compare the problems in community and institutional schools. Sixteen schools of Dhading district were selected in sample by stratified random sampling method. Among them 10 schools were community and 6 schools were institutional. Twelve students from each community school and five students from each institutional schools were selected as sample and comprise 150 students in total. The design of the research was descriptive survey. The instruments used in the study were one set of questionnaire to identify the problems faced by the students in learning geometry and one set of interview schedule to explore the causes of problems. The collected data through the use of instruments were tabulated, interpreted and analyzed with percentage, mean weightage and t-test.

The analysis of data indicates that there are problems in learning geometry especially in teaching learning activities, instructional materials, proving and verifying theorems, assessment and feedback system. The causes of these problems, such as lack of encouragement for study, congested and uncomfortable classroom for unavailability of teaching learning materials and lack of trained teachers of students in learning geometry. And compare the problems in community and institutional schools, calculated value is less than tabulated value. So that the hypothesis was rejected. Finally, it is concluded that the students are facing common problems in learning geometry in both type of schools.

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Abbreviations

BC	Before Christ
CDC	Curriculum Development Centre
CERID	Research Centre for Education Innovation and Development
MALATI	Mathematics Learning and Teaching Initiatives
NCTM	National Council of Teacher of Mathematics
SN	Statement Number
SD	Standard Deviation
df	Degree of Freedom
NR	Number of Respondent

Chapter I

Introduction

Background of the Study

Mathematics is the common and worldwide discipline. Mathematics is everywhere and in everything. The term 'Mathematics' means 'many things to many people.' It is closely related to everybody in everyday life and hence it demands for interaction for its high achievement. The use of Mathematics has been a major part of human activities from the beginning of human existence in this earth. In this connection, Roger Becon (294) says, "Mathematics is the gateway and key to all sciences." It means that mathematics plays a vital role for the development of science and technology. It enables us to solve daily life problems. It is a developmental discipline that cultivates the habit of concentration and self-reliance. It prepares for services such as keeping account. Mathematics teaching, auditing engineering, reasoning and so on. So, we take mathematics as a way of thinking as well as means of communication. Mathematics helps people understand and interpret quantitative as well as qualitative aspect of natural phenomena related to human activities (Pandit, 2007). Therefore, interaction is an essential aspect for learning mathematics.

Mathematics is a study of pattern. It is through mathematical description that regularities 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.

Since Vedic Period, Mathematics is taken as a component of education system. It is used in different way in Vedas "The Ancient Holy Book of Hindus." Mathematics is used frequently in other disciplines such as Engineering, Politics,

Economics, Physics, Chemistry, Biology, etc. So, mathematics is essential to understand other subjects or other disciplines in the absence of mathematical knowledge and skills.

Geometry, derived from ancient Greek word 'geo' means earth and matron means measurement, is a branch of mathematics which concerned with the questions of shape and size of the objects. The meaning of Geometry is to measure the earth. It is an ancient branch of mathematics. Its modern meaning depends largely on context. To the high school students, Geometry has two flavors: synthetic and analytic. Synthetic Geometry uses deductive prove to study the properties of points, lines, angles, triangles, circles and other plane figures roughly following the plan laid out by Greek Mathematician Euclid around 3000 B.C. Analytic Geometry follows the pioneering work of French Mathematician Rene Descartes (1596-1665) to impose a coordinate grid on the plane, making it possible to study geometric objects (e.g. lines, parabola and circle) by means of Algebra (e.g. linear equation and quadratic equations and vice versa) (Butter and Wren, 1941).

Basic Geometry is a very powerful practical problem solver. It was used by the ancient Egyptians and Greeks for solving most problems and way the proto-type for rational thinking where we use Algebra today the Greeks used geometry then. It is still very current in all the building and fabrication trades. Before building something big and expensive, it is better to work out the bugs in a small scale model. Before expending a lot of energy in making a model, it is good to do a drawing. It becomes very accurate and can be used to predict measurement and costs. Geometry can be easy to master; the proofs and more fun than Sudoko; and its applications are as practical as a hammer and saw. It gives us a sophisticated visual intuition and a strong sense of rational proof and a jumping of place for some of the most abstract area of

pure mathematics. It is hard to imagine any mathematical education without Geometry.

We should not limit Geometry only to the study of flat surface (plane geometry) and rigid three dimensional objects (solid geometry), but also most abstract thoughts and images might be represented and developed in geometric terms. There are various branches of Geometry.

The specific branches of geometry are Euclidian Geometry, Analytic Geometry, Projective Geometry, Differential Geometry and Topology. The origin of Geometry goes back to approximately 3000 BC in ancient Egypt. Ancient Egyptians used an early stage of geometry in several ways including the surveying of land, construction of pyramids and study of Astronomy. Around 2900BC, ancient Egyptians began using their knowledge to construct pyramids with four triangular faces and a square base. Euclid is known as the father of Geometry. Plato had written above the entrance to his academy that let no one ignorant of geometry entre my door.

Geometry is one of the most important branches of mathematics. It includes different range of ideas. It is related to many other subjects and different views of human activities. Geometry gives basic idea to the mathematical system (Killy and Ladd, 1986).

In school, mathematics is kept as the compulsory subject from the beginning level of schooling. The man purpose of geometry in school level is to develop understanding in geometric figures. Developing special reasoning, problem solving skill and communication skill is the fundamental need for mathematical activity.

Geometry is regarded as one of the core content in school curriculum. From kindergarten through school, geometry is a natural vehicle for developing intuition

creativity and a sprit an inquiry. Geometry is fertile source of interesting and challenging problems and geometrical methods are powerful tools in problem solving.

To secure high percentage /grade in secondary level Mathematics is taken as n important matter. In Mathematics, Geometry covers 24 percent marks in secondary level. So, students should learn Geometry frequently, but due to the lack of motivation teaching-learning. Door classroom practices and management, and other various factors are responsible for creating difficulties in learning Geometry. Such situations affect the efficiency and potentially of students performance in Geometry.

Classroom is the major place to implement the curriculum and teacher is the main agent to implement it. There are various researchers about the problem of students and teachers. But the satisfactory result was not found. What is the actual problem of learning geometry is the main focus of this study. The main problems faced by teacher and students of Mathematics are found in teaching learning activities, physical facilities, classroom management, instructional materials and way of handling it, pre-knowledge and background of the pupil, economic factor and evaluation system.

Most of our school teachers are used chalk and talk method of teaching, but modern time is for demonstration, project work, learning by doing, inspiration and so on. We can use different models to teach students such as cube, square, graph paper, magazines, film slide show, tape recorder, computer program, projector etc. Mathematics teacher should teach the students using low cost and no costing teaching materials. Due to the economic condition we cannot buy readymade teaching materials. The crowded classroom, unavailability of computer, lights, sufficient physical facilities, collection of low cost, no cost materials plays a vital role for learning geometry.

Statement of the Problem

The study concerned with the problem faced by students in learning geometry at secondary level. Both students and teachers face several difficulties in teaching and learning geometry. Most of the students from Nepali schools fail in mathematics in S.L.C. examination. Geometry is integral component of mathematics with containing more verbal and abstractive problems related to triangle, quadrilateral, similarity and congruence of triangle which are directly related to our daily life problems and further study. Geometry is an essential branch of mathematics in primary level upto higher level. Generally the teachers teach geometry at the last hour when it is the time for the students to build up the mind for the exam preparation. They don't understand the teacher's expectation as it is difficult to memorize the theorem. They feel it boring. The students may lack the basic knowledge of geometry which detoriates their curiosity. Ultimately most of the students fail in mathematics due to the geometrical portion. The major cause behind leaving school and failing in this subject is due to the poor performance in mathematics. In mathematics geometry is the subject which is responsible behind failure and low performance of the students. According to the school teacher's most of the student can't even obtain the pass mark in the S.L.C. examination. They thought geometry is the boring and part chapter of mathematics subject. So, it is well appropriate to study faced by students in learning geometry at secondary level.

Therefore, it is relevant to conduct a research on problem faced by students in learning geometry at secondary level. This study should answer the following research questions.

- What are the problems faced by students in learning geometry the secondary level?

- Do the problems faced by the students in institutional school differ from community school in learning geometry?

Justification

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 student's progress in this subject. Most of the teachers and students take geometry as difficult and abstract subject. Most of the teacher 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 mistake 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. Problem 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 on 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 mathematics curriculum in the present context and may be ground for the further researcher in this issues.

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 follows:

- To find the problems faced by the students in learning geometry.
- To compare the 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.
- This study was conducted in Dhading 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.

Operational Definition of Related Terms

Some terms related to this study were defined and explain in the following paragraph with the help of literature review and objective of this study.

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 things which is difficult to deal with or to understand during learning mathematics. These statements

which have solutions 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 a 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 teachers who has faced problems regarding the problem of mathematics curriculum teaching method and evaluation techniques. Then he conclude that the problems regarding evaluation was that most serious problem to the lower secondary level mathematics teachers.

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 weightage 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, lake of instructional materials, teacher 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.

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 so on.

Acharya (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, student's 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 teacher gap between students-teachers-parents are also some problems crate factors.

Sapkota (2008) conducted a study on the topics "Problem 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 the schools, two schools were selected from 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 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.

KC (2009) conducted a research "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 are 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 for 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 has 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 areas. From each

school six students and one mathematics teacher were selected for the study. But 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 mathematics calculation mean weightage and observation note.The major problems were as the involvement of student in house work more than student in household work more than study, illiteracy of parents, lack of pre-requistic knowledge on the students of mathematics, irregularity of students in school, congested classroom, unavailability of physical facilities and lack of trained and experienced teachers.

Research Gap

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

Theoretical Literature

Two Dutch educators, Dina and Pierr 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 of 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 O (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: Information 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: Dedication

At this level the significance of dedication 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 closes, where students use formal logic to compare abstract systems often without

concrete model. Students reason formally about mathematics 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 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	Deducation	Students able to construct proofs using postulates axioms and definitions
Level 4	Rigor	Students can work in a variety of axiomatic systems

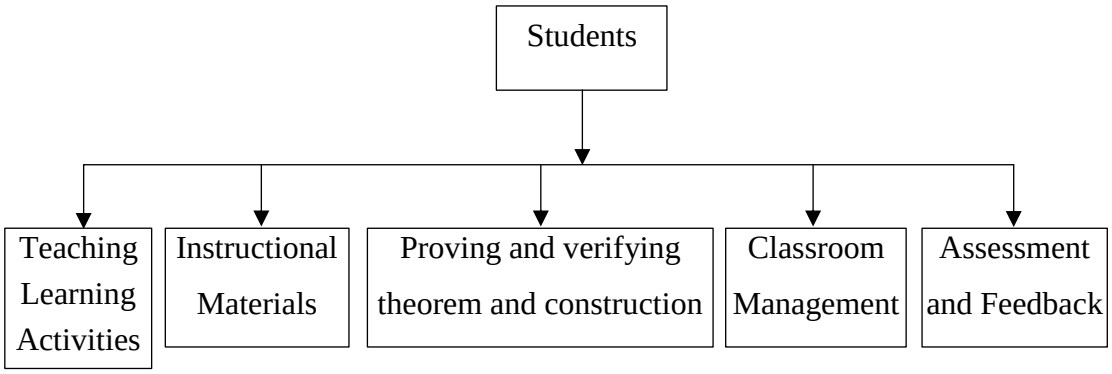
Conceptual Framework

Different approaches are used to identify the conceptual framework of the study. Out of them comprehensive understanding of the problem and implication of theoretical and empirical concepts are used for this study. The researcher intended to find out the learing problems of students in secondary school geometry. For this, curriculum, content, classroom management, instructional materials, teaching learing activites, proving and verifying theorem and construction, evaluation technique are more responsible. If above mentioned factors are used properly, the students can learn geometry easily. If the curriculum is not favor according to the interest of students, it is difficult to gain high achievement in any subject. School environment should be child friendly. Teaching materials should be attractive with low cost no cost and

proper size. Teaching learning activities should be child friendly and students centered. Evaluation should be done properly.

The diagrammatic representation of conceptual framework of this study is as given below:

Figure 1



Content Related Factors

Teaching activities. It is one of the most important factors that actually related the problem faced by students by various as: teachers of delivery, instructional environment and initiation of lesson, student's participation and teacher's activities are considered as the effective classroom teaching in this study.

Instructional materials. It is practical measurement of figures by geometrical instrument to prove the theorem. It helps to find the problem in sequential idea in verification and proper we of materials.

Proving and verification theorem and construction: The topic had raised the problems related on learning theorems. It is related to constructing geometrical shapes on the basis of given terms and conditions construction related to triangle, parallelogram or quadrilateral in a single diagram with equal area requires complex knowledge of analysis and combination of concepts, students having fewer concept of axioms, theorems and postulates mostly have the problem on construction.

Classroom management. Standard and advanced physical and instructional management helps is easy learning of complex structure. Arrangement of class, light and ventilation, cleanness, availability of furniture, quality and availability of writing board and graph board, computer as teaching equipment are some aspect of physical availability considered in this research.

Assessment and feedback. Evaluation informs about the present position and determines the points to be improved. It further gives the feedback, suggestion and motivates the learners and also the teacher for better progress. Verbal evaluation, unit test and terminal test result of the tools of evaluation techniques.

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 grade 'X' in Dhading 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 explain can be found in this chapter.

Research Design

Descriptive survey method was adopted to conduct the study. The chapter contains the procedure to be done to achieve the objective of the study. This research was used for the study because it helped me to find out related information regarding problem faced by students in learning geometry at secondary level. It was the research design that had to be carried out in small scale. It was widely employed in school and educational research.

In nutshell, descriptive survey method is conducted to eliminate important educational issues and data are collected from schools. Then the answers which are given by the sample students. The sample are though that whole group has given same type of information. It means, the researcher generalized the result obtained from sample to the whole students.

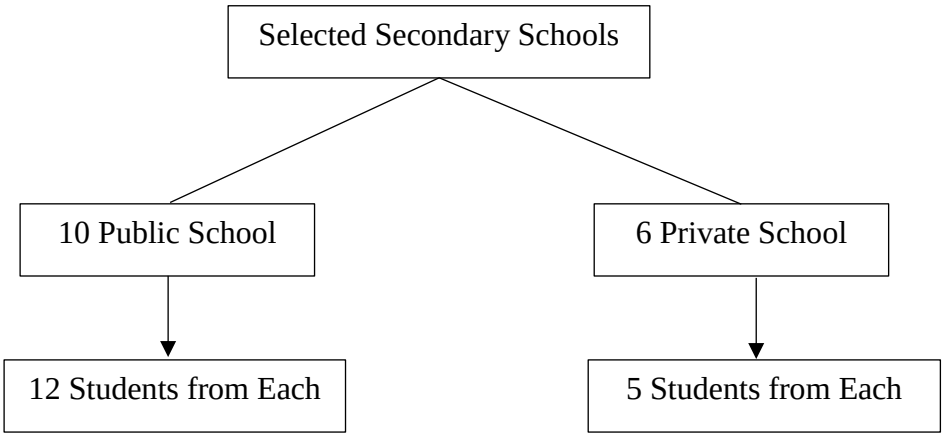
Population of the Study

Population in the entire field of concern where the result and findings are generalized. For this research study, the population is all students of Dhading district of grade X of academic year "2075 B.S."

Sample of the Study

According to the record of District Education Office, there are 132 community secondary schools and 22 institutional secondary school in Dhading district. Out of these secondary schools of Dhading district; the researcher selected 10 community and 6institutional schools by stratified random sampling methods a sample. The researcher selected 12 students from each 10 community school and 5 students from each 6 institutional schools by sample random sampling method.

Detailed Sample Characteristics



Instrument of the Study

Tools are very important factor for each study. There are certain tools for the quantitative and qualitative research to get information from the people about their experiences, ideas and beliefs. Questionnaire was regarded as the main tool of this study which were developed by researcher herself with the help of the supervisor. Questionnaire for the students consisted 18 questions concerning about teaching

learning activities, instructional materials, providing and verifying theorem and construction, classroom management, evaluation technique and so on. Therefore, 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 some questions concerning about teaching learning activities, instructional materials, evaluation techniques, classroom management and providing 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 schedule. 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 question 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 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 according to likert 5 points scale '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 likert scale is 1-5, 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 2: Meaning of Scale

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 1, in this 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 refered 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 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.

With the help of interview schedule. The interview was taken with key students. The interaction with the respondents was carefully listened properly. Related documents also reviewed and analyzed on the basis of need. The data from interviews consists of direct questions to people about their experiences, opinions, feeling and

knowledge. Each section of the questionnaire was start with sufficient direction and information for answering the question. The questions of questionnaire were constructed such that they would able to find out the actual problems of learning geometry. Van Hiele's five level of geometric thoughts have been used to construct the questions. The questionnaire has covered the following area: problems related to curriculum, content, teaching learning activities, classroom management, instructional materials, proving and verifying theorems, evaluating techniques. At the end, the respondents were requested to provide comments.

Chapter IV

Analysis and Interpretation

Data analysis and interpretation is the process of assigning meaning to the collected information and determining the conclusion, 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 sixteen secondary schools selected 6 from institutional and 10 from community area schools of Dhading 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 providing and verifying theorems and construction
- Problem related to classroom management
- Problem related to Assessment and Feedback

Teaching Learning Activities

Analysis and interpretation of the responses on teaching learning activities plays important role to shape knowledge and understanding the subject matter. Student's performance and perception depend upon now the teacher presents subject

matter. Students centered teaching methods are now highly appreciated. The student's responses on teaching learning activities are given below as:

Table 3: Students Responses on Teaching Learning Activities

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
1	The class starts from interesting way	40	77	13	19	1	3.90	No problem
2	Teacher gives extra parallel problems related with exercise	43	68	12	4	23	3.69	No problem
3	Teacher provide opportunity for weak students	15	49	11	32	43	2.74	Problem
4	The teacher also participate with you in classroom activities	53	59	7	19	12	3.82	No problem
5	We do not feel difficult while providing theorem	30	86	13	21	-	3.83	No problem
	Total						3.59	No problem

From the table presented above, it is found that there is no problem in statement 1, 2, 3, 4 and 5. The mean weightage of statements 1, 2, 4 and 5 are 3.90, 3.69, 3.82 and 3.83 respectively which are all more than 3. Therefore, it is true to say that teachers are starting class interesting way; give extra parallel problems related with exercise; they also participates with students in classroom and they didn't feel difficult while providing theorem. But there is a problem of statement 3.Then the

mean weightage of statement 3 is 2.74 which is less than 3. Therefore, most of the weak students facing problem in learning geometry.

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 subjects' 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 feel geometry is a hard subject because I must engage in household work like carrying water, making food, cutting grass etc. (B)

Geometry becomes hard subject to me because I use the evening time lay football, volleyball, carremboard, and listening folk song in mobiles as well a watching TV everyday as like. (C)

From the above response, it can conclude that students feel difficult in learning geometry. Some of the reasons of filling geometry difficulty; lake of interesting way of teaching geometry and difficulty in proving theorem; 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 that situation of problems related with instructional materials.

Table 4: Instructional Materials

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
6	Textbooks and practice books are available in time	27	84	7	27	5	3.67	No problem
7	Our teacher uses locally available and low cost materials in teaching geometry.	27	65	9	4	45	3.16	No problem
8	Manipulative geometrical materials are not available in our school	30	34	4	4	78	3.44	No problem
9	Less use of teaching materials	66	52	7	9	15	2.01	Problem
10	Teachers use instructional materials while teaching geometry	6	15	5	5	119	1.56	Problem
	Total						2.76	Problem

The analysis of table 4 shows that total mean weightage of statements is 2.76 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 and 8 have mean weightage 3.67, 3.16 and 3.44 respectively which

followed that students were in favor of the problems with availability of textbook, uses of locally materials and availability of manipulative 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 center.

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 this schools. The only materials available in school were some mathematics charts, models cardboards, plywood tools and some textbook in 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-recorded, microcomputer, 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 period of mathematics class. Teaching materials had not been used because of large number of class size.

To explore the possible cause in facing problem on instructional materials, the researcher asked a question to the students. Then students replay as follows:

Teacher does not use materials except geometry box and daily used materials at teaching. (D)

I feel that geometry is the hardest topic in mathematics because of my pre-knowledge and teacher does not care us he use to forward lesson according to talent students only. (E)

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. (F)

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. (G)

The above view of students shows that there is lack of the teaching materials. There is large number of students in the classroom student feel difficulty for learning and teacher cannot 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 number 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 skills 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 5 illustrates the student's responses on problems of proving and verifying theorems and construction.

Table 5: Proving and Verifying Theorems and Construction

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
11	Teaching materials are used in teaching theorems and exercise	34	56	4	7	49	3.12	No problem
12	Our teacher uses geometrical instrument while teaching construction	6	15	5	5	119	1.56	Problem
13	Geometrical theorems of secondary level related with life	45	90	4	11	-	4.13	No problem
14	Example and exercises of theorems are highly correlated	41	87	5	17	-	4.01	No problem
	Total						3.20	No problem

Teaching construction and verifying the theorems are less priority in maximum school. Using the mean weightage of no. 11, 13 and 14 claims that most of the students are satisfy when the proving theorems and construction. And the mean weightage of no. 12 claims that most of the students are facing problems that teacher uses geometrical instrument while teaching construction.

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. (H)

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

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.

Classroom Management

Education have been aware that the quality of classroom management is an important factor for students achievement and teaching success. We have written about management rather than control in classroom because management emphasizes that learning and teaching are complementary activities just as successful managers in commerce and industry void dispute which disturb production. Therefore, in the classroom, successful teachers have the capabilities to provide remarkable learning

activities so that students can develop their conceptual thinking. The overall situation concerned with classroom management is given in Table 6.

Table 6: Students' Responses about Classroom Management

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
15	We feel difficulties while participating in the congested classroom	34	65	5	12	34	3.35	No problem
16	Problems of the textbooks are related to the daily life of students	15	49	11	32	43	2.74	Problem
17	We have no any problems of blackboard and other furniture in our classroom	70	53	2	11	14	4.02	No problem
18	We solve our mathematical problems in group	33	47	12	21	37	3.12	No Problem
19	Anything written in blackboard is visible	77	59	2	6	6	4.3	No problem
	Total						3.50	No problem

However, during the research period it had been found that students were disagreed about the classroom management in teaching geometry mean weightage of item 16 has 2.74 which follows that students problems of the textbooks are not related to the daily life of students. Item number 15, 17, 18 and 19 have mean weightage 3.35, 4.02, 3.12 and 4.3 respectively which follows that students are in favor of the

problems with congested classroom, group work activities and visibility of blackboard. The total mean of statement is 3.5 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 replay as follows:

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. (J)

From the above responses of the related respondent's 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 students view we concluded that there is lack of teaching materials in classroom and demonstration place which cause hinter in learning geometry.

Assessment and Feedback

The primary responsibility of a teacher is to using about the maximum degree of students achievement in learning. Evaluate services such as examination of various types, oral quizzes and different class activities are essential evaluation process of evaluation techniques. The main purpose of the evaluation program may be to help more intelligent guidance in learning. Table No. 7 presents the situations related with the problems in evaluation technique.

Table 7: Students Responses on Assessment and Feedback

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
20	The teacher checks our homework daily.	48	90	4	5	3	4.16	No problem
21	The teacher take the test at the end of each unit.	15	31	3	24	77	2.22	Problem
22	Our teachers takes different types of test except terminal exam.	19	40	10	14	67	2.53	Problem
23	Teaching is only exam oriented.	24	70	5	32	19	3.32	No problem
24	The teachers focus on our creativity and curiosity.	28	48	10	24	40	3.00	No problem
25	Contents of the given textbook are related to lower classes.	57	79	7	5	2	4.22	No problem
26	Teachers give the feedback.	44	57	2	13	34	3.42	No problem
27	All geometrical problems are included in exam.	70	58	6	13	3	4.19	No problem
28	The first priority is not given to teach geometry.	55	59	4	28	4	2.11	Problem
	Total						3.24	No problem

The total mean weightage 3.24 indicates the most students are in favor of the problems of evaluation techniques. During research and analysis of table 7, it had been found the most of students especially in items 20, 23, 24, 25, 26 and 27 with mean weightage 4.16, 3.32, 3.00, 4.22 and 4.19 respectively are in favor of the problems. The items 21, 22, and 28 with means weightage 2.22, 2.53, and 2.11 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 problem, easily. (K)

I also feel geometry as an interesting and easy subject. But sometime of teacher does not give clear concept in proving and verifying the geometry theorems, then I used to feel lazy. (L)

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. (M)

Yes, I am feeling geometry is hard subject because in the class our teacher never uses the teaching materials and he always was the lecture method. He also

follows the summative evaluation system and he is unknown about the using and constructing the local materials. (N)

Study of 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 text exam.
- The evaluation of classroom activities is not included into terminal examination.

In conclusion, various problem 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 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 corner spend their valuable time to arrival and departure and at that time they spend it by joking, singing and love affairs which are not related to study.

Comparison of Problems Faced by Institutional and Community School Students

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 8.

Table 8: Mean and Standard Deviation of Sample Schools Students

Group compared	Mean	S.D.	Number of students	df	Calculated value	Tabulated value
Institutional school students	$X_1 = 89.83$	$S_1 = 6.14$	$n_1 = 30$	$n_1+n_2 -2 = 148$	-0.296	1.645
Community school students	$X_2 = 90.96$	$S_2 = 44.07$	$n_2 = 120$			

From the analysis of table 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. The datiled of the result is presented in appendix-H.

It has shown that calculated value of institutional and community students is -0.296 at 5% level of significance and 148 degree of freedom. Whereas tabulated value given at the same degree of freedom and level of significance is 1.645. It shows that tabulated value exceeds the calculated value for two tailed test so that the value falls on acceptance regions. Thus, null hypothesis is concluded that there is no difference between the problems faced by institutional and community school students. This means that the students of government school and institutional have same problems in learning geometry.

Chapter V

Summary, Finding, Conclusion and Implications

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

Summary and Findings

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

The specific objectives of the study were:

- To find the problems faced by students in learning geometry at secondary level.
- To compare the problem faced by community and institutional school students in learning geometry at secondary level.

This study was entirely survey type. The population of this study consisted of entire mathematics students of both institutional and community of Dhading 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 sample random sampling method. The collected data were quantified based on linkert. 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 the students have been facing numerous problems in geometry learning at secondary.

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 school students in learning geometry at secondary level are not significantly different.

Conclusion

The above findings of the study concluded that teaching learning geometry in Dhading district was not satisfactory. There have been significant problems in learning geometry in curriculum and content, teaching learning activities, proving and verifying theorem and constructions, classroom management, instructional materials and evaluation techniques. Also, it concluded that there is no difference between the problems faced by community and instructional school students in geometry.

Although the school have qualified teachers but the teacher seems to be unable to maintain indifferences and promote students in teaching learning activities. Teaching method and materials, student irregularity, home environment, school environment and the contents of the geometry were the main causes that make difficulty to students in learning geometry.

At last, it can be said that teachers should provide clear concept in geometrical shape and figure for students. They should be provided with the easy materials and methods. They should be given the extra classes for the solving process of mathematical problem. So, the geometrical problem of them can be solved.

Implications

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 part of Nepal.
- This kind of studies should also be conducted at all levels of schools and in other subjects as well.
- The District Education Office should manage the inter resource center visiting and observing the mathematical classes and also should play vital role of organizing the inter district level mathematical conference.
- The school administration should interact to the students, teacher, 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.

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Appendix A

Questionnaire

Dear Students

I am a master's degree student of Mathematics 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 identifying 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

Babita Silwal

Department of Mathematics Education

Appendix B

Questionnaire for Students

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
1	The class starts from interesting way	40	77	13	19	1	3.90	No problem
2	Teacher gives extra parallel problems related with exercise	43	68	12	4	23	3.69	No problem
3	Teacher provide opportunity for weak students	15	49	11	32	43	2.74	Problem
4	The teacher also participate with you in classroom activities	53	59	7	19	12	3.82	No problem
5	We do not feel difficult while providing theorem	30	86	13	21	-	3.83	No problem
	Total						3.59	No problem

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
6	Textbooks and practice books are available in time	27	84	7	27	5	3.67	No problem
7	Our teacher uses locally available and low cost materials in teaching geometry.	27	65	9	4	45	3.16	No problem
8	manipulative geometrical materials are not available in our school	30	34	4	4	78	3.44	No problem
9	Less use of teaching materials	66	52	7	9	15	2.01	Problem
10	Teachers use instructional materials while teaching geometry	6	15	5	5	119	1.56	Problem
	Total						2.76	Problem

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
11	Teaching materials are used in teaching theorems and exercise	34	56	4	7	49	3.12	No problem
12	Our teacher uses geometrical instrument while teaching construction	6	15	5	5	119	1.56	Problem
13	Geometrical theorems of secondary level related with life	45	90	4	11	-	4.13	No problem
14	Example and exercises of theorems are highly correlated	41	87	5	17	-	4.01	No problem
	Total						3.20	No problem

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
15	We feel difficulties while participating in the congested classroom	34	65	5	12	34	3.35	No problem
16	Problems of the textbooks are related to the daily life of students	15	49	11	32	43	2.74	Problem
17	We have no any problems of backboard and other furniture in our classroom	70	53	2	11	14	4.02	Problem
18	We solve our mathematical problems in group	33	47	12	21	37	3.12	No Problem
19	Anything written in blackboard is visible	77	59	2	6	6	4.3	No problem
	Total						3.50	No problem

S.N.	Statements	SA	A	U	DA	SDA	Mean weightage	Remarks
20	The teacher checks our homework daily.	48	90	4	5	3	4.16	No problem
21	The teacher take the test at the end of each unit.	15	31	3	24	77	2.22	Problem
22	Our teachers takes different types of test except terminal exam.	19	40	10	14	67	2.53	Problem
23	Teaching is only exam oriented.	24	70	5	32	19	3.32	No problem
24	The teachers focus on our creativity and curiosity.	28	48	10	24	40	3.00	No problem
25	Contents of the given textbook are related to lower classes.	57	79	7	5	2	4.22	No problem
26	Teachers give the feedback.	44	57	2	13	34	3.42	No problem
27	All geometrical problems are included in exam.	70	58	6	13	3	4.19	No problem
28	The first priority is not given to teach geometry.	55	59	4	28	4	2.11	Problem
	Total						3.24	No problem

Appendix C

Response Score of Community Students in Questionnaire

S.N.	Statements	SA	A	U	DA	SDA	Total
1	Class starts from interesting way	100	276	39	36	-	451
2	Teacher gives extra parallel problems related with exercise given in the textbook	185	200	18	8	23	434
3	Teacher provide opportunity for weak students	170	200	6	4	32	412
4	The teacher also participates with you in classroom activities	230	156	21	34	11	452
5	We do not feel difficult while providing theorem	27	138	27	60	-	252
6	Textbooks and practice books are available in time	120	304	3	28	5	460
7	Our teacher uses locally available and low cost materials in teaching geometry.	135	180	9	4	43	371
8	Manipulative geometrical materials are not available in our school	30	68	12	16	390	516
9	Less use of teaching materials	265	160	9	16	16	466
10	Teachers use instructional materials while teaching geometry	80	124	24	28	51	307
11	Teaching materials are used in teaching theorems and exercise	160	128	9	12	47	356
12	Our teacher uses geometrical instrument while teaching construction	30	60	12	6	92	200
13	Geometrical theorems of secondary level related with life	180	284	9	20	-	493

S.N.	Statements	SA	A	U	DA	SDA	Total
14	Example and exercises of theorems are highly correlated	190	304	9	6	-	509
15	We feel difficulties while participating in the congested classroom	135	212	6	18	29	400
16	Problems of the textbooks are related to the daily life of students	13	88	21	104	150	376
17	We have no any problems of backboard and other furniture in our classroom	57	88	6	6	14	171
18	We solve our mathematical problems in group	160	104	30	36	34	364
19	Anything written in blackboard is visible	340	160	6	10	5	521
20	The teacher checks our homework daily.	200	284	6	8	3	501
21	The teacher take the test at the end of each unit.						
22	Our teachers takes different types of test except terminal exam.	95	156	30	12	46	339
23	Teaching is only exam oriented.	110	220	9	44	18	401
24	The teachers focus on our creativity and curiosity.	13	90	24	64	190	381
25	Contents of the given textbook are related to lower classes.	200	264	21	10	2	497
26	Teachers give the feedback.	270	176	18	16	3	393
27	All geometrical problems are included in exam.	44	110	6	48	35	243
28	The first priority is not given to teach geometry.	38	108	12	80	20	258

Appendix D

Number of Respondents in the Questionnaire of Community School Students

S.N.	Statements	SA	A	U	DA	SDA	Total
1	The class starts from interesting way	20	69	13	18	-	120
2	Teacher gives extra parallel problems related with exercise given in the textbook	37	50	6	4	23	120
3	Teacher provide opportunity for weak students	34	50	2	2	32	120
4	The teacher also participates with you in classroom activities	46	39	7	17	11	120
5	We do not feel difficult while providing theorem	27	69	9	15	-	120
6	Textbooks and practice books are available in time	24	76	1	14	5	120
7	Our teacher uses locally available and low cost materials in teaching geometry.	27	5	3	2	43	120
8	Manipulative geometrical materials are not available in our school	30	33	4	4	49	120
9	Less use of teaching materials	53	40	3	8	16	120
10	Teachers use instructional materials while teaching geometry	16	31	8	14	51	120
11	Teaching materials are used in teaching theorems and exercise	32	32	3	6	47	120
12	Our teacher uses geometrical instrument while teaching construction	6	15	4	3	92	120
13	Geometrical theorems of secondary level related with life	36	71	3	10	-	120

14	Example and exercises of theorems are highly correlated	38	76	3	3	-	120
15	We feel difficulties while participating in the congested classroom	27	53	2	9	29	120
16	Problems of the textbooks are related to the daily life of students	13	44	7	26	30	120
17	We have no any problems of backboard and other furniture in our classroom	57	44	2	3	14	120
18	We solve our mathematical problems in group	32	36	10	18	34	120
19	Anything written in blackboard is visible	68	40	2	5	5	120
20	The teacher checks our homework daily.	40	71	2	4	3	120
21	The teacher take the test at the end of each unit.	15	31	3	13	58	120
22	Our teachers takes different types of test except terminal exam.	19	39	10	6	46	120
23	Teaching is only exam oriented.	22	55	3	22	18	120
24	The teachers focus on our creativity and curiosity.	13	45	8	16	38	120
25	Contents of the given textbook are related to lower classes.	40	66	7	5	2	120
26	Teachers give the feedback.	54	44	6	13	3	120
27	All geometrical problems are included in exam.	44	55	2	17	7	120
28	The first priority is not given to teach geometry.	38	54	4	20	4	120

Appendix E

Response Score of Institutional Student in Questionnaire

S.N.	Statements	SA	A	U	DA	SDA	Total
1	The class starts from interesting way	100	32	-	2	1	135
2	Teacher gives extra parallel problems related with exercise	30	72	18	-	-	120
3	Teacher provide opportunity for weak students	5	-	12	28	11	51
4	The teacher also participates with you in classroom	35	80	-	6	1	122
5	We do not feel difficult while providing theorem	3	34	12	24	-	73
6	Textbooks and practice books are available in time	15	32	18	26	-	91
7	Our teacher uses locally available and low cost materials in teaching geometry	-	80	18	4	2	104
8	Manipulative geometrical materials are not available in our school	-	4	-	-	29	33
9	Less use of teaching materials	65	48	12	3	-	128
10	Teachers use instructional materials while teaching geometry	10	104	6	-	-	120
11	Teaching materials are used in teaching theorems and exercise	10	96	3	2	2	113
12	Our teacher uses geometrical instrument while teaching construction	-	-	3	4	27	34
13	Geometrical theorems of secondary level related with life	45	76	3	2	-	127

14	Example and exercises of theorems are highly correlated	15	44	6	28	-	93
15	We feel difficulties while participating in the congested classroom	35	48	9	6	5	103
16	Problems of the textbooks are related to the daily life of students	2	10	12	24	65	113
17	We have no any problems of backboard and other furniture in our classroom	13	18	-	32	-	63
18	We solve our mathematical problems in group	5	84	6	6	3	104
19	Anything written in blackboard is visible	5	76	-	2	1	124
20	The teacher checks our homework daily.	40	76	6	2	-	124
21	The teacher take the test at the end of each unit.	-	-	-	22	19	41
22	Our teachers takes different types of test except terminal exam.	-	4	-	16	21	41
23	Teaching is only exam oriented.	10	60	6	20	1	97
24	The teachers focus on our creativity and curiosity.	15	6	6	32	10	69
25	Contents of the given textbook are related to lower classes.	85	52	-	-	-	137
26	Teachers give the feedback.	80	56	-	-	-	136
27	All geometrical problems are included in exam.	-	4	-	4	135	143
28	The first priority is not given to teach geometry.	17	10	-	32	-	59

Appendix F

Number of Respondents in the Questionnaire of Institutional School Students

S.N.	Statements	SA	A	U	DA	SDA	Total
1	The class starts from interesting way	20	8	-	1	1	30
2	Teacher gives extra parallel problems related with exercise	6	18	6	-	-	30
3	Teacher provide opportunity for weak students	1	-	4	14	11	30
4	The teacher also participates with you in classroom	7	20	-	2	1	30
5	We do not feel difficult while providing theorem	3	17	4	6	-	30
6	Textbooks and practice books are available in time	3	8	6	13	-	30
7	Our teacher uses locally available and low cost materials in teaching geometry	-	20	6	2	2	30
8	Manipulative geometrical materials are not available in our school	-	1	-	-	29	30
9	Less use of teaching materials	13	12	4	1	-	30
10	Teachers use instructional materials while teaching geometry	2	26	2	-	-	30
11	Teaching materials are used in teaching theorems and exercise	2	24	1	1	2	30
12	Our teacher uses geometrical instrument while teaching construction	-	-	1	2	27	30
13	Geometrical theorems of secondary level related with life	9	19	1	1	-	30

14	Example and exercises of theorems are highly correlated	3	11	2	14	-	30
15	We feel difficulties while participating in the congested classroom	7	12	3	3	5	30
16	Problems of the textbooks are related to the daily life of students	2	5	4	6	13	30
17	We have no any problems of backboard and other furniture in our classroom	13	9	-	8	-	30
18	We solve our mathematical problems in group	1	21	2	3	3	30
19	Anything written in blackboard is visible	9	19	-	1	1	30
20	The teacher checks our homework daily.	8	19	2	1	-	30
21	The teacher take the test at the end of each unit.	-	-	-	11	19	30
22	Our teachers takes different types of test except terminal exam.	-	1	-	8	21	30
23	Teaching is only exam oriented.	2	15	2	10	1	30
24	The teachers focus on our creativity and curiosity.	15	3	2	8	2	30
25	Contents of the given textbook are related to lower classes.	17	13	-	-	-	30
26	Teachers give the feedback.	16	14	-	-	-	30
27	All geometrical problems are included in exam.	-	2	-	1	27	30
28	The first priority is not given to teach geometry.	17	5	-	8	-	30

Appendix G

Guidelines for Interview with Geometry Mathematics Students

Name : Age : Sex :

Father's Name : Qualification : Occupation :

Mother's Name :

Schools' Name :

Nature : Community/Institutional

Time to reach school :

The interview with compulsory mathematics students was taken on the basis of following main topic.

- Teaching learning activities

Starting situation, methods, response, management, question/evaluation system, summarize

- School environment of classroom managements
- Instructional materials

Nature of materials, effectiveness etc.

- Opportunity provided by school group work given in classroom.
- Extra related subject matter in classroom activities.
- Reasons of feeling geometry as hard topic.

Appendix H

Statistical Formula

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$\overline{X_1}$ = Mean of the first sample.

$\overline{X_2}$ = 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

PROBLEMS FACED BY STUDENTS IN LEARNING GEOMETRY

A

THESIS

BY

BABITA SILWAL

FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

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