

Chapter - I

INTRODUCTION

Background of the Study

Mathematics is playing an outstanding role in the society. Being social animal man has to face many social, political, economic problems. Mathematics develops science; science develops technology and politicians to rule over the nation use technology. Therefore, it is necessary for the nation. We can say that mathematics helps us to think rationally, logically and creatively to solve the problems. It is one of the most useful and fascinating divisions of human knowledge.

Geometry is one of the most useful and important branch of mathematics. Geometry includes an enormous range of ideas and can view 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 seen of trying to prove a mathematical rule by reasoning rather by testing it in different ways". The word geometry is derived from the Greek words, geometria which means measuring of 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 of geometry" (Betler and Wren, 1941).

School mathematics of Nepal has given emphasis on geometry learning from the beginning of schooling. The curricula have aimed to develop students understating 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, problems solving skills and communicating. 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. Thus, geometry is regarded as core content area of school mathematics programme. It is the most important and integral part of school mathematics curricula showing the importance of geometry from kindergarten through school, geometry is a natural vehicle for developing instruction, creativity and a spirit of inquiry. Furthermore, geometry is a fertile source for interesting and challenging problems and geometrical methods are powerful tools in problem solving.

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, 2008).

There are varies researchers about teachers and students problems. Many government and non – government official research indicate the investment of huge 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 are occurring frequently.

In this 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, Economic factors, Evaluation system.

Statement of the Problem

The new curriculum of Geometry is secondary level has been implemented in Nepal since 2055 B.S. and the students seen average have become under the achievement. Therefore, 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.

Teaching geometry so that students learn it meaningfully requires an understanding of how students construct their knowledge of various geometric topics. This means it is necessary that mathematics educators investigate and mathematics teachers understand how students construct geometrical knowledge because of their learning experiences in school. An important aspect of this research direction is the study of the strategies that students use in different geometrical tasks as well as the identification of their mistakes. In this study, we see that errors were for the first time viewed positively, in the sense that they allow the tracing of the reasoning mechanisms adopted by students. Thus, this study to seek the answer of the followings questions:

-) What are the current problems faced by students in learning geometry at Grade X?
-) What pedagogical remedies and tactics do the teachers use to help students overcome these problems?

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 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 classed. As a result, most to 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.

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

-) It explains about the problems, are being faced the mathematics students.
-) It certainly improves the mathematics problems by means and ways that one being faced by students.
-) It helps in designing a revised mathematics curriculum at Grade X.
-) It helps to create sound environment to parents as well as concern administration.

-) It sets up this 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 is to be sure whether the mathematics students face only academic or other problems also.

Objective of the Study

The main objectives of this study as follows.

-) To identify the problems faced by students in geometry at Grade X.
-) To find out the problems related to prove and verify theorem and construction.

Delimitation of the Study

This study limits to the following facts:

-) This study concerns with only the problems faced by the students of Grade X in learning geometry.
-) Only 150 students from 10 sampled schools select in this study.
-) This study is carried out only in the urban and rural public schools of Sarlahi district.
-) The problems of learning would be explored on the basis of questionnaire form, interview schedule and class observation form.

Definition of Related Terms

Problem

In this study, the word problem defines as any obstacle that may hinder teacher's success in generating an environment conducive to the learning and teaching of Geometry.

Students

The students who are studying at grade X at Sarlahi district.

Teachers

Teachers who are teaching mathematics at grade X at Sarlahi district.

Geometry

The science that treats of the shape and size of things, the science of properties and relation of lines and solids at grade X.

Curriculum

Mathematics curriculum, which has been implemented at present at grade X of government of Nepal.

Physical facilities

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

Chapter - II

REVIEW OF THE RELATED LITERATURE

Review of the related literature would make in order to know what has already done to determine what is to do in the area to be studied. It was essential to review the related literature to compare the study, which provided strong knowledge about the related topic. Among the literature review, some had related to problems faced by students in learning Geometry. Researcher found that during the past years there are many more studies had done about the attitudes of teaching profession, studies on the attitudes of the teachers and students towards mathematics and achievement of student in mathematics in different locations and different classes of school level. However, researcher could not found many more investigation on the problems faced by students in learning geometry at secondary level of Sarlahi District. The researcher had reviewed some related literature as follows:

Empirical Literature

CERID (1988), stated that most of the teaching in secondary school consists of lecturing, rote memorization and group reciting. Students interaction and question answer techniques have rarely practiced. Little opportunity had provided for independent study, laboratory experience, community study, working with one's hand and so on. The causes responsible for this state of affairs had mostly connected with lack of training among the teachers, large class size in urban areas and poor physical facilities in rural school.

Sapkota (2008) concluded 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 researchers selected four schools.

Out of the 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 talking unit test which indicates the problems faced by students in their mathematics learning. Also the problems were found to the teaches discrimination to the weak and talent students did not have positive attitude towards mathematics teacher and did not find the interest of solving new mathematics problems in classroom, friendly school environment and teachers difficulties due to large number of students.

Gyawali (2009) did a thesis on the title “Effectiveness of Van Hiele approach in teaching Geometry at Secondary Level”. He selected the sample consisting of forty students purposively from Nawalparasi district. He taught the experimental group by employing Van Hiele approach and the control group by conventional approach. His result also revealed that the mean score of the students of the students of the experimental group was greater than that of the control group. Thus he concluded that Van Hiele approach is effective in teaching geometry than the conventional approach.

KC (2009) concluded a thesis “A study of problem faced by students in compulsory mathematics at secondary level”. The nature of this study was quantities 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 from 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.

Poudel (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 from were the main tools for data collection. The obtained data were analyzed with the help of mathematical calculation mean weight age and observation note. The major problems were as the involvement of student in house work more than student in household work more that students, 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.

Bhatta (2013), did a survey study on "Problems faced by the students in geometry at secondary level of Kailali district". The researcher developed the questionnaire, observation from and interview shedule under the guidance of supervisor and researcher added some problems himself with advice of experienced mathematics teacher. The main purpose of the study is to identify the problems faced the mathematics students in geometry at secondary level of Kailali district. The

researcher has presented recommendation that will be benefited to the concerned authority further improvement in the geometry teaching. The problems aroused teaching learning activities, instructional materials, and evaluation system. From the above stated findings of this study, it can be concluded that teaching and learning of geometry was not satisfactory in Kailali district.

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

Theoretical Framework

Two Dutch educators, Dina and Pierre Van Hiele, suggested that children may learn geometry along the lines of a structure for reasoning that they developed in the 1950's, educators in the former Soviet Union learned of the Van Hiele research and changed their geometry curriculum in the 1950's during the 1980's there was interest in the united states in Van Hieles' contributions of the National Council of Teachers Mathematics (1989) bought the Van Hiele model of learning closer to implementation by stressing the importance of sequential learning and an activity approach. The five learners of geometry thought did 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 were given below.

Level 0: Visualization

Students recognize figures as total entities but do not recognize properties of these figures.

Level 1: Analysis

Students analyzed component part of the figure but, interrelationship between figures and properties cannot be explained.

Level 2: Informal deduction

Students could establish interrelationship of properties within figures (in a quadrilateral, opposite sides being parallel necessities opposite angles being concurrent) and among figures (a square is a rectangle because of has all the properties of a rectangle) informal proofs could 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 was understood. The interrelationship and role of undefined terms, axioms, definitions, theorems and formal proof was seen.

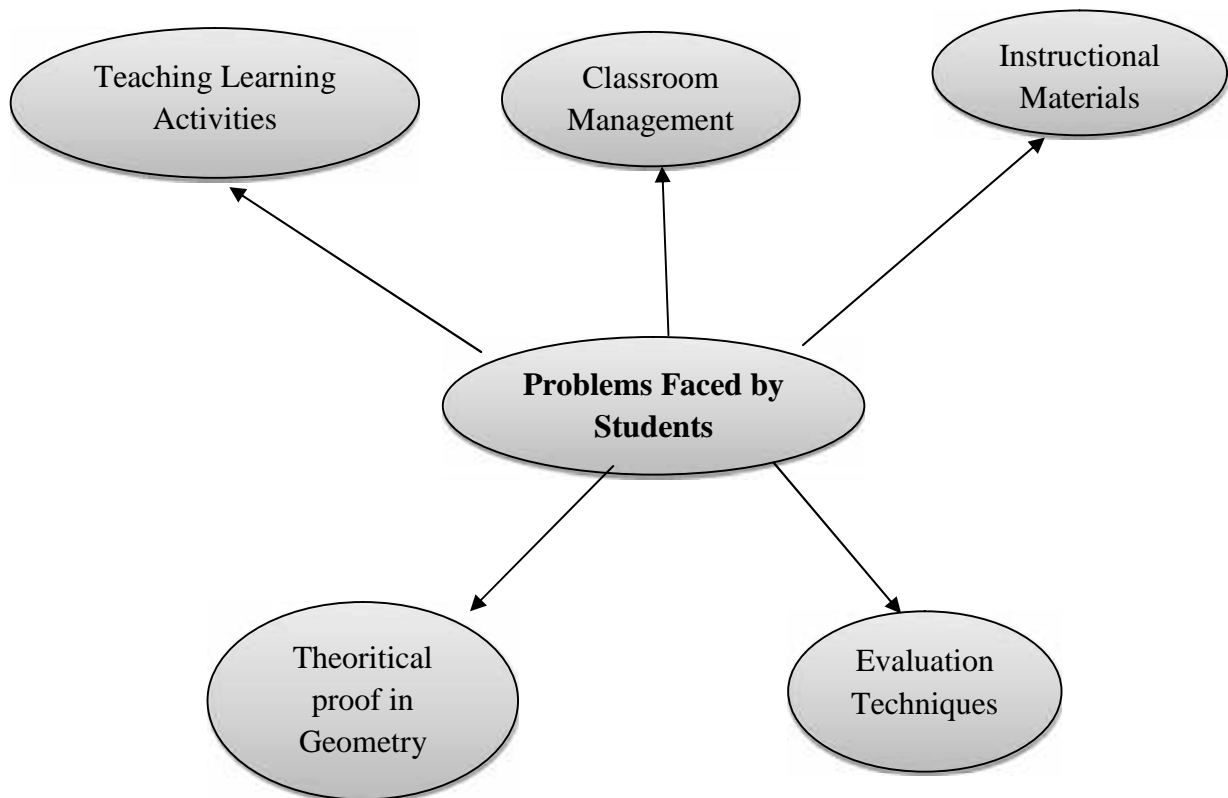
Level 4: Rigor

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

Conceptual Framework for This Study

The conceptual framework is the key design of the basic concept of the research. This study had based Two Dutch educators, Dina and Pierre Van Hiele, theory.

Figure 1: Conceptual framework



(Source: Bhatta, 2013)

In the current study, it was argued that teacher knowledge influences the depth of teaching and, in turn, the quality of learning. This study assumes a position that the knowledge of teachers who are under qualified could be upgraded through in-service education and training programmes, the use of high quality textbooks and by elevating teacher background (qualifications, subject major, teaching experience). The framework of this study is highlighted in following figure. This figure illustrated the relationship between variables which determine the cause of problems encountered in

the teaching and learning of Geometry in grade 10. It showed that problems experienced by both teachers and learners during instruction are the result of teacher knowledge (i.e. the teachers pedagogical knowledge, content knowledge and pedagogical content knowledge) which is, in turn, influenced by various factors. These factors included in-service education and training programmes, quality of teaching and learning materials (textbooks) and teacher background (qualification, subject major, teaching experience). These are extraneous variables which must be controlled if the problems encountered in the teaching and learning of statistics are to be addressed.

The above mentioned a framework is drawn with help of the previous literature review which is mentioned as empirical literature. The researcher collected the information on the basis of teaching methods and materials, student's activities and content of geometry. From the conceptual framework the researcher constructed different tools such as written test question, interview schedule and observation guideline for the students, which are described in chapter III. The content of the geometry the factor are angles and parallel lines, properties lines, properties of triangle, parallelogram, rectangle, square and concurrent and similar triangles etc. classroom observation was the basis of following main topics initiation of lesson, subject matter and sequences, instructional materials, students participation, teaching activities, closing of lesson, classroom management, teaching methods used, assessment techniques used. Then the researcher compared the information with the formation from Van-Hiele's learning theory to find the difficulties in learning geometry for grade X students.

Chapter - III

METHODS & PROCEDURES

By definition, a research study was carried out to identify and analyze the problems faced by students in teaching geometry in secondary school. It presents the logistic of study because it determines how a research becomes complete and systematic. This research study is descriptive in nature. This chapter consists the procedure of the study, which carried out to achieve the objective and to get answer of the research question. In this chapter, describes the research design of the study, population and sample of the study, source of data, tools of data collection, data collection procedure, data analysis and interpretation.

Design of the Study

This study was adopted a quantitative research approach and followed a descriptive survey research design. In a survey, study information is assessed on attitudes, opinions and behaviour or characteristics of a population (Creswell, 2011: 376). In the current study, teachers and learners views and opinions on problems encountered in the teaching and learning of Geometry are explored. This design was allowed the researcher to observe, interview and ask participants to complete a questionnaire and write a diagnostic test to uncover problems encountered in the teaching and learning of statistics in schools (Creswell, 2011; Cohen, Manion & Morrison, 2007) used this design to document what educators and learners perceived as difficult topics in Geometry. According to Creswell (2011: 376) descriptive survey designs differ from experimental research in that they do not involve a treatment to participants by researcher. Because, survey researchers do not experimentally manipulate the conditions, and they cannot explain cause and effect. Creswell (2011: 376) also indicates that survey research designs differ from correlational designs

because their focus is directed more toward learning about the population and less on relating variables or predicting outcomes, as is the focus in correlational research.

Population of the Study

This study was conducted at secondary school of Sarlahi district. There was different types of secondary schools public, institutional and community. The population of the study consists of all students enrolled in grade X of the public schools in 2072 B.S. in Sarlahi district. The research design is that of a survey focusing on of 150 mathematics students drawn from two high schools in Barahathawa and Solti place of Sarlahi district. The study was carried out in the natural school setting of the participants. As a research approach, a survey specially investigates the particularity and uniqueness of single case, coming to understand its activity within important circumstances. The research design of the study was survey types in which meaning were derived from face interview, and direct observation linking with Van-Hiele theory.

Sample of the Study

Sampling was the process of obtaining sample from the universe. The survey was carried out at sample basis the sample of this study is select from Sarlahi district by stratified random sampling method so as to obtain the good representation of the population. Considering the fact that however one selects the sample, it must be representative of the population, the researcher first collected the complete list of the schools from the District Education Office Sarlahi and then total schools were divided into urban and rural area, here the urban area means Solti from where 10% public school are select. The rural areas were geographically divided into four strata: northern, southern, eastern and western part of the district 10% secondary level schools will be select randomly by using random numbers. Then all the students of

grade X who were available at the visit time consists the sample of the study.

Furthermore, interview was also taken for the mathematics teachers also, who were taking responsibility for teaching.

Tools for Data Collection

Data collection was the important part of the study. On the basis of data techniques, we could study and analyze every aspect of the study. In this study questionnaire was regarded as the main tool of this study which was develop by researcher himself with the help of the supervisor. Two separate questionnaires were developing for the teacher and students. Questionnaires for the teacher consisted 10 questions about objectives of curriculum, content in curriculum, textbook method, instructional materials, teacher training, classroom management, physical facilities and evaluation techniques and so on. Similarly, questionnaire for the students considered 20 questions concerning about teaching learning activities, instructional material, and evaluation techniques and so on. The validity of the questionnaire was check and approve by supervisor.

Questionnaires

Two forms of questionnaires were used in the study, namely learner questionnaires and teacher questionnaires. The subsection discusses the purpose of each of the questionnaires.

Learner questionnaire

A learner questionnaire was used to collect data on the problems learners encountered in the learning of Geometry. It also provided learners with an opportunity to reflect on the problems their teachers face in the teaching of Geometry. Problems which teachers faced in the teaching of statistics.

Teacher questionnaire

The purpose of the teacher questionnaire was to collect data on (1) the problems encountered in the teaching of Geometry (2) the causes of these problems (3) teachers' suggestions on how to alleviate the problems encountered in the teaching of Geometry.

Classroom observation

According to Cohen, Manion & Morrison (2007:398), observation enables researchers to gather live data from naturally occurring social situations. Robson (2002:310) explains that observation provides a reality check because what people do may differ from what they say they do. In this study, observation of learners and teachers in the classroom will be conducted for the following reasons: (1) to identify the kind of problems encountered in the learning and teaching of Geometry (data handling implied) (2) to check whether all the topics on data handling will be taught at schools and (3) to discover things that learners and teachers do not feel free to mention in questionnaires (Cohen, Manion & Morrison, 2007).

Interviews

Teacher and learners were interviewed according the relevant schedule, respectively. The subsection presents descriptions of each schedule.

Interview Guideline for Students

Learner interviews were used to obtain further information and clarification on learner's responses to the questionnaires and diagnostic test. The interview helped to ascertain learner's feelings and concerns about the problems they experienced while learning statistics. Baloyi (2011:189) believes that, unlike researchers, who in effect spend very little time with teachers through interviews or observations, learners usually spend a minimum period of a year in the company of their teacher. This

means that learners could provide valuable information on the events within classroom environments. In this regard, the interview was confined to a group of ten learners.

Interview Guideline for Teacher

Teacher interviews were also used as follow-up on certain responses to the teacher's questionnaire to obtain further information and clarification these answers. The interviews were confined to a group of seven teachers.

Data Collection Procedure

The data had collect by primary sources. For this purpose the researcher visit each of the sampled school along with the questionnaire, observation from 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 school as included in the sample to fill the questionnaire freely. The researcher explained and clarified the confusions the arose in understanding the statements. The researcher also observed the class and records the information on the basis of set of observation from. Researcher also requested the teacher to fill on the questionnaire meant for the mathematics teacher. Researcher also used interview on the working field and recorded with cassette players.

Data Analysis Procedure

To determine the descriptive statistics (frequencies, percentages, Mean and standard deviation) of the learner questionnaires, teacher questionnaires and to compute the scores. The data generated from the use of the questionnaires would be analyzed using frequencies, percentages, mean and standard deviation to answer research questions.

To generate data in the study, a qualitative survey method was employed, which used in-depth interviews, classroom observations, post observation discussion, and document analysis, as tools for data collection. The survey method allowed in-depth investigation of the teachers' instructional practices and the beliefs and values underlying them (Merriam 1988). Thus the data upon which this article was based comes from transcripts of in-depth teachers' interviews with participants, classroom observations, post observation discussions, and instructional material used by the teachers (e.g., examination of text book content, activity sheets content, etc.). The criteria for decision of +ve, -ve statements were analyzed greater than or equal to 3 which is favorable, if the result comes to less than 3 then the statements were unfavorable.

In line with the research questions, two major categories were used to process the data: (1) teachers' views about conceptual learning of subject matter and the issues underlying it, with particular focused on Geometrical concepts prescribed in the curriculum at secondary level, and (2) the ways in which the teachers recognize the conceptual difficulties facing students in-depth learning of these concepts, how they go about helping students overcome those difficulties. Thus, as a result of content analysis, a range of themes emerged relating to teachers' beliefs about in-depth learning in mathematics the contexts that reveal challenges to conceptual learning, the nature of these challenges and teachers' effort was to help students overcome them. The emerging themes were compared across the four cases and cross-cutting key themes were identified, findings were formulated and key conclusions were drawn from further analysis and interpretation of these findings.

Chapter - IV

ANALYSIS AND INTERPRETATION OF DATA

The responses of the 150 students' from their questionnaire, face to face interview of 10 students, classroom observation of each 5 samples schools two times and the responses of interview with 5 teachers were used to analyzed data.

The data were collected for the study from five secondary schools selected five from urban and fiver from rural area schools of Sarlahi district. The obtained data were statistically analyzed and interpreted by using statistical tools mean weightage. The interaction with the respondents was recorded and noted carefully. The collected information was categorized according to the category of the respondents and then different themes were given in the context of interview considered as a code and the similar code versions of respondents together and explained in their perspective.

The mean weightage of every item of data was calculated area wise in various problems faced by the students related to teaching learning activities, teaching materials, techniques of proving and verifying theorems, evaluation techniques and classroom management. The collected data were analyzed under the following main heading which relates to the developed questionnaires and correspondents to the objectives of the study.

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. 1 shows the situation of problems related with instructional materials.

Table No. 1
Students Responses on Instructional Materials

S.N	Statements	SA	A	U	DA	SDA	MW	Remarks
1	Text books and practice books are available in time	30	34	4	4	78	3.9	Favorable
2	Our teacher uses locally available and low cost materials in teaching geometry	27	84	7	27	5	3.67	Favorable
3	Manipulative geometrical materials are not available in our school	66	52	7	9	16	3.96	Favorable
4	Less use of teaching materials	27	65	9	4	45	3.16	Favorable
5	Teacher uses instructional materials while teaching geometry	6	15	5	5	119	1.39	Unfavorable
	Total						3.21	Favorable

The analysis of Table No. 1 shows that total mean weightage of statement is 3.21 implies that students are facing problems on the field of instructional materials mean weightage of items 5 is 1.39 follows that students agreed only about availability of instructional materials but which are not sufficient for learning geometry. Items

numbers 1, 2, 3 and 4 have mean weightage 3.9, 3.67, 3.96 and 3.16 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, play wood 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 researcher discussion to the head teacher of every sampled school.

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.

“I am not using any fixed teaching method for geometrical teaching, but my aim is to how children receive the knowledge and children pass in the examination”

(Teacher view)

In this statements focus the teachers using teaching methods, teacher says he have no any fix teaching method for geometry teaching, his aim to how children receive the knowledge and pass the exam.

“There is large number of students in classroom, teaching period is short, to finish the course on time but that is impossible with child centered teaching” (Teacher view)

Here teacher says that he cannot apply child centered teaching method due to the large number of students in a classroom as well as he cannot finish course in time.

. *“Teacher always emphasis their own method and they also choose the lesson according to their will”* (Student)

Teacher use their own teaching method as well as he cannot agree with the students. He teaches those chapters first which he fell easy to teach.

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

Teacher give only the knowledge which in book, he cannot give extra knowledge related the books knowledge.

“Teacher does not use materials except geometry box and daily used materials at teaching” (Student)

Teacher cannot use more teaching materials except geometry box and daily used materials, so we cannot understood nicely.

“All the facilities of school depend of the economic status. We have crisis of economic. In future we hope to provide sufficient materials” (Head Teacher)

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 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. The above view of head teacher indicates there is a lack of financial resource.

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. There was unavailability of materials like video-recorder, micro computer, overhead projector, film projector and photo copies. 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.

Classroom Management

Educations have 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 avoid 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 No. 2.

Table No. 2

Students' Responses about classroom Management

S.N	Statements	SA	A	U	DA	SDA	MW	Remarks
6.	Problems of the text books are not related to the daily life of students	70	53	2	11	14	1.56	Un Favorable
7.	We have no any problems of	15	49	11	32	43	3.26	Favorable

	blackboard and other furniture in our classroom							
8.	We solve our mathematical	34	64	5	12	34	3.35	Favorable
9.	Anything written in whiteboard is visible	33	47	12	21	37	3.12	Favorable
10.	We feel difficulties while participating in the congested classroom	77	59	2	6	6	4.3	Favorable
	Total						3.12	Favorable

However, during the research period it had been found the students were disagreed about the classroom management in teacher geometry mean weightage of item 6 has 1.56 which follows that students agreed only about the whiteboard and furniture of the classroom but which are not sufficient for learning geometry. Item number 7, 8, 9 and 10 have mean weightage 3.26, 3.35, 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 whiteboard. The total problems in classroom management because of the overload of students in government schools.

The total given below was record from classroom observation related to the classroom management.

Table No. 3

Classroom Observation Records Related to Classroom Management

S.N.	Statement	Yes		No		Remarks
		NR	%	NR	%	
1.	The class is not crowded	4	80	1	20	

2.	Students have sufficient space to live	2	40	3	60	
3.	Arrangement of desk and benches are good	3	60	2	40	
4.	There was noise outside the classroom	4	80	1	20	
5.	Classroom are well lighted and ventilated	2	40	3	60	
6.	The class has good decoration	1	20	4	80	
7.	Whiteboard and furniture management are sufficient in classroom	3	60	2	40	

The Table No. 3 shows that there were too crowded. Similarly, classrooms were not properly arrangement. The classroom decoration was not properly managed and there was the problem of whiteboard, drinking water, playground and furniture. The maps, posters and other charts were not properly hanged. However, the classroom was well ventilated and lighted.

“School administrations do not provide good whiteboard and well classroom for the students, due to congested classroom there is no sufficient passage in the class. There is no provision of demonstrations table and separate classroom for weak students, but they are always passive and they do not participated in class activities which created the problem for the teachers” (Teacher)

By the analysis and interpretation of responses about the classroom management there were obtained some problems which were related to decoration

and proper arrangement of furniture, placement of whiteboard and its smoothness, size of classroom according as the number of students, alternative management for weak student. We should make good environment of the classroom to increase students learning capacity as well as students' ability. Classroom should be well furnished as well as good arrangement of desk and bench.

Teaching Learning Activities

Teaching activities play 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 learning activities are given below as:

Table 4

Students' Responses on Teaching Learning Activities

S.N.	Statements	SA	A	U	DA	SDA	Mean Weightage	Total
11.	The class starts from interesting way	40	77	13	19	1	3.90	Favorable
12.	Teacher gives extra parallel problems related with exercise	43	68	12	4	23	3.63	Favorable
13.	Teacher provide opportunity for weak students	15	49	11	32	43	4.19	Favorable
14.	The teacher also	53	59	7	19	12	3.82	Favorable

	participate with you in classroom activities							
15.	We do not feel difficult while providing theorem	30	86	13	21	-	4.01	Favorable
	Total						3.91	Favorable

From the detail study of the above table it is clear that there were problems in learning mathematics due to different level of learning capacity of students in the class. Most of the students were facing problems on the teaching learning activities. i.e. the total mean weightage of in favorable to the problems statements items 11, 12, 13, 14 and 15 have mean weightage more than three which implies that there were problems on teaching learning activities related to solving questions, in given exercises, proving theorems and teachers' participant in the classroom activities.

According to students, classes were not started interestingly. Students responded that the teacher didn't give the extra parallel problem of their ability. The weak students didn't get appropriate chance to learn clearly while the talent students didn't get the chance more to learn in the class. The teacher didn't participate with students in classroom activities. Some students responded that students feel difficult while proving theorem.

Similarly, the researcher observed ten mathematics classes to collect some information about teaching learning activities. The class observation records related to teaching learning activities are given below:

Table No. 5**Class observation Records to Teaching/learning Activities**

S.N.	Statement	Yes		No		Remarks
1.	The teacher moves in classroom	3	30	7	70	
2.	Teacher provided clear instruction for new concepts.	4	40	6	60	
3.	All students involved in all activities.	2	20	8	80	
4.	Sufficient examples provides for new concepts.	3	30	7	70	
5.	Teachers encourage all students.	4	40	6	60	
6.	Teacher solves problems.	6	60	4	40	
7.	Teacher shows positive behavior on difficult question.	3	30	7	70	
8.	Teacher has good command over subject matter.	8	80	2	20	
9.	Teacher provides opportunity for weak students.	7	70	3	30	

From the 10 classes observation the researcher concluded that some classes are not good. The movement of the teacher had not seen six classes. Teacher did not give the clear concept in the seven classes' observation the teacher did not care to all students in the classroom. The teacher did not provide good opportunity for weak students. Six classes observation out of ten, it was seen that the teacher had not good command over the subject matter.

Interaction with the teachers and students problems related to teaching and learning activities in the classroom were follows:

- It was very difficult to prepare and implemented the lesson plan.
- More emphasis should be given to finish the course rather students' learning.
- To motive students towards learning mathematics was very difficult.
- Class control and students motivation was the difficult task for the teacher.

Weakness of the students and the teachers faced difficulty in teaching which further leads to slow speed of teaching. The different category of students and their negligence towards mathematics created problems in teaching.

It was generally agreed that students in schools differ in the learning ability of mathematics due to the various background such as age, maturity and socio-economic status.

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) noted 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 beleved that writing and that many students need to have more experiences in thinking at lower level before learning formal geometric concepts.

Table No. 6 illustrates the student's responses on problems of proving and verifying theorems and construction.

Table No. 6**Proving and Verifying Theorems and Construction**

S.N.	Statements	SA	A	U	DA	SDA	MW	Remarks
16.	Teaching materials are used in teaching theorems and exercises.	6	15	5	5	119	4.16	Favorable
17.	Our teacher uses geometrical instruments while teaching construction.	34	56	4	7	49	3.12	Favorable
18.	Geometrical theorems of secondary level related with life.	41	87	5	17	-	1.08	Un Favorable
19.	Examples and exercises of theorems are highly correlated	45	90	5	17	-	4.13	Favorable
	Total						3.85	Favorable

Inspection of the table reveals that the total mean weightage is 3.85, means maximum number of students are in the favor of the problems and signify the problems. Process of proving ideas are highly based on theoretical and parrot learning system which does not catch up the Van Hiele's five levels of geometrical thought. Teaching construction and verifying the theorems are less priority in maximum schools. Using the weightage of No. 16, 17 and 19 claims that most of the students are facing problems when proving theorems and construction.

For the justification the above quantitative result researcher did interaction to the students and teacher which is given below:

“I am not using any fixed teaching method for geometrical teaching, but my aim is to how children receive the knowledge and children pass in the examination”

(Teacher view)

In this statements focus the teachers using teaching methods, teacher says he have no any fix teaching method for geometry teaching, his aim to how children receive the knowledge and pass the exam.

“There is large number of students in classroom, teaching period is short, to finish the course on time but that is impossible with child centered teaching” (Teacher view)

Here teacher says that he cannot apply child centered teaching method due to the large number of students in a classroom as well as he cannot finish course in time.

“Teacher always emphasis their own method and they also choose the lesson according to their will”

(Student)

Teacher use their own teaching method as well as he cannot agree with the students. He teaches those chapters first which he fell easy to teach.

“Teacher always emphasis on bookish knowledge and not give many examples for concept in mathematics classroom”.

(Student)

Teacher give only the knowledge which in book, he cannot give extra knowledge related the books knowledge.

“Teacher does not use materials except geometry box and daily used materials at teaching”

(Student)

Teacher cannot use more teaching materials except geometry box and daily used materials, so we cannot understand nicely.

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 activities such as did not give many examples and did not try to manage extra mathematical activities.

Evaluation Techniques

The primary responsibility of a teacher is to using about the maximum degree of students achievement in learning. Evaluative devices 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 techniques.

Table No. 7

Students Responses on Evaluation Techniques

S.N.	Statements	SA	A	U	DA	SDA	MW	Remarks
20.	The teacher checks our homework daily	48	90	4	5	3	4.16	Favorable
21.	The teacher takes different types of test except terminal exam	15	31	3	24	77	3.94	Favorable
22.	Our teacher takes different types of test except terminal exam	19	40	10	14	67	2.53	Un Favorable
23.	Teaching is only exam oriented	28	48	10	24	40	3.00	Favorable

24.	The teachers do not focus on our creativity and curiosity	24	70	5	32	19	3.32	Favorable
25.	Contents in the given text book are related to lower classes	44	57	2	5	2	4.37	Favorable
26.	Teachers give the feedback	57	79	7	5	2	4.37	Favorable
27.	All geometrical problems aren't included in exam	70	58	6	13	3	2.57	Un Favorable
28.	The first priority is nor given to teach geometry	55	59	4	28	4	2.07	Un Favorable
	Total						3.03	Favorable

The total mean weightage 3.03 indicates the most students are in favor of the problems of evaluation techniques. During research and analysis of Table No. 6. It had been found that most of students especially in items 23, 24, 25, 26 with mean weightage 4.16, 3.94, 2.53, 3.32 and 4.37 respectively are in favor of the problems. The items 22, 27, 28 with mean weightage 2.53, 2.57 and 2.07 respectively are not favor of the problems of evaluation techniques. Students agreed about the unit tests, terminal tests, problems in exam of geometry and given priority in teaching geometry.

From the view of 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.

The entire teacher involved in the study replied that there is a problem in daily homework checking due to the large number of students in the class and overload of teachers and more attention towards students.

To justify the above result the researcher used interview schedule related to the students which are given below:

Do you feel Geometry as hard subject? And why?

“Yes, I am felling mathematics is hard subject but in lower level my favorite subject was math. Now a day I don’t get sufficient time to practice mathematics so I feel it is hard.”

(Ghanshyam Mahato)

Here the student says that in lower class his favorite subject was mathematics but now a day his difficult subject is mathematics, because he can’t practice more time.

“Yes, I feel geometry is a hard subject because I must engage in household work like carrying water, making, food, cutting grass etc. These works or daily routine”.

(Naresh Subedi)

Here the students feel geometry hard because he has not sufficient time to practice this subject.

“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”.

(Ramesh Shah)

In this statements refers to the students own self not giving time to practice mathematics he give more time to playing and other activities.

“Yes, I am also feeling that Geometry is the hardest subject because of my pre-knowledge and teacher does not care us he used to forward lesson according to talent students only” (Rakesh Gupta)

Here student have not understood what the teacher each because less student forget what he learn in junior class and teacher does not support the poor students.

“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” (Samriti K.C)

This statements refers to the distance between students and school is not comfort student give more time arrival and departure. And teacher does not check homework daily, he neglect the students creativity and curiosity. Also teacher have give pre knowledge.

“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 methods. He also follows the summative evaluation system and he is unknown about the using and constructing the local teacher materials.” (Keshav Mahato)

Here students feel geometry hard due to the teacher never used the teaching materials and he always used lecture methods, also he does not take exam time to time.

“I also feel geometry as an interesting and easy subject. But some time if teacher does not give clear concept in proving and verifying the geometry theorems then I used to feel lazy” (Dipika Yadav)

This statements refers to giving clear concept to the lesson, in class teacher direct start to teaching without giving clear concept in proving and verifying the geometry. So, student feels hard to learn.

“I am felling mathematics as interesting and easy subject among all other subject because if we know the process and formula we can solve the problems easily”

(Amrita Pandey)

Here students feel easy to learn mathematics if he know the process and formula which is used in the lesson.

Study other problems related to evaluation techniques 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 comers 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 he have a little time saving from household works.

Long distance comes 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.

Analysis and Interpretation of Teacher's Responses

Ten questions were included in questionnaire for five teacher's related problems in teaching geometry at secondary level. These questionnaires were related to text book, subject matter, instructional materials and evaluation techniques and so on. The collected response were categorized in few columns and calculated by percent. The collected responses are shown in the table No. 8.

Table No. 8

Analysis and Interpretation of Teacher's Responses

S.N.	Statements	Yes		No		Remark
		NR	%	NR	%	
1.	Are the subject matters included in the text book is the high sprit of curriculum	3	60	2	40	
2.	Are the subject matters appropriate with the level of students	4	80	1	20	
3.	Are you satisfied with your job?	2	40	3	60	

4.	Are examples and exercises correlated or not?	1	20	4	80	
5.	Are the teacher training sufficient? If not what typed of training do you need?	2	40	3	60	
6.	Are teacher's guide and other journals available in your school?	2	40	3	60	
7.	Do you encourage students to use materials in solving of problems?	4	80	1	20	
8.	Are there any obstacles to make and collect local teaching materials in teaching mathematics?	1	20	4	80	
9.	There are fewer environments except third terminal exam through there are other means of evaluation system.	3	60	2	40	
10.	Are their exercises in the textbook, can solving the daily life mathematical problems?	1	20	4	80	

According to the table following out comes may be cussed about problems of teaching activities.

According to the statement 1, sixty percent teachers are supported to the statement and only forty percent teachers are against it. It meant the subject matter included in the textbook has high spirit of curriculum. Eighty percent teachers are supported to the statements and twenty percent teachers are not favor to the statement. It meant the teachers responses were not in the favor of problem on the subject matter. Forty percent teachers were satisfied with their job and only Sixty percent were dissatisfied with their job and they were feeling burden in teachers' job. From the above table, it was found that twenty percent teachers were agreed to the statement and eighty percent were against to it. It meant there are problems between the relation of examples and exercises. From this study. It is found that teacher training is not sufficient. Most of the teachers were untrained. Forty percent teachers were supported the statement and sixty percent were not supported to the statement. Also most of teachers demanded for refresher training according as changing curriculum and some teachers were fully untrained although they were teaching mathematics since last one decade. From the above study found that textbook was available in school rarely but except this other references books and required material were not available in schools. Responses percent is also indicated. According to the teachers responses they encouraged to the students for using teaching materials while solving the mathematical problems. Most of teachers accepted that there arose problems in making collecting local teaching materials. Teaching period were overloaded and no time for collecting and using locally available materials. Eighty percent teachers were supported to the annual examination and twenty percent teachers appear to the support of unit test. They gave more importance to the half annual and annual examination than unit test. At last only twenty percent teachers were favor to the statement and

eighty percent were not favor to the statement. It meant there were great problems in the subject matters which included in the textbook of mathematics.

Researcher tries to justify the teacher's responses that are in numerical status by using interview schedule.

What kinds of problems do you face in your professional life?

"I know it is my duty to diagnose each child's exact deficiencies and treat them according to their needs to improve mathematical achievement. Also I know that local teaching materials are more useful to teach geometry to the students. But it is impossible to me because of the overcrowded classroom, over load of periods upon me, short time of per periods and no any evaluation for extra labor." (Teacher)

This shows that teacher did not want to do extra labor in the classroom to improve mathematical achievement.

"I do not get teacher training so I am unable to apply effective method of teaching and learning." (Teacher)

The above view of teacher shows that there is need of teacher training to make effective teaching learning activities.

"If I provide long time for class work taking weak student into mind, it is impossible for me to complete the course in one academic year. If I don't complete the course, it will be injustice for the good students." (Teacher view)

Although the teacher provided home work to the students every, but checked the home of a few students only randomly.

Chapter - V

SUMMARY, FINDING CONCLUSION AND IMPLICATION

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

Summary

The main purpose of the study was to identify the problems faced the mathematics students in geometry at secondary level in Sarlahi district. The specific objectives of the study were; the problems related to teaching learning activities, the problems related to the students' evaluation techniques, the problems faced by urban learning geometry at secondary level, some measures for the solution of the problems.

For further convenience of the study the problems were categorized into different five areas viz. teaching learning activities, instructional materials, proving and verifying theories, classroom management and evaluation techniques.

This study was entirely survey type. The population of this study consisted of entire mathematics students, teachers of government school situated in both urban and rule of Sarlahi district. The researcher himself developed the questionnaire, observation form and interview schedule under the guidance of supervisor and researcher added some problems himself with advice of experienced mathematics teacher. The questionnaire, observation form and interview schedule were tools of study. The responses were collected from different students and teachers selected from simple random sampling method. The collected data were quantified based on Likert five point scales. Questionnaire, observation from and interview schedule were included in each category of problems and descriptive analysis of collected responses was carried out. Statistical indicators such as mean weightage 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 of Geometry teaching in the classroom at secondary level. Different types of internal and external factors and external factors are affecting to arise these problems.

Problems related to Teaching Learning Activities

Misconception of students to mathematics as a hard subject has become a problem students are found not be laborious. Hence, there also great problems from student side. More on discipline problems some time arose from students' side. There are problems on finishing the lessons of textbook due to the untrained teachers and lack of monitoring part from school administration.

-) Problems on solving parallel problems related with exercise due to the large number of students and time boundary.
-) Problems on teacher guidance for solving problems.
-) Due to the lack of sufficient time, there were difficulties in checking homework.
-) Besides problem related to good performance of teacher, lack of guiding encouragement, motivation etc are equally problematic.
-) Regarding the problems of teaching method and technique, there sums to be confusion in selecting appropriate teaching methods. Lack of time to use various methods.
-) Lack of time to use various methods, lesson plan and appropriate examples to make clear concept of its difficulties.
-) There arose the problems in class evaluation system.

Problems related to Instructional Materials

From this study, researcher found the some problems related to instructional materials which are given below:

-) Problems related with textbooks and other reference books due to the difficulties of transportation and remoteness and also the some error into the textbook.
-) School had a few quality teaching materials but there was no facility to store and place rightly.
-) Time factor hinder uses of instructional materials due to short time period of mathematics have not been because of large number of class size.
-) Problems on construction and using locally available and low cost materials in teaching geometry.
-) There was economic crisis in schools therefore; school could not manage the proper environment of teaching learning

Problems related to Proving and Verifying Theorems and Construction

From this study, researcher found the some problems related to Proving and Verifying Theorems and Construction which are given below:

-) Problems on using geometrical instruments in teaching construction.
-) There was the problem that related to the theoretical and practical concept of proving theorem.
-) Most of the teachers were not able to teach their students in the basis of Van Hieles five levels of thought of geometry.
-) Problems on using materials in teaching theorems and exercises.
-) Teacher was unknown about the current teaching methods and implication of it.

Problems related to Classroom Management

From this study, researcher found the some problems related to Classroom Management which are given below:

-) It was problems of managing the weak students in the classroom teaching learning.
-) It was difficult to demonstrate and use the teaching materials because of the lack of space in classroom.
-) There was problem related to decoration of classroom and proper arrangement of furniture.
-) There was problem of placement and smoothness of whiteboard.
-) The teacher was not able to manage the students due to the small size of classroom.

Problems related to Evaluation Techniques

From this study, researcher found the some problems related to Evaluation Techniques which are given below:

-) There was problem related to evaluation of classroom activities.
-) Daily homework correction was impossible due to the large class size and over work load of teacher.
-) Maximum teachers claimed that there was not a connection between the classroom evaluation and final evaluation of the students. It indicated that the poor students could also pass the examination.
-) There was problem on fulfillment of student's creativity and curiosity.
-) There was a problem of utilization of time by students before and after the school time.

Conclusion

From the above stated findings of this study, it can be concluded that Teaching and learning of geometry was not satisfactory in Sarlahi district. And there had been significant problems in teaching learning activities, instructional materials, theorems and construction, classroom management and evaluation technique. On the basis of findings of the study, researcher concluded that: There were not sufficient materials for learning geometry. So students feel difficulties. Due to the few interactive classrooms, students feel difficulties in the learning geometry. Students had not basic concept of geometry. The teacher had not clear concept about lesson of geometry. So it created more confusion about the problems of geometry. The teacher used lecture method in the classroom. So students were passive. They were very confusion about the problems of geometry. They wanted to ask some questions but the teacher didn't give any opportunity to ask questions. So they feel learning problems in geometry. It was difficult to create interest on students because geometry was regarded as an abstract subject matter.

Recommendations

Observing the above study, the researcher has presented the recommendation which will be benefited to the concerned authority for further improvement in the geometry teaching. The problems aroused in teaching learning activities, instructional materials and evaluation system.

-) The contents and methods of teaching should be influenced by some practical motives.
-) Using of lesson plans should be encouraged.

-) Government of Nepal should supply the essential teaching materials and should encourage the school administration to purchase such teaching materials.
-) Teacher should be encouraged for making and using the teaching materials.
-) Evaluation system should be more precise and scientific.
-) The teacher should motivate the weak students and praise them to participate in teaching learning activities
-) The demonstration materials should be fit the classroom size and situation.
-) School need t to make mathematics laboratory.
-) 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.

Implication

This present study may not be completed for all situations 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 be done in other districts of Nepal 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 conferences.

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APPENDIX A**INTERVIEW SCHEDULE WITH HEAD TEACHERS**

Name:

Qualification:

School Name:

Address:

The interview with the head teacher on the basis of following topics:

- Z School environment in the learning
- Z Physical facilities in the school
- Z Available of teaching materials
- Z Special classes for students

APPENDIX B**INTERVIEW SCHEDULE WITH MATHEMATICS TEACHERS**

Name:

Schools' Name:

Qualification:

Teaching Subject:

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

- Z Participation of the students in the classroom
- Z Participation on individual/group
- Z Encouragement of the students in learning geometry
- Z Teaching methods in geometry
- Z Problems of students in geometry
- Z Relation between teacher and students
- Z Impact of age and school environment in teaching geometry
- Z Cause of learning problems in geometry

APPENDIX C**INTERVIEW SCHEDULE WITH STUDENTS**

Name:

Schools' Name:

The interview with the student on the basis of following topics:

- Z Environment at school for learning
- Z Teaching techniques of mathematics teacher in geometry class
- Z Participation in the classroom
- Z Problems in geometry
- Z Basis knowledge about geometry
- Z Cause of learning problems in geometry
- Z Evaluation techniques used by teacher
- Z Teaching materials used by mathematics teachers

APPENDIX D**CLASS OBSERVATION FORM**

Name of Teacher:

Name and Address of School:

Subject:

Number of Student in Class:

Date:

1. Learning environment at school

.....

2. Students and teachers activities in classroom

.....

3. Pre knowledge of students

.....

4. Teaching methods used on teaching geometry

.....

5. Materials and Evaluation techniques in teaching geometry

.....

6. Class work and homework copy of geometry chapter

.....

7. Coordination with peers and teacher to solve the problems

.....

APPENDIX E

Questionnaire

Students Responses on Instructional Materials

S.N	Statements	SA	A	U	DA	SDA	MW	Remarks
1	Text books and practice books are available in time							
2	Our teacher uses locally available and low cost materials in teaching geometry							
3	Manipulative geometrical materials are not available in our school							
4	Less use of teaching materials							
5	Teacher uses instructional materials while teaching geometry							
	Total							

Students' Responses about classroom Management

S.N	Statements	SA	A	U	DA	SDA	MW	Remarks
6.	Problems of the text books are not related to the daily life of students							
7.	We have no any problems of							

	blackboard and other furniture in our classroom							
8.	We solve our mathematical							
9.	Anything written in whiteboard is visible							
10.	We feel difficulties while participating in the congested classroom							

Students' Responses on Teaching Learning Activities

S.N.	Statements	SA	A	U	DA	SDA	Mean Weightage	Total
11.	The class starts from interesting way							
12.	Teacher gives extra parallel problems related with exercise							
13.	Teacher provide opportunity for weak students							
14.	The teacher also participate with you in classroom							

	activities							
15.	We do not feel difficult while providing theorem							

Proving and Verifying Theorems and Construction

S.N.	Statements	SA	A	U	DA	SDA	MW	Remarks
16.	Teaching materials are used in teaching theorems and exercises.							
17.	Our teacher uses geometrical instruments while teaching construction.							
18.	Geometrical theorems of secondary level related with life.							
19.	Examples and exercises of theorems are highly correlated							
	Total							

Students Responses on Evaluation Techniques

S.N.	Statements	SA	A	U	DA	SDA	MW	Remarks
20.	The teacher checks our homework daily							

21.	The teacher takes different types of test except terminal exam							
22.	Our teacher takes different types of test except terminal exam							
23.	Teaching is only exam oriented							
24.	The teachers do not focus on our creativity and curiosity							
25.	Contents in the given text book are related to lower classes							
26.	Teachers give the feedback							
27.	All geometrical problems aren't included in exam							
28.	The first priority is not given to teach geometry							
	Total							

Classroom Observation Records Related to Classroom Management

S.N.	Statement	Yes		No		Remarks
		NR	%	NR	%	
1.	The class is not crowded					
2.	Students have sufficient space to live					
3.	Arrangement of desk and benches are good					
4.	There was noise outside the classroom					
5.	Classroom are well lighted and ventilated					
6.	The class has good decoration					
7.	Whiteboard and furniture management are sufficient in classroom					

Class observation Records to Teaching/learning Activities

S.N.	Statement	Yes		No		Remarks
1.	The teacher moves in classroom					
2.	Teacher provided clear instruction for new concepts.					
3.	All students involved in all activities.					
4.	Sufficient examples provides for new concepts.					

5.	Teachers encourage all students.					
6.	Teacher solves problems.					
7.	Teacher shows positive behavior on difficult question.					
8.	Teacher has good command over subject matter.					
9.	Teacher provides opportunity for weak students.					

Analysis and Interpretation of Teacher's Responses

S.N.	Statements	Yes		No		Remark
		NR	%	NR	%	
1.	Are the subject matters included in the text book is the high spirit of curriculum					
2.	Are the subject matters appropriate with the level of students					
3.	Are you satisfied with your job?					
4.	Are examples and exercises correlated or not?					
5.	Are the teacher training sufficient? If not what typed of training do you need?					
6.	Are teacher's guide and other journals available in your school?					

7.	Do you encourage students to use materials in solving of problems?					
8.	Are there any obstacles to make and collect local teaching materials in teaching mathematics?					
9.	There are fewer environments except third terminal exam through there are other means of evaluation system.					
10.	Are their exercises in the textbook, can solving the daily life mathematical problems?					

APENDEX F

Table No. 1

Students Responses on Instructional Materials

S.N	Statements	SA	A	U	DA	SDA	MW	Remarks
1	Text books and practice books are available in time	30	34	4	4	78	3.9	Favorable
2	Our teacher uses locally available and low cost materials in teaching geometry	27	84	7	27	5	3.67	Favorable
3	Manipulative geometrical materials are not available in our school	66	52	7	9	16	3.96	Favorable
4	Less use of teaching materials	27	65	9	4	45	3.16	Favorable
5	Teacher uses instructional materials while teaching geometry	6	15	5	5	119	1.39	Favorable
	Total						3.21	Favorable

Table No. 2**Students' Responses about classroom Management**

S.N	Statements	SA	A	U	DA	SDA	MW	Remarks
6.	Problems of the text books are not related to the daily life of students	70	53	2	11	14	1.56	Un Favorable
7.	We have no any problems of blackboard and other furniture in our classroom	15	49	11	32	43	3.26	Favorable
8.	We solve our mathematical	34	64	5	12	34	3.35	Favorable
9.	Anything written in whiteboard is visible	33	47	12	21	37	3.12	Favorable
10.	We feel difficulties while participating in the congested classroom	77	59	2	6	6	4.3	Favorable
	Total						3.12	Favorable

Table No. 3**Classroom Observation Records Related to Classroom Management**

S.N.	Statement	Yes		No		Remarks
		NR	%	NR	%	
1.	The class is not crowded	4	80	1	20	
2.	Students have sufficient space to live	2	40	3	60	
3.	Arrangement of desk and benches are good	3	60	2	40	
4.	There was noise outside the classroom	4	80	1	20	
5.	Classrooms are well lighted and ventilated	2	40	3	60	
6.	The class has good decoration	1	20	4	80	
7.	Whiteboard and furniture management are sufficient in classroom	3	60	2	40	

Table 4
Students' Responses on Teaching Learning Activities

S.N.	Statements	SA	A	U	DA	SDA	Mean Weightage	Total
11.	The class starts from interesting way	40	77	13	19	1	3.90	Favorable
12.	Teacher gives extra parallel problems related with exercise	43	68	12	4	23	3.63	Favorable
13.	Teacher provide opportunity for weak students	15	49	11	32	43	4.19	Favorable
14.	The teacher also participate with you in classroom activities	53	59	7	19	12	3.82	Favorable
15.	We do not feel difficult while providing theorem	30	86	13	21	-	4.01	Favorable
	Total						3.91	Favorable

Table No. 5**Class observation Records to Teaching/learning Activities**

S.N.	Statement	Yes		No		Remarks
1.	The teacher moves in classroom	3	30	7	70	
2.	Teacher provided clear instruction for new concepts.	4	40	6	60	
3.	All students involved in all activities.	2	20	8	80	
4.	Sufficient examples provides for new concepts.	3	30	7	70	
5.	Teachers encourage all students.	4	40	6	60	
6.	Teacher solves problems.	6	60	4	40	
7.	Teacher shows positive behavior on difficult question.	3	30	7	70	
8.	Teacher has good command over subject matter.	8	80	2	20	
9.	Teacher provides opportunity for weak students.	7	70	3	30	

Table No. 6**Proving and Verifying Theorems and Construction**

S.N.	Statements	SA	A	U	DA	SDA	MW	Remarks
16.	Teaching materials are used in teaching theorems and exercises.	6	15	5	5	119	4.16	Favorable
17.	Our teacher uses geometrical instruments while teaching construction.	34	56	4	7	49	3.12	Favorable
18.	Geometrical theorems of secondary level related with life.	41	87	5	17	-	1.08	Un Favorable
19.	Examples and exercises of theorems are highly correlated	45	90	5	17	-	4.13	Favorable
	Total						3.85	Favorable

Table No. 7**Students Responses on Evaluation Techniques**

S.N.	Statements	SA	A	U	DA	SDA	MW	Remarks
20.	The teacher checks our homework daily	48	90	4	5	3	4.16	Favorable
21.	The teacher takes different types of test except terminal exam	15	31	3	24	77	3.94	Favorable
22.	Our teacher takes different types of test except terminal exam	19	40	10	14	67	2.53	Un Favorable
23.	Teaching is only exam oriented	28	48	10	24	40	3.00	Favorable
24.	The teachers do not focus on our creativity and curiosity	24	70	5	32	19	3.32	Favorable
25.	Contents in the given text book are related to lower classes	44	57	2	5	2	4.37	Favorable
26.	Teachers give the feedback	57	79	7	5	2	4.37	Favorable
27.	All geometrical problems aren't included in exam	70	58	6	13	3	2.57	Un Favorable
28.	The first priority is nor given to teach geometry	55	59	4	28	4	2.07	Un Favorable
	Total						3.03	Favorable

Table No. 8**Analysis and Interpretation of Teacher's Responses**

S.N.	Statements	Yes		No		Remark
		NR	%	NR	%	
1.	Are the subject matters included in the text book is the high spirit of curriculum	3	60	2	40	
2.	Are the subject matters appropriate with the level of students	4	80	1	20	
3.	Are you satisfied with your job?	2	40	3	60	
4.	Are examples and exercises correlated or not?	1	20	4	80	
5.	Are the teacher training sufficient? If not what typed of training do you need?	2	40	3	60	
6.	Are teacher's guide and other journals available in your school?	2	40	3	60	
7.	Do you encourage students to use materials in solving of problems?	4	80	1	20	
8.	Are there any obstacles to make and collect local teaching materials in teaching	1	20	4	80	

	mathematics?					
9.	There are fewer environments except third terminal exam through there are other means of evaluation system.	3	60	2	40	
10.	Are their exercises in the textbook, can solving the daily life mathematical problems?	1	20	4	80	

APPENDIX G

Sample of Schools

S.N.	Name of Schools	Location	Rural/ Urban
1.	Shree Chakra Janata Higher secondary School,	Barahachawa - 4, Sarlahi	Rural
2.	Shree Janata higher secondary School	Somti Bazar, Rajghat - 6	Rural
3.	Shree Nawa Jana Jagaran Higher Secodary School	Shankarpur - 4	Rural
4.	Shree Janata Ma.Vi.	Padariya-3	Urban
5.	Shree Gamuniya Madanpur Bingara Higher Secondary School.	Madanpur-5	Urban
6.	Shree Mahendra Ratna Jagannath Laxminiya Ma.Vi.	Murtiya - 6	Urban
7.	Shree Mukteswor Ganesh Ram Sarit Ga. higher secondary School.	Murtiya - 3	Rural
8.	Shree Pancha Kumar Secondary School.	Hajarbigha Sarlahi	Urban
9.	Shree Sarswoti Higher Secondary	Hajriya - 5	Rural
10.	Shree Janaki Dash Janata Higher Secondary School.	Hempur - 6	Urban

APPENDIX H

Sample Teachers Profile

S.N.	Name of Teachers	Age	Experience	Trained/ Untrained
1.	Pramod Jha	40	15	Trained
2.	Devi DattaYadav	50	18	Trained
3.	Hemlal Ray	31	4	Trained
4.	Sanjaya Ram	32	5	Trained
5.	Ranjeet Kumar Yadav	30	8	Trained