CHAPTER-1

INTRODUCTION

1.1 Background of the study

Mathematics has been developed from the beginning of human civilization. It is not only a subject of formal education but also the body structure of every needs of human life. Its development and significance is related to the physical world and mankind. If we turn to the historical background of Mathematics, Pre-Historic and historic people used its concept for their daily needs. Many oriental Literature also reveals that Mathematics originated from practical Experiences. From the evidence of mahanjo-dado at about 3000 B.C., It can be said that it was used in building bricks, houses, temples, bridges, different handicrafts, planned cities and it supported to live a highly organized life. As a result, early mathematics has a practical basis for its development and such a basis arose with the advent of more advanced form of society. As for Example, some of the great rivers of Africa and Asia namely. The nile in Africa, The tigris and Euphrates in western Asia, The Indus and the Ganges in south Central Asia and the Hwang Ho and the Yangtze in eastern Asia that the societies made their new appearances. These rivers provided convenient transportation, irrigation and with marsh Drainage at the premitive period. At the same time, some projects were imphemented in Engeenering, Financing and administrative sectors and developed considerable technical knowledge on the basis of Mathematics. Somilarly mathematics was used on cannal and reservoir construction for parceling land, In the process of Gathening crops, storing and apportioning of foods, evaluation of financial and commercial practices for raising and collecting taxes and in the field of Trade.

Thus, early mathematics can be said they have originated in certain areas in the ancient period as a practical science.

Regarding the context of development of Mathematics, carl. B. Boyer states in the pointrs as:

"At one time Mathematics was thought to be directly concerned with the world of our sense experiences and it was only in the nineteenth century that pure

mathematics freed itself from limitations suggested by observations of nature. It is clear that originally mathematics arose as a part of the everybody life of man."

In slow and continuous development of human civilization, Mathematics began as a popular and most important subject for their intellectual as well as practical activities. So, it is given the signification place in curriculum from the beginning of educational institution in our world. In our country, also it has been given the significant place in curriculum for all levels of school education since the introduction of National Education system plan. (1971-1976)

As mentioned above, basically the mathematics is closely related with practical life. This implies that it is not only a subject for formal schooling but related to every activities of human being. So its area is not bounded but has been adding several new concepts with the evolution of human society. Now, it is being the composition of different branches of mathematical concepts out of such branches of mathematics, Geometry is the most important and classical concept. Besides, this, it is one of the oldest intellectual persuits of mankind. Its origin can be traced back to the early Babylonians and Egyptians, for whom Geometry was Essentially an Emperical science cultivated slowly for its utility. This utility has to do with the part of practical measurement. Indeed the world 'Geometry' Literally means "Measurement of earth" In this regard, Kelly and ladd (1969) stated as:

"The basic idea of mathematical system of was originated in Geometry some twenty two or twenty three hundred years ago How ever. The modern way of viewing such systems has a long and slow development. It is not surprising that some knowledge about physical or practical Geometry Existed Even in every ancient civilization:

Regarding the context of origin of Geometry, "Modern maths "states, the concept of geometry is not a new one. Early Egyptians, Greeks, Babylonians and Romans were Familiarly with this subject. They used this subject practically in their different works but they did not know that this subject as Geometry"

With these evidences it can be claimed that the ancient cultures of Babylon and Egypt are usually credited with the first attempt at shaping them. Geometry at that

time was practical and Empirical in Nature. General theories, postulates and proofs came much later and completed history of development of Geometry is not yet know.

Geometry is an Essential part of the study of mathematics at any level and a vital catalyst for effective use of study of any branch of mathematics. So, prospective Secondary school teachers need a broad preparation in Geometry since they will them selves be Expected to provide broad preparation for their own students.

In compulsory and optional mathematics, there we have many chapter related with Geometry. Such as Transformation, co-ordinate, Trignometry etc. Student feel hard to do geometry portion rather than other topic.

It is common public opinion that male students have better attitudes than female students. Urban students are better than rural students: Similarly private school' students are better than Comminuty Schools' students; Most of the failiure students have no General concerts in Geometry and the passed students have low manes in it, also it is a public opinion. Then the problem of academic failure presents a great challenge before the educations professional and others working in the field of mathematics education. In the past four decades, researchers have shown considerable interest in the causes responsible for failiure.

'Students' failiure in learning Geometry with the under standing and mastery of the Geometrical concept may be attributed to several factors including their own attitude towards Geometry. Thus in present study, Focus has been laid on investigating the attitnde of students towards Geometry. It is assumed that such a study might be useful from educational point of view.

1.2 Statement of the problem

In context of Nepal, Particularly in the Sunsari District of eastern Nepal. There is dearth lake of studies pertaining to the attitude of students in Geometry. There fore, as mentioned in section 1.1, The prime concern of the prposed study is to Explore the attitude of Xth Grade students in Geometry in this subject in Dharan research centre.

In other words, the study aims at answering the following questions:

1. Do the Xth Grade boys have better attitude than girls in an attitude test in Geometry ?

2. Do the Xth Grade private school's students have better attitude than Comminuty Schools' students in an attitude test in Geometry ?

3. Do the urban schools' students have better attitude than rural schools' students in an attitude test in Geometry.

1.3 Objectives of the study

The study will aim at find out the attitude of 10th Grade students towards Geometry.

Thus, This study will intend to accomplish the following objectives:

1. To, identify the attitude of status x^{th} Grade boys and girls towards Geometry.

2. To identify the attitude states of xth Grade Urban and Rural areas students towards Geometry.

3. To, identify the attitude status of Institutional and community school students attitude towards Geometry.

1.4 Significance of the study

The study will provide information about the status of attitude of Xth Grade students in Geometry. Who are studying in private and Comminuty Schools, in Urban and rural schools. It will also provides the information of male and female students' status about attitude in Geometry. This study will provide information to the teachers, curriculum planners, educationists, administrators, and other concerned personnel to consider this in their work related to it. Mainly the significance of this study are as follows:

This study will help to know the attitude of Xth Grade boys and girls towards Geometry. To Know the attitude of Xth Grade Urban and rural areas students towards Geometry. To know the attitude status of Institutional and community school students attitude towards Geometry.

1. It will help to planner, administrators, educators etc. by indicating where the improrements are needed for closing the Gaps between different group of students.

2. It will help to reduce regional and Gender wise variation in attitude in Geometry.

3. It will help in planning the remedial educational strategies for these students to correct the wrong impression about the study of Geometry.

4. It will be helpful to improve the Geometry section of secondary level curriculum.

1.5 Research hypothesis

With a view to reach at definite conclusions about the problems stated earlier. The following set of research hypotheses will be subjected to Empirical verification.

1. There is no significant difference between the attitude status of boys and Girls towards Geometry.

2. There is no significant difference between the attitude status of Urban and rural areas school's students attitude towards Geometry.

3. There is no significant difference between the attitude status of Institutional and community school students attitude towards Geometry.

1.6 Delimitation of the study

This study will be delimited in Dharan Resources centre. Including Dharan municipality and Panwara VDC.

1. This study will be restricted to X^{th} Grade students attitude in Geometry.

2. This study will be it limited to Geometry portion of X Grade Compulsory Mathematics.

3. The study will be limited to a small sample of schools (5 Government and 3 bording) situated in Urban and rural areas. The sample will be choosed (50 boys and 50 girls) 100 students studying in those schools.

4. This study will be restricted for the attitude of students in the area of studying habits, doing home work instructional material and importance of Geometry.

5. Only the co-educational schools will be included in the study.

1.7 Definition of Terms used

A predisposition or a Tendency to respond positively or negatively towards a certain idea, object, person or situation, attitude influences an individuals choice of action and responses to challanges, incentives and rewards.

In phychology it is defined as a learned tendency to evaluate things in a certain way. This can include evaluations of people, issues, objects or events. Such evaluations are often positive or Negative, but they can also be uncertain at times.

Attitude can also be explicit and implicit. Explicit attitudes are those that we are consiously aware of and that clearly influence our behaviours and beliefs. Implicit attitude are unconcious, but still have an effect on our beliefs and behaviours.

The terms which will be used or which is used in the present study be defined as follows:

Attitude : According to the dictionary of education Attitude is :

"A state of mental and Emotional readiness to react to situation, persons or things in a manner in harmony with a habitual pattern of response previously conditioned to associate with these stimuli."

Sidhu : K.S. has described the attitude as:

"The inner feeling towards any issues, it may be Either positive, neutral or Negative."

Comminuty Schools

Those secondary level schools who are funded by the government are called Community schools.

Comminuty students

Those students who are students studying at Comminuty Schools are Comminuty Schools' students.

Institutional or Boarding Schools

Those secondary level schools which is run by private sector or individuals are called Institutional or boarding school.

Institutional or Boarding Students

Those who are studying at institutional schools are called institutional students.

Rural School

Secondary level school which is situated in village area of Dharan resource centre or outside of town for eg. Bishnu Paduka, Paanwari Railway.

Rural Students

Those students who are studying at rural areas schools.

Statistical Hypothesis

Ho : $(\mu b)a = (\mu g)a$ (Null hypothesis)

H1 : $(\mu b)a$ $(\mu g)a$ (Alternative hypothesis)

Where,

Ho : $(\mu b)a$ and $(\mu g)a$ represent the mean attitude scores of boys and girls students respectively.

Ho : $(\mu u)a = (\mu r)a$ (Null hypothesis)

H1 : $(\mu u)a$ $(\mu r)a$ (Alternative hypothesis)

Where,

(μu)a and (μr)a represent the mean attitude scores of Urban and rural schools students respectively.

Ho : (μp)a = (μgr)a (Null hypothesis)

H1 : (μp)a   (μgr)a (Alternative hypothesis)

Where,

(μp)a and (μgr)a represent the mean attitude score of private and Comminuty Schools' students respectively.

***

CHAPTER-2

REVIEW OF RELATED LITERATURES

Related literature review is the important, essential and helpful part to perform the research task in a better perspective. The related and relevant studies provide the researcher to answer the questions what and how the related studies have been carried out and for a particular research,it provides direction in making the problem more realistic, precise, researchable and meaningful. Having these advantages in mind, in this study the researcher reviewed the considerable related and relevant literature carried out by various researcher in the field of attitude of students towards mathematics specially in geometry and achievement in related subject.

The major purpose of the present study is to find the attitude of Xth grade students towards geometry. So, some of the important studies done so far in this field of attitude and achievement towards geometry and other related subjects in Nepal have been carefully reviewed and their purpose, methodology and findings have been listed as below in brief.

The conclusion of the field study report submitted by Surya Bilas Bajracharya (1975) for the partial fulfillment of Master's degree in Education was that students performance were better in arithmetic and algebra than in geometry.

Pandit (1980) in his study entitled *"Attitude of Secondary School Students and their Parents Towards Mathematics and Other Subjects of Instruction"* proposed to investigate the following objectives:

1. to find the attitude of students towards Mathematics in relation to other school subjects.

2. to find the influence of sex (gender) and grade wise variation in the attitude of students towards Mathematics.

3. To find the relationship between the attitude of students towards Mathematics.

An attitude scale developed and standardized by G. Liuene was adopted as instrument to generate the data for the study. Two hundred and ten students werre

selected on the sample and asked to rank each of the subjects: English, Mathematics, Science and Social Studies on each of the nine attitude statements. A four point scale was used to convert the ranks into numerical values. Statistical analysis of the data thus generated revealed that the students ranked Mathematics the highest on most of the attitude statements. The mean measure of the attitude of male student's towards Mathematics on a school subject was significantly greater than that of female students and no grade wise variations in students attitude towards mathematics could be deducted.

Shrestha (1991) reported in a study entitled *"A Study of Sex Difference in Achievement in Mathematics of Ninth Grade Students in Gorkha District Area"*, when the comparisons were made between the genders, the findings of the study indicated that the boys overtook girls in every respect considered: in terms of whole test, in terms of area of mathematics and in terms of levels of Mathematics. But when the comparisons were made either on the sexes in the areas together with levels, it was found that there were significant differences in achievement for both the sexes in the cognitive levels whereas there were no significant difference in the areas of Mathematics. It was also conculdded that boys devoted more time than girls as home study hours for Mathematics.

"A comparative Study of Boys' and Girls Attitude towards Mathematics" was made by Tiwari (1984). The conslusions of the study were as follows:

1. Although both boys and girls held positive views that Mathematics could be learned by any one, boys seemed to exhibit higher percentage in support of the view.

2. Boys' tendency of learning Mathematics was significantly higher than girls.

3. Co-relation between students andtheir parents was significant.

According to Sharma's study (1997) entitled *"A Study of Identifying the Geometrical Ideas by Grade Eight Students of Gorkha District"*, about 81% students of eight grade were found in level 1 (Recognition) mental development of understanding geometric ideas and only about 17% students were found in level 4 (deduction)

The purpose of the study of Luitel (1996) entitled *"A Study of Attitude of Secondary School Students Towards Mathematics and its Relationship with their Achievement in Mathematics"* was to investigate the answer of the following questions.

1. Is there a significant difference between the attitude of students across the variable such as school types, grade and gender ?

2. Is there a relationship between the attitude and achievement in Mathematics ?

For the development of tools of data collection, attitude scale was constructed containing 30 negatively and 30 positively oriented statements covering five aspect areas of students' attitude on a five point Likert type scale. It was found that the final form of the attitude scale consisted 50 statements (25 positive and 25 negative) after the try-out, to measure the students attitude towards mathematics. The reliability of the test was found 0.86. The data were obtained from 140 students (84 boys and 50 girls) after administrating the attitude scale and it was also found that achievement of the students was obtained from annual examination. The finding of the study were as follows:

1. There was no signification difference between attitude of students across the variables of school type and grade.

2. Boys' attitude towards Mathematics was significantly greater than of girls'. Boys had better attitude than those of girls.

3. There was a significant relation between attitude and achievement of secondary schools students towards Mathematics.

Pandit's study (1999) was conducted:

1. to find out the attitude of secondary level students towards geometry.

2. to determine the teachers' attitude towards geometry.

3. to compare the boys' and girls' attitude towards geometry.

4. to compare the students' and teachers' attitude towards geometry.

To achieve these objectives of the study, two sets of Likert type opinionnaires were developed based on H.F., Bell measures according to "Taxonomy of Attective Educational Objectives:, included stutements related to the classroom activities, textbook and curriculum. The opinionnaires thus developed were administered on the sample of 224 students (112 from class 9 and 112 from class 10) and 15 teachers. After the statistical analysis of the collected data the following result yielded as finding of the study:

1. The students studying in secondary level had a positive attitude towards geometry.

2. The teachers had negative attitude towards secondary level geometry.

3. The boys had better attitude than those of girls towards secondary geometry.

4. The mean attitude scores of students towards geometry was significantly greater than that of their teachers:

The purpose of Sharma's study (2000) entitled *"A Comparative study of the Achievements of Students of Grade Nine in the Topic 'Vectors' of Secondary School Mathematics Curriculum"* was to study the achievement of students of grade nine in the topic 'vectors' of opt mathematics subjects across the variables such as school's type, location and gender.

The instrument adopted was an achievement test which contained multiple choice items on knowledge, comprehension, application, analysis, synthesis and evaluation of the cognitive level. It was found that the test was administered to 140 students selected in the sample from both private and public schools. Based on the analysis and interpretation of data, the findings wre as follows:

1. The mean achievement of the students of private and urban schools were significantly higher than the achievement of public and rural schools respectively.

2. The mean difference of the achievement of boys and girls was statistically significant.

Panthi (2000) studied comparatively the achievements in geometry of eight grader students in Lamjung District. The prime concern of this study is to explore the achievement patterns of students in the achievement of geometry and to make gender wise comparison of achievements of students of urban and rural area.

Two set of tools, an achievement test in eight grade geometry and interview questionnaire to investigate the total time devoted to study geometry at home, were developed and administered to 262 students from the six sampled schools out of 39 co-educational public school in Lamjung District. Statistical analysis of the data found the significant result as follows:

1. Urban areas' students and boys perform better in geometry than students from rural areas and girls respectively.

2. Urban and rural male students perform significantly better than urban and rural female students.

3. Urban students devoted more time to study geometry at home than the rural students.

Conceptual Framework of Attitude

Various kinds of rating scales have been developed to measure attitude directly (i.e. The person knows their attitude is being studied) The most widely used is the likert scale.

Likert (1932) developed the principle of measuring attitude by asking people to repond to a series of statements about a topic, in terms of the Extent to which they agree with them, and so tapping into the cognitive and affective components of attitudes.

Likert type or frequency scales use fixed choice response formats and are designed to measure attitude or openions. These ordinal scales measure levels of agreement/disagreement.

A likert type scale assumes that the strength/intensity of Experience is linear, i.e. on a continuum from strongly agree to strongly disagree, and makes the

assumption that attitudes can be measured. Respondent may be offered a choice of five to seven or even nine pre-coded responses with the nentrial point being nigther agree nor disagree.

In this study, the researchers' intends to find out the attitude of Xth grade students towards geometry and its relationship with their achievement in geometry based on the following criteria. These criteria are based on several methodology books and research reports in the field of attitude.

Among these, Pandit, A.R. has quoted H.F. Bell, in his thesis *"A Study on Attitude Towards Geometry of Secondary Students and Teachers in Tanahun District",* about the attitude of students. It says that those persons who have the following factors will be considered as having positive, neutral and negative attitude.

1. Receiving

2. Responding

3. Valuing

4. Organization

5. Characterization

Mr. Luitel S.R. has quoted Mr. 'Edwards, A.L. in his thesis *"A Study of Attitude of Secondary School Students Towards Mathematics"* about the attitude of the students. It says that those who have the following factors will be considered as having positive, neutral or negative attitude towards mathematics:

1. Habits in mathematics.

2. Doing homework in mathematics.

3. Importance of mathematics.

4. Instructional materials in mathematics.

5. Interest in studying mathematics textbook.

Mr. Sidhu, K.S. has described the attitude as the inner feeling towards any issues, it may be either positive, neutral or negative.

Considering all these findings and Juxtaposing these ideas, with the researcher's experience, the researcher has considered the following area of students opinions towards geometry as the criteria for the attitude of IX grade students towards geometry.

1. Studying habits in geometry.

2. Their interest in studying geometry textbook.

3. Their enjoyment in doing homework in geometry.

4. The instructional materials in geometry.

5. The familiarity with the importance of geometry.

***

CHAPTER - 3

METHODOLOGY

This chapter presents the details of the plan and procedure of the study, which has to collect the necessary data as required for the study. A descriptive survey method along with quantitative analysis of data will be used in this study. The major procedures followed in this study are as follows:

3.1 Population

The population of the study consists of all Xth grade students of all government and private or boarding schools' students in both urban and rural areas of Dharan resource centre in the academic year 2069.

3.2 Sample of the Study

3.2.1 District Selection

In order to draw the represent ative sample out of all the district of Nepla. The resercher choose sunsari district by convinent sampling.

3.2.2 Resource Centre Selection

In sunsari district there are many Institutional and Community schools that's why the researcher choose Dharan resources centre to restrict the research.

3.2.3 School and Student Selection

In order to draw the representative sample out of all secondary (Private or government) schools of DRC 8 schools (5 government and 3 private or boarding schools out of which 4 are Comminuty Schools from rural and 1 from urban area, and 2 private or boarding schools from urban and 1 from rural area) will be selected by using stratified random sampling method. Further, all the schools in the sample are coeducational schools. Among all students of eight sampled schools, 100 students (50 boys and 50 girls, out of which 24 students are from private or boarding schools and 76 students from Comminuty Schools) are selected randomly for making proportionate sample.

From 4 Comminuty Schools, 56 students (28 boys and 28 girls; 14 students from each schools equally from boys and girls) and from one government school, 20 students (10 boys and 10 girls) were selected randomly from rural and urban areas' schools respectively. Similarly, 24 students (12 boys and 12 girls; 8 from each school) are selected randomly from 2 urban and 1 rural areas' private or boarding schools selected in the sample. Appendix A presents the name, location and type of the schools and number of students (boys and girls from each schools) included in the sample.

3.3 Tools or Instruments

Basically, to achieve the objectives and the verification of the hypotheses, this study required three types of data.

i)   Data pertaining to the attitude of students in geometry.

ii)   Students' bio-data relating gender, studying in government or boarding schools, rural and urban location.

For collecting necessary data as required for the study, single type of instrument (attitude scale) and student's bio-data form are constructed by the researcher.

The first instrument is an 'attitude scale' to explore about the attitude of the students (related to the study habits in geometry, the enjoyment in doing homework in geometry, their interest in studying geometry textbooks, the instructional materials in geometry, and the familiarity with the importance of geometry) towards geometry.

3.3.1 Attitude Scale

The Attitude scale towards geometry is develop by the researcher as the tool or instrument for measuring the Attitude of sampled students towards geometry, under the guidance of the supervisor.

For the development of "attitude scale", various areas of students' characteristics will be identified with the help of pertinent literature and concerned experts and collogues, It is decided to include the attitude statements from the five

areas of students characteristics which are related to the studying habits in geometry, their enjoyment in doing homework in geometry, their interest in studying textbook of geometry, liking instructional materials and activities of geometry and the familiarity with the importance of studying geometry.

After having identified these areas, positive and negative statements related to these areas will be developed, collected and complied. These statements will be thoroughly revised with the help of experts opinions and criticisms of the colleagues. After that, it will be finalized with necessary modification and correction by collecting and incorporating, opinions, suggestions and criticisms given by the concerned experts and colleagues.

The final version of "attitude scale" prepared by the researcher contained 40 attitude statements providing five category responses i.e. strongly agree, agree, undecided, disagree, and strongly disagree for each item arranged in the Likert format. There were 20 statements on each negative and positive. reactions including five different areas of students' characteristics related to the attitude towards geometry as mentioned above. The areas of students' characteristics which are considered on the areas of students' attitude and number of statements included in the "attitude scale" is given in the table no. 1 and a sample items so developed is given in the table no. 2 below.

Table No. 1

Area of Students' Attitude and Number of Statements

S.N.	Area of Students' Attitude	No. of Positive Statement	No. of Negative Statement
1.	Studying habits in geometry	4	4
2.	Enjoyment in doing homework	4	4
3.	Interest in studying textbook of geometry	4	4
4.	Liking instructional materials	4	4
5.	Familiarity with the importance of studying geometry	4	4
	Total	20	20

Table No. 2

Sample Item of 'Attitude Scale'

S.N	कथनहरू	प्रतिक्रिया				
		SA	A	U	DA	SDA
१.	ज्यामिति सम्बन्धी ज्ञान मलाई आवश्यक छ ।					
२.	ज्यामितिमा रमाइला र रुचिकर समस्याहरू रहेका हुन्छन् ।					
३.	व्यावहारिक जीवनमा ज्यामितिको फिटिक्कै महत्व छैन ।					
४.	ज्यामितिको कक्षा अन्य कक्षाहरूभन्दा चाखलाग्दो र रमाइलो हुँदैन ।					

These 40 items selected in the "attitude scale" were arranged in a specific order, along with necessary instructions for the respondents. The Appendix-1 presents the final form of "attitude scale" which was used to collect the required data for achieving the desired objectives of the study.

3.3.2 Student Bio-data Form

The students' bio-data relating to their gender, school, type of school and its location (rural or urban), VDC of Municipality etc. will be developed by the researcher. So, the respondent is require to indicate whether he/she is boy/girl, location of the school urban/rural, type of school (government/private) etc. This bio-data form is also attached to the attitude scale boodlet.

3.3.3 Validations of tools

To verify the datas and the finding, The researcher will collect the views of teachers and parents, The teachers openion about students will be collected as well as

parents openion about their children also be collected. After analysing all the datas. It will be matched with the view of teachers and parents.

3.4 Data Collection Procedure

For the purpose of administration of the tools, the researcher was visited each of the schools included in the sample and contacted to the headmasters/principles and the subject teachers. After consultation with the concerned personnel of each school, students will be selected, in the manner described in sections 2.1 and 2.2 and time is scheduled for administration o the questionnaires of five points attitude scale. Before administrating attitude scale, subjects are requested to fill up the students' bio-data form first and then the respond to all 40 items on each of the attitude scale with the help of instruction given along with questionnaires. At last, questionnaires are administered to the students of sampled schools. The time given to attitude scale will be one hour geometry sampled students geometry in relation to Dharan resource centre.

3.5 Scoring Procedure

As already mentioned above one type of closed form of questionnaires i.e. attitude scale towards geometry will be used to generate the data for this study questionnaire of attitude scale which consisted of 40 items having 20 on each of the positive and negative statements in the form of five-points response i.e. strangly agree, agree, undecided, disagree and strongly disagree. For the positive statements scores 2,1,0-1 and -2 will be given in favour of each responses accordingly as:

Table No. 3

Rating Scale for Positive Statement

Meaning of ratings/responses	Scores
Strongly Agree	2
Agree	1
Undecided	0
Disagree	-1
Strongly Disagree	-2

Similarly, for the negative statements scores -2, -1, 0, 1 and 2 were given in favour of each responses accordingly as:

Table No. 4

Rating Scale for Negative Statement

Meaning of ratings/responses	Scores
Strongly Agree	-2
Agree	-1
Undecided	0
Disagree	1
Strongly Disagree	2

Second instrument was achievement test for obtaining the achievement of the sampled students in geometry. 40 multiple choice questions were used, one mark for

each correct response was given and thus the full marks for all the correct responses of the test was 40.

3.6 Statistical Techniques Used

The following statistical techniques will be applied on the obtained data to verify the hypothesis of the study.

i) The mean and standard deviation of the scores obtained in the attitude scale towards geometry were calculated on the basis of location, gender and status of the school.

ii) Various comparisons were made by using t-test to find the significance between the means of various groups.

iii) All differences were tested at 0.05 level.

***

CHAPTER - 4

ANALYSIS AND INTERPRETATION

This chapter deals with statistical analysis and interpretation of the data obtained with the help of a set of instrument the set has an attitude scale containing statements from the five areas of students characteristics such as: the study habits, enjoyment in doing homework, interest in studying textbook, liking instructional materials and familiarity with the importance towards geometry.

The data obtained from the attitude scale were tabulated on the basis of methodology mentioned in the previous chapter and analyzed for the fulfillment of the objectives and verification of the hypothesis. As already stated, the frequency of responses given by the respondents for each positive statements of the attitude scale; 2 marks for 'strongly agree', 1 for 'agree', 0 for 'undecided', -1 for 'disagree' and -2 for 'strongly disagree' were given. For each negative statements; - 2 for 'strongly agree', - 1 for 'agree', 0 for 'undecided', 1 for 'disagree' and 2 for 'strongly disagree' were given.

The mean and standard deviation of obtained data were calculated item wise first and then area wise in the attitude scale on the basis of gender, location and status of the school.

The five point responses of attitude scale was converted into three point scale and the data were analyzed in terms of agree undecided and disagree.

Various types of comparison i.e. gender wise, location wise, and status of the school wise were made by computing t-test with the help of the marks obtained by the students in attitude scale.

4.1 Comparison of Boys and Girls Attitude towards Geometry

The fourth hypothesis states that there is no significant difference between the attitude of boys and girls towards geometry.

In order to verify this hypothesis, the mean attitude scores of boys and girls were compared in relation to five different areas of students' attitude separately by using t-test. The following table presents the mean, standard deviation, mean

difference and t-values of boys and girls in relation to the different areas of students attitude towards geometry.

Table No. 5

Comparison of Students' Attitude Scores by Sex

		Group Compared				Mean Difference	T-value	P
		Boys		Girls				
S.N.	Area of Attitude	Mean	SD	Mean	SD			
1.	Studying habit	0.845	1.302	0.838	1.275	[0.007]	0.027	Not Signifi
2.	Enjoyment in doing homework	0.700	1.280	0.610	1.287	[0.090]	0.351	
3.	Interest in Studying Textbook	0.845	1.209	0.680	1.231	[0.465]	0.676	
4.	Liking Instructional Materials	0.568	1.284	0.445	1.281	[0.123]	0.480	
5.	Familiarity with the Importance	0.668	1.375	0.748	1.171		- 0.313	

Region of rejection (R) = $t \leq - 1.9600$ or $t \geq 1.9600$ [Tow tailed]

$n_1 = 50$, $n_2 = 50$

Degree of freedom (df) = $(n_1 + n_2 - 2) = 98$

Level of significance ( ) = 0.05

[Note: "Region of rejection" refers to the region of rejection of null hypothesis]

The comparison of boys' and girls' attitude towards geometry in relation to 5 different areas of students' attitude is described with the help of above table as follows:

4.1.1 Studying Habits

The above table shows that the mean difference of two groups in studying habits is 0.007 i.e. boys attitude in relation to studying habits was higher than that of girls by 0.007. The calculated t-value is 0.027 where as the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the critical region (i.e. -1.960 < 0.027 < 1.960). Thus, the mean difference 0.007 has not found statistically significant at 0.05 level. This implies that the null hypothesis of no difference between the attitude of boys and girls towards geometry was accepted regarding the studying habits.

In Teachers opinion, It was found that girls and boys have same attitude towards Geometry in relation to their studying habits, because boys and Girls were not intrested in Geometry rather than other subject. So, it is interpreted that boys and girls have the same attitude towards geometry in relation to their studying habits.

4.1.2 Enjoyment in Doing Homework

According to the table given above, the mean difference of two groups is 0.090, i.e. boys' attitude in relation to enjoyment in doing homeworks is greater than that of girls by 0.090. The computed t-value is 0.351 whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the computer t-value lies in the critical region (i.e. -1.960 < 0.351 < 1.960). This reveals that the mean difference 0.090 is not found statistically significant at 0.05 level. Hence, the null hypothesis of no difference between the attitude of boys and girls towards geometry was accepted in relation to their enjoyment in doing homework.

In teachers opinion boys and Girls both didn't enjoy in doing homework because they felt Geometry is hard portion of Mathematic. students enjoyed doing algebra and arithrometic but not in Geometry. Yes, there was difference in doing homework but it was Magical difference the boys were little bit intrested in doing homework rather than girls.

Thus, it is concluded that boys and girls have the same attitude towards their enjoyment in doing geometrical homework.

4.1.3 Interest in Studying Textbook

The table given above reveals that the mean difference between two groups is 0.165, i.e. boys' attitude towards the interest in studying geometric textbook is greater than that of girls by 0.165. The calculated t-value is 0.676 whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the critical region (i.e. -1.960 < 0.676 < 1.960). Thus, the mean difference 0.165 is not found statistically significant at 0.05 level. Hence, the result reveals that the null hypothesis of no difference between the attitude of boys and girls towards geometry is accepted regarding their interest in studying textbook.

Girls and boys both were not intrested in studying text book of Geometry because they felt that it is harder.

In parents openion also they felt that their child didn't show more intrest learning Geometry text book.

Thus, it is concluded that both boys and girls have the similar attitude towards their interest in studying geometric textbook.

4.1.4 Liking Instructional Materials

The result in the table no. 7 indicated that the mean difference of two groups in liking instructional materials is 0.123 i.e. boys' attitude towards liking instructional materials in geometry is higher than that of girls by 0.123. The computer t-value is 0.480 whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the computed t-value lies in the critical region (i.e. -1.960 < 0.480 < 1.960). Thus, the mean difference 0.123 is not found statistically significant at 0.05 level. This implies that the null hypothesis of no difference between the attitude of boys and girls towards geometry was accepted in relation to their liking instructional materials.

Thus, it is interpreted that boys and girls have similar attitude towards liking instructional materials in geometry.

4.1.5 Familiarity with the Importance

The data given in the tale no. 7 shows that the mean difference of two groups in familiarity with the importance of geometry is -0.080 i.e. boys' attitude towards familiarity with the importance of geometry is less than that of girls by 0.080. The calculated t-value is -0.313, whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the critical region (i.e.-1.960 < -0.313 < 1.960). This reveals that the mean difference -0.080 is not found statistically significant at 0.05 level. Thus, the null hypothesis of on difference between the attitude of boys and girls towards geometry is accepted regarding their familiarity with the importance of geometry.

Hence, the result of table is interrelated that both boys and girls have the same attitude towards familiarity with the importance of geometry.

In teachers opinion, the students felt the importance of Geometry in their life as weel as in carrier, boys felt that the study of Geometry is very high in the higher level i.e. science, Engeeheering field. as well as girls also felt the higher importance of studying Geometry in their life as wellas carrier.

At last, from the brief discussion about the relation of attitude between boys and girls regarding 5 different areas of attitude, it is interpreted that both boys and girls have the same attitude towards geometry.

4.2 Comparison of Urban and Rural Schools' Students Attitude Towards Geometry

The fifth hypothesis states that there is no significant difference between the attitude of urban and rural areas schools students towards geometry.

In order to verify this hypothesis, the mean attitude score of urban and rural areas schools' students were compared in relation to 5 different areas of students' attitude by using t-test. The table no. 10 given below presents the means, standard deviations, mean differences and the t-values of urban and rural areas schools' students attitude towards geometry in relation to 5 different areas of students attitude according to the responses given by the respondents in attitude scale.

Table No.6

Comparison of Students' Attitude Score by Location of the Schools

S.N.	Area of Attitude	Group Compared				Mean Difference	T-value	P
		Urban		Rural				
		Mean	SD	Mean	SD			
1.	Studying habit	0.969	1.161	0.770	1.350	0.199	0.775	Not Significant
2.	Enjoyment in doing homework	0.785	1.173	0.582	1.338	0.203	0.789	
3.	Interest in Studying Textbook	0.844	1.138	0.717	1.264	0.127	0.514	
4.	Liking Instructional Materials	0.594	1.171	0.449	1.342	0.095	0.563	
5.	Familiarity with the Importance	0.840	1.099	0.615	1.337	0.225	0.907	

Region of rejection (R) = t $\leq$ - 1.9600 or t $\geq$ 1.9600 [Tow tailed]

$n_1 = 36$, $n_2 = 64$

Degree of freedom (df) $\quad = (n_1 + n_2 - 2) = 98$

Level of significance ( ) $\quad = 0.05$

[Note: "Region of rejection" refers to the region of rejection of null hypothesis]

With the help of above table, the comparison of urban and rural areas schools' students attitude towards geometry in relation to 5 different areas of students' attitude is described as follows:

4.2.1 Studying Habits

Acording to the table given above, the mean difference of two groups is 0.199 i.e. urban school students' attitude in relation to relation to studying habits is grater than that of rural schools students by 0.199. The calculated t-value is 0.775 whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the critical region (i.e. -1.960 < 0.775 < 1.960). Thus, the mean difference 0.199 is not found statistically significant at 0.05 level. The result reveals that the null hypothesis of no difference between the attitude of urban and rural areas schools' students towards geometry is accepted regarding the studying habits.

In teachers opinion they felt that student felt Geometry is harder. That's why most of students give less time to study Geometry eighter boys or girls. in the same

way student who read in rural area or Urban area. They provide less time to study Geometry.

Hence, it is concluded that the urban and rural areas schools' students have the same attitude towards geometry in relation to their studying habits.

4.2.2 Enjoyment in Doing Homework

The table no. 8 shows that the mean difference of two groups in enjoyment in doing homework is0.203, i.e. urban school students' attitude in relation to enjoyment in doing homework is higher than that of rural school students by 0.203. The calculated t-value is 0.789, whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the critical reason (i.e. -1.960 < 0.789 < 1.960). This result reveals that the mean difference 0.203 is not found statistically significant at 0.05 level. Thus, the null hypothesis of no difference between the attitude of urban and rural schools' students towards geometry is accepted in relation to their enjoyment in doing homework.

In teachers openion. It was farind that is students who read in Urban area they eayoyed doing home work of Geometry than rural area but Marginally.

In the same way parents opinion, it was found that the student who studied in urban area student have facility of Tution that's why they felt enjoyment in doing homework but rural area students don't have such facility that's why they felt little less enjoyment in doing homework.

In teachers openinon, it was found that the most of the student who studied in urban area they took intrest in doing home work they student who studied in rural area they took little bit less intrest in studying text book of Geometry. The difference is in Margin.

So, it is interpreted that urban and rural school students have the similar attitude towards their enjoyment in doing geometrical homework.

4.2.3 Interest in Studying Textbook

The table given above shows that the mean difference of two groups is 0.127 i.e. urban areas schools students' attitude towards the interest in studying geometry textbooks greater than that of rural areas school students by 0.127. The computed t-value is 0.514 whereas the table t-value is ± 1.960 at 0.05 level of significance. which shows that the calculated t-value lies in the critical region (i.e. -1.960 < 0.514 < 1.960). Thus, result mean difference 0.127 is not found statistically significant at 0.05 level. Therefore, the result above reveals that the null hypothesis of no difference between the attitude of urban and rural schools' students towards geometry is accepted in regarding their interest in studying textbook.

In teachers opinion, it was found that the most of the student who studied in urban area they took intrest in doing home work they student who studied in rural area they took little bit less intrest in studying text book of Geometry. The difference is in Margin.

So, it is concluded that both urban and rural areas schools' students have the similar attitude towards their interest in in studying geometry textbook.

4.2.4 Liking Instructional Materials

The mean difference between two groups in liking instructional materials in the above table is 0.095, i.e. urban areas schools students' attitude towards liking instructional materials in geometry is higher than that of rural areas school students by 0.095. The computed t-value is 0.563 whereas the table t-value is ± 1.960 at 0.05 level of significance. which reveals that the calculated t-value lies in the critical region (i.e. -1.960 < 0.563 < 1.960). Therefore, the significant difference between the attitude o urban and rural areas school students towards liking instructional materials in geometry is not seen. However, the mean difference is found 0.095. Hence, the null hypothesis of no difference between the attitude of urban and rural areas school students towards geometry is accepted regarding this area of attitude.

Thus, it is interpreted that the urban and rural areas school students have the same attitude towards liking instructional materials in geometry.

4.2.5 Familiarity with the Importance

The data presented in the table given above shows that the mean difference between two groups in this areas of attitude is 0.225, i.e. urban schools students' attitude towards familiarity with the importance of geometry is greater than that of the rural school students by 0.225. The computed t-value is 0.907, whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the acceptance region (i.e. -1.960 < 0.970 < 1.960). This result determined that although the mean difference is 0.225, there is no significant difference between the attitude of urban and rural areas school students towards this area of attitude. Thus, the null hypothesis of no difference between the attitude of urban and rural school students is accepted regarding their familiarity with the importance of geometry.

In parents openion, the children who studied in Urban areas school felt that their children have ideas of Importance about Geometry is very high. In the same way the student who studied in rural areas there parents said that their childrens also have ideas about Geometry is high. When camparision made of two areas students from the point of view of their parents. There was Marginal difference.

Thus, it is concluded that both urban and rural areas' schools students have the same attitude towards familiarity with the importance of geometry.

From the above description, it is concluded that, urban areas schools students have the same attitude as the rural areas school students towards geometry.

4.3 Comparison of Private and Government School Students' Attitude Towards Geometry

The sixth hypothesis states that there is no significant difference between the attitude of private and government school students towards geometry.

In order to verify this hypothesis, the mean attitude scores of private and government schools' students were compared regarding 5 different areas of students' attitude by using t-test. The following table presents the mean, standard deviation, mean difference and the t-value of private and government schools' students attitude

towards geometry regarding 5 different areas of student's attitude according to the response s given by the students.

Table No. 7

Comparison of Students' Attitude Score by Status of the Schools

S.N.	Area of Attitude	Group Compared				Mean Difference	T-value	P
		Private		Government				
		Mean	SD	Mean	SD			
1.	Studying habit	0.932	1.121	0.809	1.336	0.123	0.447	Not Significant
2.	Enjoyment in doing homework	0.745	1.122	0.625	1.327	0.120	0.436	
3.	Interest in Studying Textbook	0.917	0.978	0.717	1.283	0.200	0.806	
4.	Liking Instructional Materials	0.714	1.037	0.444	1.347	0.270	0.030	
5.	Familiarity with the Importance	0.979	1.921	0.604	1.340	0.375	0.544	

Region of rejection (R) = t $\leq$ - 1.9600 or t $\geq$ 1.9600 {Tow tailed}

n_1 = 24, n_2 = 76

Degree of freedom (df)   = (n_1 + n_2 - 2) = 98

Level of significance ( )   = 0.05

[Note: "Region of rejection" refers to the region of rejection of null hypothesis]

The comparison of Private and Government schools' attitude towards geometry regarding 5 different areas of students' attitude is described below with the help of the table 9 given above.

4.3.1 Studying Habits

The table 11 given above shows that the mean difference of two groups is 0.123 i.e. Private school students' attitude towards the studying habits in geometry is greater than that of government schools' students by 0.123. The calculated t-value is 0.447 where as the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the acceptance region (i.e. -1.960 < 0.447 < 1.960). Thus, there was no significant difference between the attitude of private and government schools students towards the studying habits in geometry, although the mean difference is found to be significant at 0.05 level. This result reveals that the null

hypothesis of no difference between the attitude of private and government schools students towards geometry regarding the studying habits is accepted.

In teachers opinion It was found that the students who studied in Instituational school have more facilities to study and the student who studied in community schools have less facilities to study. That's why they studying habits of two types of schools students have marginal difference.

Hence, it is interpreted that the private and government school students have the same attitude towards the studying habits in geometry.

4.3.2 Enjoyment in Doing Homework

According to the table no. 9 the mean difference of two groups is 0.120. i.e. private schools students attitude towards the enjoyment in doing homework is geometry is greater than that of government schools' students by 0.120. The calculated t-value is 0.436, whereas the table t-value is ± 1.960 at 0.05 level of significance. This shows that the calculated t-value lies in the acceptance region (i.e. -1.960 < 0.436 < 1.960). Thus, mean difference 0.120 is not found statistically significant at 0.05 level. This result reveals that the null hypothesis of no difference between the attitude of private and government school students towards geometry in relation to the enjoyment in doing homework is accepted.

In parents openion it was found that the students who studied in Instituational school. Enjoyed doing homework but not as other subject. as well as the community schools student also enjoyed doing homework of Geometry not as other subject. It mean that they bith enjoyed doing homework but not as other subject. It termsof Institutional and community school students. The student who studied in Institution schools have greater enjoyment in doing homework but marginally.

Therefore, it is interpreted that the Private and government school students have the same attitude towards the enjoyment in doing homework in geometry.

4.3.3 Interest in Studying Textbook

The data given in the table 9 indicated that the mean difference between two groups regarding the students interest in studying geometric textbook is 0.200. i.e.

private schools students attitude towards geometry in relation to the interest in studying textbook is higher than that of government school students by 0.200. The calculated t-value is 0.806, whereas the table t-value is ± 1.960 at 0.05 level of significance. This shows that the calculated t-value lies in the acceptance region (i.e. - 1.960 < 0.806 < 1.960). Thus, mean difference 0.200 is not found statistically significant at 0.05 level. Therefore, the null hypothesis of no difference between the attitude of private and government school students towards geometry is accepted regarding the interest in studying textbook.

In parents and Teacher openion, It was found that the student who studied in Institutional school they have intrest in studying text book of Geometry in comparion of community school. It may be the cases of facilities which they have got in their school or from their family but the difference in not higher. It was marginal.

Hence, it is interpreted that the Private and government school students have the same attitude towards geometry regarding their interest in studying geometric textbook.

4.3.4 Liking Instructional materials

The mean difference between two groups regarding this areas of attitude in the above table is 0.270, i.e. Private schools students' attitude towards liking instructional materials in geometry is greater than that of government school students by 0.270. The computed t-value is 0.030 whereas the table t-value is ± 1.960 at 0.05 level of significance. This means the calculated t-value lies in the critical region (i.e. -1.960 < 0.030 < 1.960). This result reveals that there is no significant different between the attitude of these two groups towards liking instructional materials in geometry, although the means difference is found to be significant at 0.05 level. Thus, the null hypothesis of no difference between the attitude of private and government school students towards geometry is accepted as regards this area of students' attitude.

Therefore, it is interpreted that the private and government school students have the similar attitude towards liking instructional materials in geometry.

4.3.5 Familiarity with the Importance

The data mentioned in the table 9 above shows that the mean difference between two groups regarding this areas of attitude is 0.375, i.e. private schools students' attitude towards familiarity with the importance of geometry is greater than that of government school students by 0.375. The computed t-value is 1.544, whereas the table t-value is $\pm$ 1.960 at 0.05 level of significance. This means the calculated t-value lies in the acceptance region (i.e. -1.960 < 1544 < 1.960). Thus, the mean difference is 0.375 is not found statistically significant at 0.05 level. So the above result reveals that the null hypothesis of no difference between the attitude of private and government school students towards geometry is accepted as regards this areas of attitude.

In Teachers and parents openion. It was found that theirs students and children have ideas of high importance of Geometry in their carrier, but the student who studied in institutional school have bigger aim of their carrier. That's why in comparision of two types school students. The famili arity with the importance of Geometry is higher in instituional school students than community school students.

Hence, it is concluded that the private and government schools students have the similar attitude towards familiarity with the importance of geometry.

From the above description, of Xth grade private and government schools students in relation to 5 areas of attitude, it is concluded that private school students have the similar attitude as the government school students towards geometry.

***

CHAPTER : 5

SUMMARY WITH FINDINGS, CONCLUSIONS & RECOMMENDATIONS

In this conclusion chapter, an attempt has been made to summarize the research work with findings, derive conclusions from the findings, and to point out suggestions and recommendations, after having analyzed and interpreted the data obtained. Also some suggestions for the further researcher are made.

5.1 Summary with Findings

5.1.1 Summary

It is common public opinion that female students are considered to e weaker in mathematics specially in geometry that male students. It is also supposed that government and rural school students are dominated by private and urban school in mathematics. Further, it is obvious that most of the students failures in the S.L.C. Examination occur in mathematics, supposed to be due to geometry. Also it is public opinion that most of the failure students have no general concepts in geometry and passed students have low marks in it. Thus the problem of academic failure in mathematics presents a great challenge before the educationist, professional and others working in the field of mathematics education. Many researchers have shown considerable interest in the cause responsible for the failure.

Sutdents failure in learning geometry with understanding and mastery of the geometrical concepts may be attributed to several factors including their own attitude towards geometry. Thus, in the present study, stress had been laid on investigating the attitude of students towards geometry.

The population of the study consisted of all grade X government and private school students in both urban and rural area of DRC in academic year 2069.

In order to draw the representative sample for the study, the population was first divided into two strata: 'government and private' schools, and 5 government and 3 boarding schools were selected proportionally, out of which 4 government and 1 private schools from rural area and 1 government and 2 private schools from urban area were selected. Among all X grade students of 8 sampled schools, 100 students

(50/50 boys/girls) out of which 76 students from government schools and 24 students from private schools were selected to make proportionate sample.

For collecting the data required for the study, student's bio-data form was administered. The attitude scale consisted the attitude statements related to their attitude towards the study habits in geometry, their enjoyment in ding homework in geometry, their interest in studying the geometric textbooks, liking instructional materials of geometry and familiarity with the importance of geometry. It consisted 40 attitude statements, each 20 statements on negative and positive reaction, in five different areas of students attitude providing five category responses, i.e. strongly agree, agree, undecided, disagree and strongly disagree for each item arranged in the likert format. More than one hundred students were given to fill out the attitude scale prepared for them. But only 100 students filled out the scales prepared for them. So, the analysis was based on the responses of 100 students.

The scores 2,1,0,-1,-2 were given in favour of strongly agree, agree, undecided, disagree and strongly disagree for positive statements respectively and the scores 2,-1,0,1,2 were given in favour of strongly agree to strongly disagree for negative statements in attitude scale. For the achievement test.

To achieve the desired objectives and verification of the hypothesis of the study, the obtained data were analyzed with the help of various statistical methods such as mean, standard deviation, t-test all differences were tested at 0.05 level.

5.1.2 Findings of the Study

Statistical analysis and interpretation of the collected data from the sampled population yielded the following results as the findings of the study:

1. Boys and girls have the similar attitude towards geometry regarding all five areas of attitude.

2. Students studying in urban area performed better in geometry than those studying in rural area.

3. Private school students have the similar attitude as the government school students towards geometry in relation to five areas of students' attitude.

4. Students studying in private school performed better in geometry than those studying in government school.

5. Students' attitude towards geometry is positive regarding all five area of attitude i.e. study habits, enjoyment in doing home work, interest in studying textbook, liking instructional materials and familiarity with the importance.

6. There is location wise difference is students' attitude towards geometry regarding five areas of students characteristics.

5.2 Conclusions

On the basis of analysis and interpretation of the data obtained from attitude scale and findings derived from the analysis, some very singnificant conclusions are drawn. These conclusions have the important implications for the theory, practice, and research in the field of teaching and learning mathematics, particularly in geometry. The following results were obtained as the conclusions derived on the basis of findings of this study:

Boys achieved more than girls in geometry although they have similar attitude. Students studying in urban area and private school performed better achievement in geometry than those studying in rural area and government school, although they have same attitude towards geometry. There is a positive attitude of grade X students towards geometry. This research has found that all rural and urban schools students, private and government schools students and boys and girls have the same attitude towards geometry. This implies that the low marks in geometry is due to the cause of location and status of the school and gender factor rather than the attitude.

5.3 Suggestions and Recommendations

The conclusions derived from the findings of this study leads to the following measures which would help to improve the teaching learning situation in class room and other areas of instruction of mathematics related to geometry.

1. The findings of the study indicated that girls have similar attitude towards geometry than that of boys but they are weak in achievement than boys.

Therefore, to improve the achievement of girls the following suggestions would be helpful.

 i) Girls should be encouraged and motivated to devote more time on studying geometry with other subjects.

 ii) To encourage and motivate girls towards learning geometry, teacher should make them participate in class.

2. This study identified that rural areas and government schools' students are weak in achievement than urban and private schools' students although they have same attitude towards geometry as uraban and private schools' students. Therefore, to improve the performance of rural and government schools' students in geometry:

 i) teaching methods, facilities and time devoted in class by urban and private schools should also be adopted in rural and government schools.

 ii) subject teacher should be trained regarding the development in the field of geometry.

 iii) the government rural school teachers should observe the ways that the private urban schools teachers teach geometry in schools. Possible techniques should be used to transform teaching in government and rural schools.

 iv) Besides method of teaching, class size and other physical facilities also have affected the performance. Therefore, the class size of government and rural areas schools' should make small as private schools.

5.4 Suggestions for the Further Research

The conclusions of this study can not be generalized to all levels of schooling due to the limitations of the study. On the basis of the study, the following suggestions are made for further research.

1. Similar study should be extended to a large number of students drawn from greater number of institutions.

2. Similar study should be conducted for other grades as well as all levels of schooling.

3. The investigation should be done region wise as well as nationwide wise to obtain broader and valid generalization.

4. This study examined only the students' attitude towards geometry, it didn't say anything about teachers' attitude towards geometry. Thus, further research is needed in this direction, considering the teachers' attitude towards geometry.

5. Similar study should be conducted to study the influence of parental attitude towards geometry, home environment of the student, social status, facilities provide in the school, teacher and teaching methods.

***

References

Best, John w. 1986. *"Research in Education"*, New Delhi, Prentice Hall of India Pvr. Ltd.

Boyer, Carl B., *"A History of mathematics"*, New York, John Willy and Sons.

CERID 1999, *"Assessment of Learning Achievement of Lower Secondary Children (Grade 6 and 8)"* Ktm. T.U., Tripuseshwor,

Datta, Bibhutibhusan and Singh, Avadesh Narayan, 1962, *"History of Hindu Mathematics, A source Book"*, Kirtipur, Asia Publishing House, Bombay, Quoted from Masterial Thesis Conducted by Akaraj Pandit, T.U.

Freund, John E. 1994, *"Mathematical Statistics"* (Fifth Edition) New Delhi, Prentice Hall of India Pvt. Ltd.

Kelly, Poul J. and Ladd, Norman E. *"Fundamental Geometry"*, New Delhi, Eurasia Publishing House.

Luitel, Shankar Raj 1996, *"A Study of Attitudes of Secondary School Students Towards Mathematics and its Relationship with their Achievement in mathematics"*, Unpublished Master's Thesis, T.U., Faculty of Education, Kathmandu, Mahendra Ratna Campus, Tahachal.

Pandit, Ekaraj 1999, *"A Study on Attitude Towards, Geometry of Secondary Students and Teachers in Tanahun District"*. Kirtipur, Master's Thesis, Tribhuvan University, Faculty of Education.

Pandit, R.P. 1980, *"Attitude of Secondary School Students and their Parents towards Mathematics and other Subjects of Instruction"* Unpublished M.Ed. Dissertation, Tribhuvan University, Faculty of Education, Kirtipur.

Pandit, R.P. 1999, *"Inferential Statistics in Research and Education"*, Ktm., Ananta Prakashan.

Pandit, R.P. 2000, *"Geometry for Teachers"*, Ktm., Ananta Prakashan.

Sharma, Lekha Nath 1997, *"A Study of Identifying the Geometrical Ideas by Grade Eight Students of Gorkha District"* Kirtipur, Unpublished Master's Thesis, Tribhuvan University, Faculty of Education, Department of Mathematics.

Shrestha, Min Bahadur 1991, *"A Study of Sex Difference Achievement in Mathematics IX Grade Students in Gorkha District"*, Master's Thesis, Department of Mathematics Education, T.U.

Sidhu, K.S. 1984, *"Methodology of Research in Education"*, New Delhi, Sterling Publishers Private Limited.

APPENDIX-A

Selected Schools and Students in the Sample

S.N.	Name of the School	Address	Location	Type	Number of Student		
					Boys	Girls	Total
1.	Public Higher Sec. School	Dharan	Urban	Government	7	7	14
2.	Saraswati Higher Sec. School	Panwari	Rural	Government	7	7	14
3.	Panchayat sec. School	Pailway	Rural	Government	7	7	14
4.	Jwala Se. School	Bishnupaduka	Rural	Government	7	7	14
5.	Himali Ma.vi.	Deurali	Rural	Government	10	10	20
6.	Koshi Boarding She.	Chatara	Rural	Private	4	4	8
7.	Himalayan Boarding	Dharan	Urban	Private	4	4	8
8.	Araniko Boarding School	Dharan	Urban	Private	4	4	8
	Total				50	50	100

APPENDIX-B

ज्यामितिप्रति विद्यार्थीहरूको अभिवृत्ति सम्बन्धी प्रश्नावली

प्यारा विद्यार्थी भाइ बहिनीहरू

म शिक्षा शास्त्र संकाय अन्तर्गत स्नातकोत्तर ९:ाभ्म।० तहमा अध्ययनरत विद्यार्थी हुँ । मैले स्नातकोत्तर उपाधि प्राप्त गर्नको लागि पाठ्यक्रमले निर्धारण गरे अनुसार ५० (५०) पूर्णाङ्कको शोध पत्रको रूपमा "ज्यामितिप्रति कक्षा १० का विद्यार्थीको अभिवृत्ति" भन्ने शीर्षकमा एउटा लघु अनुसन्धान कार्य गर्न लागेको छु । ज्यामितिप्रति तिमीहरूको अभिवृत्ति थाहा पाउनको लागि यो प्रश्नावली तयार पारिएको छ । यस प्रश्नावलीलाई दुई भागमा बाँडिएको छ । प्रथम भागमा विद्यार्थीहरूको व्यक्तिगत विवरण र दोस्रो भागमा गणित विषयमा विद्यार्थीको अभिवृत्ति सम्बन्धी ४० वटा कथनहरू दिएका छन् :

१. तलको तालिकामा अभिवृत्ति सबन्धी कथनहरू दिएका छन् । उक्त कथनहरूको ठिक वा बेठीक उत्तर हुँदैन, त्यो त तिमीहरूको धारणा र अनुभवमा आधारित हुन्छ । प्रत्येक कथनमा ५ वटा सम्भाव्य विकल्पहरू : पूर्ण सहमत, सहमत, अनिश्चित, असहमत र पूर्ण असहत निर्धारण गरिएको छ । त्यसैले उक्त कथनहरू पहिले सावधानीपूर्वक अध्ययन गरी आफ्नो धारणालाई प्रस्तुत गर्नको लागि दिएका विकल्पमध्ये तिमी पूर्ण सहमत ९क्तचयलनथि ब्नचभभ०) भए क्ष, सहमत ९ब्नचभभ०) भए ब, अनिश्चित ९ग्लमभअष्भम०) भए ग, असहमत ९म्क्बनचभभ०) भए झ्ब र पूर्ण असहमत ९क्तचयलनथि म्क्बनचभभ०) भए क्ष्ब को ठीक मुनी ठीक चिन्ह (μ)लगाई आफ्नो प्रतिक्रिया जनाइ देउ ।

२. आफूलाई शंका लागेमा वा नबुझेका ठाउँमा शोधकर्तासँग छलफल गरेर मात्र प्रतिक्रिया जनाइ देऊ ।

३. तिमीहरूका प्रतिक्रिया तथा विचार शोधकार्यको लागि मात्र प्रयोग गरिने छ ।

विद्यार्थी सम्बन्धी सामान्य जानकारी:

निर्देशन : तल दिएका बुँदाहरूका बारेमा सही जानकारी देऊ वा ठीक चिन्ह लगाऊ :

१. विद्यार्थीको नाम : .... मिति ....

२. कक्षा : .... सेक्सन : .... रोल नं. ....

३. लिङ्ग (केटा ( )/ केटी ( )

४. विद्यालयको नाम र ठेगाना : ....

५. विद्यालयको प्रकार : सरकारी ( ) / निजी ( )

६. प्रशासनिक इकाइ : अञ्चल .... जिल्ला .... गा.वि.स./न.पा....

७. अवस्थिति : सहरी ( ) / ग्रामीण ( )

ब्एएभ्ल्म्क्ष्ट(ॠ

अभिवृत्ति सम्बन्धी प्रश्नावली

९४०	विद्यार्थीहरूको अध्ययन बानी सम्बन्धी कथनहरू					
क्र.स.	कथनहरू	प्रतिक्रिया				
		क्ठ	ठ	र	म्ठ	क्ष्ठ
१.	ज्यामिति सम्बन्धी ज्ञान मलाई आवश्यक हुन्छ ।					
२.	ज्यामिति विषय पढ्दा बेकारमा समय बर्बाद हुन्छ ।					
३.	मलाई ज्यामिति अध्ययन गरेर नयाँ कुरा सिक्न मन लाग्छ ।					
४.	गणित अध्ययनमा पहिलो प्राथमिकता ज्यामितिलाई दिन्छु					
५.	ज्यामितिको अध्ययन गर्नु वा नगर्नुले मलाइ खासै असर गर्दैन ।					
६.	ज्यामितिको अध्ययनलाइ मैले अतिरिक्त भार सम्झेको छु ।					
७.	ज्यामितिको कक्ष, विजगणित, अंकगणित वा अन्यको भन्दा रमाइलो र आकर्षक हुन्छ ।					
८.	ज्यामिति सम्बन्धी पाठ्यपुस्तक वा अन्य सामग्री अध्ययन गर्न मलाई मन लाग्दैन ।					
९६४०	विद्यार्थीहरूको गृहकार्य सबन्धी कथनहरू:					
९.	म ज्यामितिको गृहकार्य समयमै गर्छु ।					
१०.	ज्यामितिमा रमाइला र रुचिकर समस्याहरू रहेका हुन्छन् ।					
११.	ज्यामितिका गृहकार्य भएमा मलाई अत्यास लागेर आउँछ ।					
१२.	गुरुले गृहकार्य हेरेपछि गर्ने आलोचना वा सुफाावबाट म तर्सन्छु ।					
१३.	विद्यालय विदाको समयमा म प्रायः ज्यामितिबाट टाढा रहन्छु ।					
१४.	ज्यामितिय चित्रहरू बनाउँदा म समय बितेको पत्तै पाउँदिन ।					
१५.	जब गुरुले ज्यामिति सम्बन्धी प्रश्न सोध्नुहुन्छ म तत्कालै जवाफ दिन तयार हुन्छ ।					
१६.	ज्यामितिय समस्या समाधान गर्न, अंकगणितीय, विजगणितीय वा अन्य समस्या समाधान गर्न भन्दा पट्यारलाग्दो हुन्छ ।					
९६६४०	ज्यामितिका पाठ्यपुस्तक पढ्ने चाहना सम्बन्धी कथनहरू:					
१७.	स्तरीय पाठ्यपुस्तकको अभावमा ज्यामितिको अध्ययन अधुरो हुन्छ ।					
१८.	ज्यामितिको लागि छुट्टै पाठ्यपुस्तक भएमा म खुशी हुने थिएँ ।					
१९.	मैले ज्यामितिका पाठ्यपुस्तक पढ्नुको अन्तिम उद्देश्य केही छैन ।					
२०.	म समय बिताउनको लागि ज्यामिति पुस्तकको अध्ययन गर्छु ।					
२१.	ज्यामिति अहिलेको युगमा एक महत्वपूर्ण विषय भएकोले म यसको अध्ययन गर्छु ।					
२२.	ज्यामितिका पुस्तक जुनसुकै व्यक्तिले सजिलै अध्ययन गर्न सक्दैन ।					
२३.	ज्यामितिको अध्ययनले आत्मविश्वास बढाउँछ ।					
२४.	ज्यामितिको किताबदेखि टाढा रहँदा मलाई शान्ति हुन्छ ।					
९६६०	शैक्षणिक सामग्री सम्बन्धी कथनहरू					
२५.	ज्यामितिय अध्ययनका स्तरीय पाठ्यपुस्तक छन् ।					
२६.	विभिन्न पत्रपत्रिका रेडियो, टी.भी.मा निस्केका ज्यामितिका रमाइला कुराहरू म खोजी खोजी पढ्ने गर्छु ।					
२७.	ज्यामिति सबभन्दा चाख नलाग्ने विषय भएकाले म यसको अध्ययन गर्दिन ।					
२८.	गुरु र अभिभावकले जे सुकै भने पर्नि म ज्यामिति सिक्न प्रयत्न गर्दिन ।					

२९.	ज्यामिति सिकाइमा हामीलाई शैक्षिक सामग्रीले व्यावहारिक ज्ञान दिन्छ ।					
३०.	संसारका जुनसुकै भौतिक वस्तु ज्यामितिका शैक्षिक सामग्री हुन सक्छन् ।					
३१.	ज्यामितिका कक्षाहरू अन्य कक्षाहरूभन्दा चाल लाग्दा र रमाइला हुँदैनन् ।					
३२.	शैक्षिक सामग्री प्रयोग गरेर गरिएको शिक्षण झन्झटिलो हुन्छ ।					
९.७	**ज्यामितिको महत्व सम्बन्धी कथनः**					
३३.	आजको वैज्ञानिक युगमा ज्यामिति अध्ययनको महत्व झन बढेको छ ।					
३४.	दैनिक जीवनमा आइपर्ने व्यावहारिक समस्या समाधान गर्न मैले ज्यामितिको अध्ययन गर्नुपर्छ ।					
३५.	वास्तविक ज्यामिति अध्ययनबाट म कुनै उपलब्धि पाउँदिन ।					
३६.	ज्यामिति सिकइमा समय र श्रमको खर्च गर्नु भनेको मेरो विचारमा वास्तविक लगानी होइन ।					
३७.	ज्यामितिको अध्ययनले गणितका अरु क्षेत्रको अध्ययनमा पनि सहयोग गर्दछ ।					
३८.	उच्च शिक्षाको लागि ज्यामितिको ज्ञान आवश्यक छैन ।					
३९.	वैज्ञानिक अध्ययन ज्यामितिको अध्ययन विना अधुरो हुन्छ ।					
४०.	व्यावहारिक जीवनमा ज्यामितिको फिटिक्कै महत्व छैन ।					

धन्यवाद

सन्तोष राय

APPENDIX-D

अभिवृत्ति सम्बन्धी प्रश्नावली

(I)	विद्यार्थीहरूको अध्ययन बानी सम्बन्धी कथनहरू							
क्र.स.	कथनहरू	प्रतिक्रिया						
		SA	A	U	DA	SDA	$\bar{X}$	SD
१.	ज्यामिति सम्बन्धी ज्ञान मलाई आवश्यक हुन्छ ।	59	25	6	6	4	1.290	1.085
२.	ज्यामिति विषय पढ्दा बेकारमा समय बर्बाद हुन्छ ।	1	11	13	20	55	1.170	1.092
३.	मलाई ज्यामिति अध्ययन गरेर नयाँ कुरा सिक्न मन लाग्छ ।	54	31	10	4	1	1.330	0.888
४.	गणित अध्ययनमा पहिलो प्राथमिकता ज्यामितिलाई दिन्छु	14	37	18	20	11	0.230	1.238
५.	ज्यामितिको अध्ययन गर्नु वा नगर्नुले मलाइ खासै असर गर्दैन ।	15	7	16	25	37	0.620	1.427
६.	ज्यामितिको अध्ययनलाइ मैले अतिरिक्त भार सम्झेको छु ।	9	11	14	21	45	0.820	1.351
७.	ज्यामितिको कक्ष, बिजगणित, अंकगणित वा अन्यको भन्दा रमाइलो र आकर्षक हुन्छ ।	24	28	10	27	11	0.270	1.377
८.	ज्यामिति सम्बन्धी पाठ्यपुस्तक वा अन्य सामग्री अध्ययन गर्न मलाई मन लाग्दैन ।	8	7	10	27	48	1.000	1.263
(II)	विद्यार्थीहरूको गृहकार्य सबन्धी कथनहरू:					Total	0.841	1.288
९.	म ज्यामितिको गृहकार्य समयमै गर्छु ।	60	20	4	10	6	1.800	
१०.	ज्यामितिमा रमाइला र रुचिकर समस्याहरू रहेका हुन्छन् ।	20	39	26	13	2	0.620	
११.	ज्यामितिका गृहकार्य भएमा मलाई अत्यास लागेर आउँछ ।	4	17	14	38	27	0.670	
१२.	गुरुले गृहकार्य हेरेपछि गर्ने आलोचना वा सुभावबाट म तर्सन्छु ।	12	18	15	20	35	0.480	
१३.	विद्यालय विदाको समयमा म प्रायः ज्यामितिबाट टाढा रहन्छु ।	5	7	11	36	41	1.010	
१४.	ज्यामितिय चित्रहरू बनाउँदा म समय बितेको पत्तै पाउँदिन ।	30	26	19	17	8	0.530	
१५.	जब गुरुले ज्यामिति सम्बन्धी प्रश्न सोध्नुहुन्छ म तत्कालै जवाफ दिन तयार हुन्छ ।	27	37	11	16	9	0.570	
१६.	ज्यामितिय समस्या समाधान गर्न, अंकगणितीय, बिजगणितीय वा अन्य समस्या समाधान गर्न भन्दा पट्यारलाग्दो हुन्छ ।	13	28	12	22	25	0.180	
						Total	0.655	1.284
(III)	ज्यामितिका पाठ्यपुस्तक पढ्ने चाहना सम्बन्धी कथनहरू:							
१७.	स्तरीय पाठ्यपुस्तकको अभावमा ज्यामितिको अध्ययन अधुरो हुन्छ ।	39	32	14	9	6	0.890	1.197
१८.	ज्यामितिको लागि छुट्टै पाठ्यपुस्तक भएमा म खुशी हुने थिएँ ।	53	24	14	4	5	1.160	1.126
१९.	मैले ज्यामितिका पाठ्यपुस्तक पढ्नुको अन्तिम उद्देश्य केही छैन ।	3	7	23	34	33	0.870	1.051
२०.	म समय बिताउनको लागि ज्यामिति पुस्तकको अध्ययन गर्छु ।	11	15	24	17	33	0.460	1.374
२१.	ज्यामिति अहिलेको युगमा एक महत्वपूर्ण विषय भएकोले म यसको अध्ययन गर्छु ।	38	30	18	6	8	0.840	1.229
२२.	ज्यामितिका पुस्तक जुनसुकै व्यक्तिले सजिलै अध्ययन गर्न सक्दैन ।	24	30	24	12	10	0.460	1.259
२३.	ज्यामितिको अध्ययनले आत्मविश्वास बढाउँछ ।	31	29	26	7	7	0.700	1.185
२४.	ज्यामितिको किताबदेखि टाढा रहँदा मलाई शान्ति हुन्छ ।	6	11	21	29	33	0.720	1.207
						Total	0.763	1.221

(IV)	शैक्षणिक सामग्री सम्बन्धी कथनहरू							
२५.	ज्यामितिय अध्ययनका स्तरीय पाठ्यपुस्तक छन् ।	28	22	32	8	10	0.500	1.259
२६.	विभिन्न पत्रपत्रिका रेडियो, टी.भी.मा निस्केका ज्यामितिका रमाइला कुराहरू म खोजी खोजी पढ्ने गर्छु ।	17	27	13	30	13	0.050	1.336
२७.	ज्यामिति सबभन्दा चाख नलाग्ने विषय भएकाले म यसको अध्ययन गर्दिन ।	6	11	15	29	39	0840	1.229
२८.	गुरु र अभिभावकले जे सुकै भने पनि म ज्यामिति सिक्न प्रयत्न गर्दिन ।	9	10	11	36	34	0.760	1.272
२९.	ज्यामिति सिकाइमा हामीलाई शैक्षिक सामग्रीले व्यावहारिक ज्ञान दिन्छ ।	27	28	34	4	7	0.640	1.133
३०.	संसारका जुनसुकै भौतिक वस्तु ज्यामितिका शैक्षिक सामग्री हुन सक्छन् ।	13	28	38	10	11	0.220	1.142
३१.	ज्यामितिका कक्षाहरू अन्य कक्षाहरूभन्दा चाल लाग्दा र रमाइला हुँदैनन् ।	6	23	14	2	27	0.490	1.275
३२.	शैक्षिक सामग्री प्रयोग गरेर गरिएको शिक्षण झन्झटिलो हुन्छ ।	14	12	16	21	37	0.550	1.445
						Total	0.506	1.283
(V)	ज्यामितिको महत्व सम्बन्धी कथनः							
३३.	आजको वैज्ञानिक युगमा ज्यामिति अध्ययनको महत्व झन बढेको छ ।	47	31	12	3	7	1.080	1.161
३४.	दैनिक जीवनमा आइपर्ने व्यावहारिक समस्या समाधान गर्न मैले ज्यामितिको अध्ययन गर्नुपर्छ ।	23	34	24	10	9	0.520	1.210
३५.	वास्तविक ज्यामिति अध्ययनबाट म कुनै उपलब्धि पाउँदिन ।	5	8	19	30	38	0.880	1.157
३६.	ज्यामिति सिकाइमा समय र श्रमको खर्च गर्नु भनेको मेरो विचारमा वास्तविक लगानी होइन ।	17	9	15	31	28	0.440	1.424
३७.	ज्यामितिको अध्ययनले गणितका अरु क्षेत्रको अध्ययनमा पनि सहयोग गर्दछ ।	33	32	22	9	4	0.810	1.116
३८.	उच्च शिक्षाको लागि ज्यामितिको ज्ञान आवश्यक छैन ।	9	13	30	22	28	0.450	1.274
३९.	वैज्ञानिक अध्ययन ज्यामितिको अध्ययन विना अधुरो हुन्छ ।	27	30	20	14	9	0.520	1.275
४०.	व्यावहारिक जीवनमा ज्यामितिको फिटिक्कै महत्व छैन ।	8	9	15	22		0.890	1.302
						Total	0.699	1.259

धन्यवाद
सन्तोष राय

APPENDIX - E

Statistical Formulae Used in the Analysis of Data

1. For Obtaining Mean : $\overline{X} = \dfrac{\sum X}{N}$

2. For Obtaining Standard Deviation : $\sigma_{n-1} = \sqrt{X^2 - \dfrac{(\sum X)^2}{N}}$

3. For Obtaining t-value [from mean]

$$t = \dfrac{\overline{X}^1 - \overline{X}^2 - (\mu^1 - \mu^2)}{\sqrt{\dfrac{\sigma 1^2}{n^1} + \dfrac{\sigma 2^2}{n^2}}}$$

Where,

$\overline{X}^1, \overline{X}^2$ = Sample mean, μ_1, μ_2 = Population mean