



Present Status of Geometry at Secondary School Level of Karimganj District

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Abstract

The study investigated the causes of poor performance of secondary school students of karimganj district in the subject geometry. The sample consisted of 252 students (both boys and girls of Class IX and X from rural and urban areas) of Karimganj district. Data were collected through survey method. Data of the present study are analyzed using pie diagram, bar diagram and ogive. The findings of the study led to the conclusion that the performance of students in geometry at secondary school level is very low. It can be concluded that most of the students are too much weak in the subject geometry and they should be encouraged by the teachers, parents and community so that they can be made interested in geometry and they can achieve a high position in the subject geometry.

Keywords: Geometry, Students, Education, Poor performance, Nonverbal learning disorder.

Introduction: Geometry is the branch of mathematics which treats of the properties of magnitude and its relations. The word geometry is derived from the Greek words ‘geo’, which means ‘earth’ and ‘metron’, which means measure. Euclid first wrote the book of geometry named ‘Element’. It was used by the whole world for 2000 years. In this book concept of straight line, rectangle, square, circle, tangent, chord and parallelogram was described.

Geometry is the study of size, shape, and position of two dimensional shapes and three dimensional figures. However, geometry is used daily by almost everyone. In geometry, one explores spatial sense and geometric reasoning. Geometry is found everywhere in art, architecture, engineering, astronomy, space, nature, sports, machines, cars and much more. Geometry plays a vital role in everyday life. Practical application of Geometry is abundant. Geometry is useful in making things especially in construction work like houses, bridges, monuments, and many more things. Geometrical tools are also used in everyday life. ‘Pi’ is one of the important developments in geometry which is used in different fields.

Geometry is linked to many other topics in mathematics, especially measurement and is used daily by architects, engineers, physicists, and land surveyors just to name a few. In the early years of geometry the focus tends to be on shapes and solids, then moves to the properties of shapes and solids, and as abstract thinking progresses, geometry becomes much more about analysis and reasoning.

Geometry is the science of shape and extent. It deals with the space and size of bodies. The function of middle school geometry is to systematize the information received by the pupils at the

preschool and primary school stage from nature and practical arts. The emphasis is on the understanding of fundamental concepts, and techniques such as meaning, drawing, and use of lines, angles, triangles and polygons.

From time immemorial man has found that the concept of size, shape, and position are ever prominent in the pattern of his environment and that the geometric principles of equality, symmetry, congruence, and similarity are implanted in the very nature of things. Geometry has its significance in many walks of life and studies. Geometry develops the reasoning and logical thinking of the child. It improves the aesthetic sense of the child with respect to different shapes, sizes and structure of things. It provides an opportunity for creative thinking in a child. From a practical point of view geometry can help the child to be efficient in painting, designing, drawing maps, engineering etc. When taking geometry, spatial reasoning and problem solving skills will be developed. Now a days, our school do not provide sufficient means to update their knowledge in Geometry. This results in the lack of interest in learning geometry. Therefore majority of students are afraid of geometry and have developed a phobia towards it.

The observation of a geometry classroom reveals the pathetic conditions prevailing in the field. Many pupils perform poorly in geometry and find the subject very difficult and uninteresting. Student faces different types of problems in learning geometry.

Difficulties Faced By the Students While Learning Geometry

Generally the following problems are faced by the students in learning geometry –

- Learners cannot understand thoroughly the basic concepts.
- Learners cannot translate from verbal form in to pictorial form and vice - versa.
- They cannot take correct measurement in geometrical construction.
- Students are not able to use geometrical instruments properly.
- They cannot apply their geometrical knowledge in their practical situation.
- They are not able to draw figures based on the given theorem.
- They cannot suggest suitable construction for providing the theorem.
- They are not able to understand and memorize the geometrical formulae.
- They cannot understand the relationship between different concepts in geometry.

These difficulties in geometry arise due to some traditional attitude towards the subject geometry.

Traditional Attitude towards Geometry

Geometry is treated as most difficult subject by the students; the major factors behind these facts are

- Treatment of the subject in school education that has been found mostly:
 - Bore and dull
 - Dealt mostly with the abstract idea
 - Stereotype problem solving
 - Lack of separate period in the school time table that has been allotted for learning geometry.
- Teacher's behavior/ attitude with the children and the subject are generally:
 - Discouraging
 - Unfriendly
 - Negative
 -

➤ Dull classroom transaction due to:

- Less interaction in the classroom.
- Less use of teaching learning materials except chalk board and text book.
- Very less practical work.
- No scope of exploration of idea in learners own environment.
- No enjoyment for learners in classroom.
- Treatment of the concept mainly with abstract idea without linking with learners life, problem etc.
- Lack use of interesting element in the classroom.
- Stereotype assessment of the learner by the teachers.
- Lack of creating free and friendly classroom environment.
- Less involvement of the learner with the various activities.

Due to the above mentioned factors, students do not find interest in the subject and unable to learn geometry effectively. For these reasons, performance of the students is not satisfactory for which they are generally not appreciated by parents and community.

This caused a type of fear regarding the subject geometry among secondary school students.

Non Verbal Learning Disorder and Difficulty in Learning Geometry: Children with nonverbal learning disorder are a sub – group of children with learning disability. Children with learning disability show a range of learning styles and present diverse areas of strengths and weakness. The phrase learning disability which originates in the early 1960's are used to describe children who have normal intelligence but are not able to achieve adequately in the usual educational settings.

Since then there have been a number of attempt to identity sub - types of learning disabilities for the purpose of establishing appropriate intervention strategies. The sub types were categorized as children with deficiency in verbal acquisition or academic achievement and children with difficult in interpreting the meaning of others actions, gestures and facial expressions, i.e. though they have difficulty in processing nonverbal or non-linguistic information, they may be very good at processing verbal information. Usually they depend on verbal input in order to function. These types of children can understand the words but can not comprehend the meaning of what they have read. They tend to focus on details or verbal description rather than on large picture. Therefore they may have great difficulty in separating the main idea from details, developing outlines, taking notes, understanding mathematical concept based on part whole relationships such as fractions, percentage etc. This type of strength and weakness is classified as Non - verbal learning disorder.

Verbal assets of non - verbal learning disorder children include all areas of respective language. They have excellent auditory conceptual ability at the sound level of processing but they have much more difficulty in recalling pictorial or visual information.

Causes of Non - Verbal Learning Disorder

Non - verbal learning disorder is described as a development disorder of the right hemisphere of the brain that is present on or soon after birth. The right and left hemispheres appear to differ in terms of their efficiency in processing certain stimuli. The right hemisphere has a greater capacity for handling complex visual perceptual information and the left hemisphere seems to work more efficiently in applying the already learned descriptive systems that are discrete units of information such as language activities. Damage to right hemisphere can result in some complex syndromes such as attention disorders, visual perceptual disorders, memory disorder etc.

Relationship between Nonverbal Learning Disorder and Difficulty in Learning Geometry: In the learning of geometry, students use their visual perceptual abilities for drawing, construction, meaning etc. When they feel a difficulty in this visual perception or visual processing, they can't learn geometry easily. Mainly these difficulties occur in children due to right hemisphere dysfunction.

To enhance geometric ability we can use real life situations, lots of verbal explanation and hand experiences. Parent education regarding nonverbal learning disorder is of high priority. Parents need basic knowledge in order to help their child in effecting the appropriate accommodations and modifications in school.

It takes a team – the parents, the child and the teacher to make the life of a non - verbal learning disorder child a fruitful one.

Statement Of The Problem: The problem taken up for the investigation is stated as “Present Status of Geometry at Secondary School Level of Karimganj District” seeks to know the position of geometry in both rural and urban areas of Karimganj district.

Methodology: The effectiveness of any research work depends mainly on the methodology and procedure adopted in the study. A sound and well organized methodology includes the appropriate strategy in stepwise execution of the investigation. It leads the investigator to the target he/she aims at. A good research always follows a sound methodology and procedure otherwise the findings of the study will be of generalized facts.

For conducting the said research, the researcher visited different schools to collect the marks obtained by the student of secondary classes i.e. class IX and class X only. Researcher visited both rural and urban schools for getting better ideas about present position of geometry. The researcher found that in rural school, the position of subject Mathematics is very poor and the topic geometry is not well known to the students properly. The teachers are even not interested in the geometry subject. Only some of the urban schools like private school and some selected government schools have strong positions in geometry but in some other urban schools the position of geometry is same as that of rural schools. The researcher also found some other important reasons for which geometry is not interesting to the students, some of the reasons are like lack of proper instruments which are very important for geometry learning, lack of specific and sufficient time for geometry class etc.

Analysis and Interpretation of Data: Analysis and interpretation of data involves the objective material in the possession of the researcher and his subjective reaction and desires to derive from the data. Consequent upon the collection of data, there arises a need to organization, analysis and interpretation of the same, followed by formulation of conclusion and generalizations to get a true picture out of the raw data collected. Analysis of data means studying the tabulated material in order to determine inherent facts or meaning. It involves breaking down existing complex factors into simpler parts and pulling the parts together in new arrangements for purpose of interpretations. The main aim of analysis and interpretation of data chapter is to present the results of the present study to its readers, stakeholders etc. Data analysis and interpretation is the proper method/ strategy through which the results of a study can be presented to the readers.

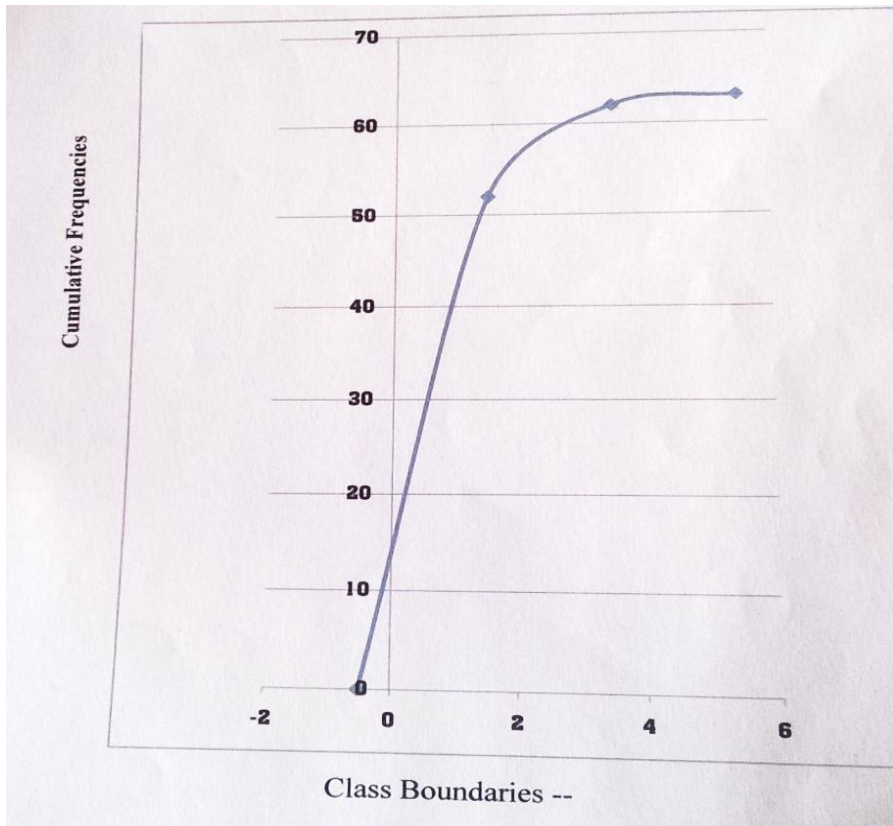
Data Collected From Nilmoni Higher Secondary School, Karimganj
Marks of Geometry (Class - X)
Total Marks – 20

Serial No.	Marks	Serial No.	Marks
1	4	33	1
2	3	34	1
3	2	35	2
4	2	36	1
5	3	37	0
6	2	38	1
7	3	39	2
8	2	40	0
9	2	41	1
10	1	42	1
11	0	43	0
12	1	44	0
13	1	45	1
14	0	46	0
15	1	47	0
16	0	48	1
17	1	49	0
18	0	50	1
19	1	51	0
20	1	52	1
21	1	53	1
22	1	54	0
23	0	55	0
24	1	56	0
25	1	57	0
26	1	58	0
27	0	59	0
28	1	60	0
29	1	61	0
30	1	62	0
31	0	63	0
32	1		

The Above Data Are Represented Graphically
Tabular Form Of Collected Data Of Nilmoni H.S. School

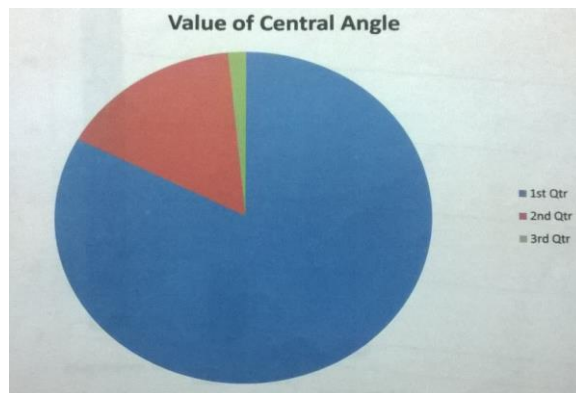
Sl. no.	Class interval	Class boundary	Mid value	Frequency	Cumulative frequency
1	0 -1	- 0.5 – 1.5	0.5	52	52
2	2-3	1.5 – 3.5	2.5	10	62
3	4-5	3.5 – 5.5	4.5	1	63

OGIVE



PIE – DIAGRAM

Marks	Value of central angle
0 -1	$(52/63) \times 360^{\circ} = 297.14^{\circ}$
2-3	$(10/63) \times 360^{\circ} = 57.14^{\circ}$
4-5	$(1/63) \times 360^{\circ} = 5.72^{\circ}$

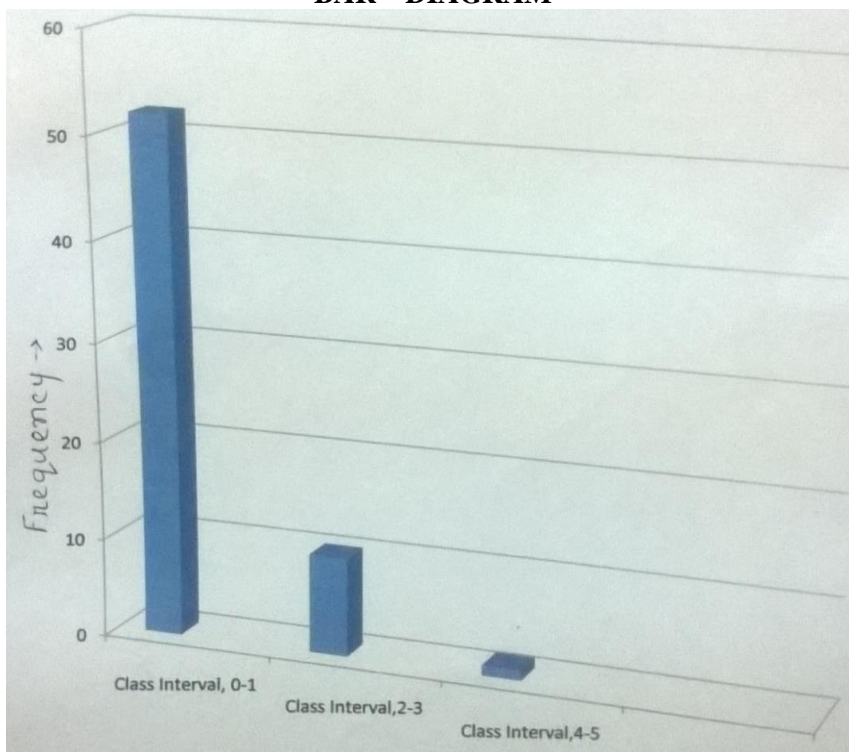


1st Qtr – 297.14^o

2nd Qtr – 57.14^o

3rd Qtr – 5.72^o

BAR – DIAGRAM



**Data Collected From Public High School, Malua
Marks of Geometry (Class - Ix)
Total Marks – 25**

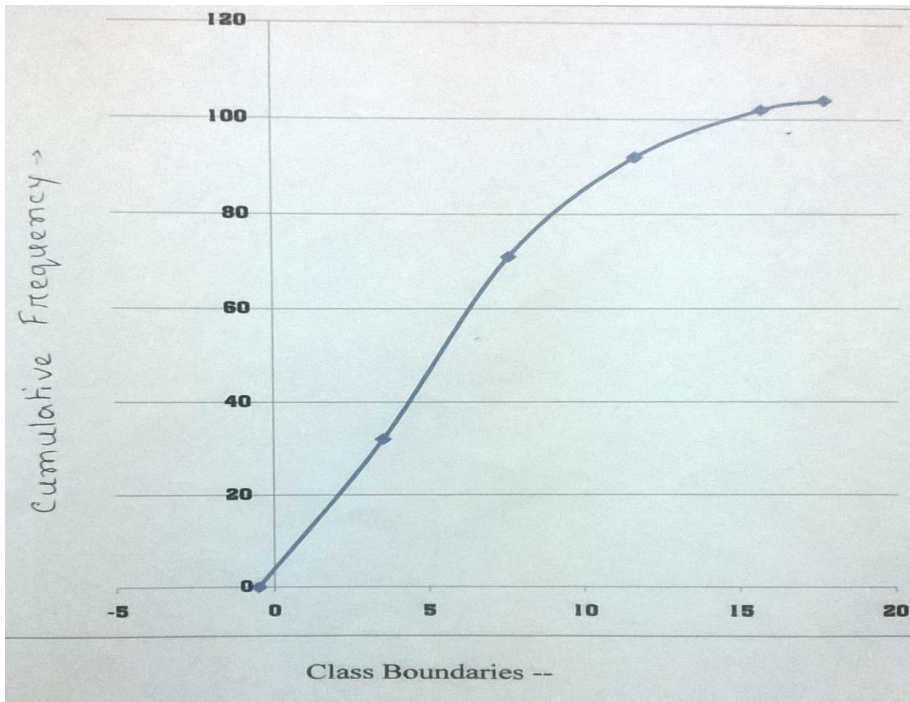
Serial No.	Marks	Serial No.	Marks
1	17	53	4
2	16	54	1
3	14	55	7
4	15	56	6
5	15	57	5
6	13	58	3
7	12	59	5
8	14	60	2
9	14	61	4
10	11	62	4
11	11	63	2
12	15	64	3
13	12	65	3
14	12	66	3
15	10	67	2
16	7	68	6
17	9	69	7
18	9	70	7

19	8	71	6
20	10	72	1
21	11	73	0
22	11	74	3
23	6	75	6
24	7	76	5
25	8	77	2
26	7	78	4
27	7	79	4
28	10	80	6
29	7	81	5
30	11	82	1
31	8	83	4
32	11	84	7
33	6	85	6
34	6	86	4
35	10	87	5
36	10	88	0
37	8	89	4
38	9	90	3
39	8	91	4
40	8	92	2
Serial No.		Serial No.	
Marks		Marks	
41	3	93	1
42	8	94	2
43	3	95	2
44	7	96	1
45	7	97	3
46	6	98	2
47	4	99	1
48	5	100	1
49	5	101	0
50	4	102	1
51	2	103	1
52	3	104	0

Tabular Form Of Collected Data From Public High School Malua:

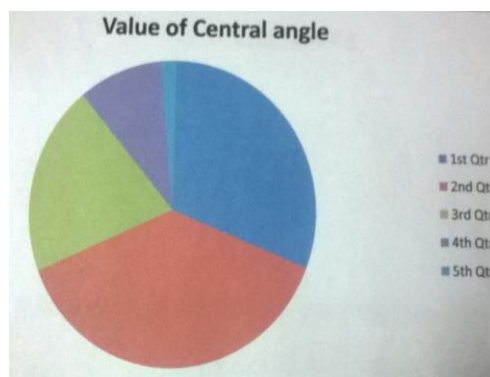
Sl. No.	Class Interval	Class Boundary	Mid Value	Frequency	Cumulative Frequency
1	0 -3	-0.5- 3.5	1.5	32	32
2	4-7	3.5-7.5	5.5	39	71
3	8-11	7.5-11.5	9.5	21	92
4	12-15	11.5-15.5	13.5	10	102
5	16-19	15.5-19.5	17.5	2	104

OGIVE



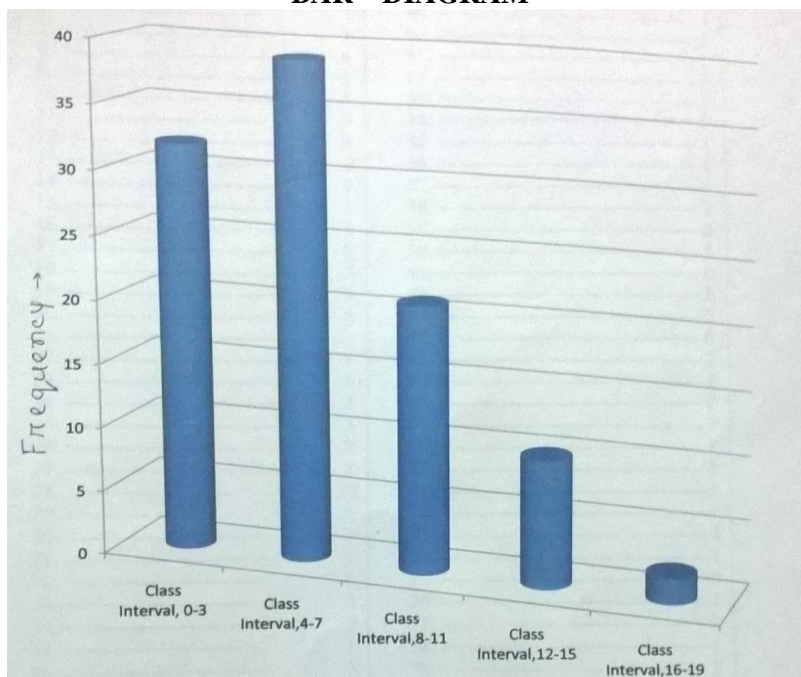
PIE – DIAGRAM

MARKS	Value of central angle
0 -3	$(32/104) \times 360^{\circ} = 110.77^{\circ}$
4-7	$(39/104) \times 360^{\circ} = 135^{\circ}$
8-11	$(21/104) \times 360^{\circ} = 72.69^{\circ}$
12-15	$(10/104) \times 360^{\circ} = 34.62^{\circ}$
16-19	$(2/104) \times 360^{\circ} = 6.92^{\circ}$



- 1st Qtr – 110.77^o
- 2nd Qtr – 135^o
- 3rd Qtr – 72.69^o
- 4th Qtr – 34.62^o
- 5th Qtr – 6.92^o

BAR – DIAGRAM



**Data Collected From Karnamadhur High School
Marks of Geometry (Class - Ix)
Total Marks – 25**

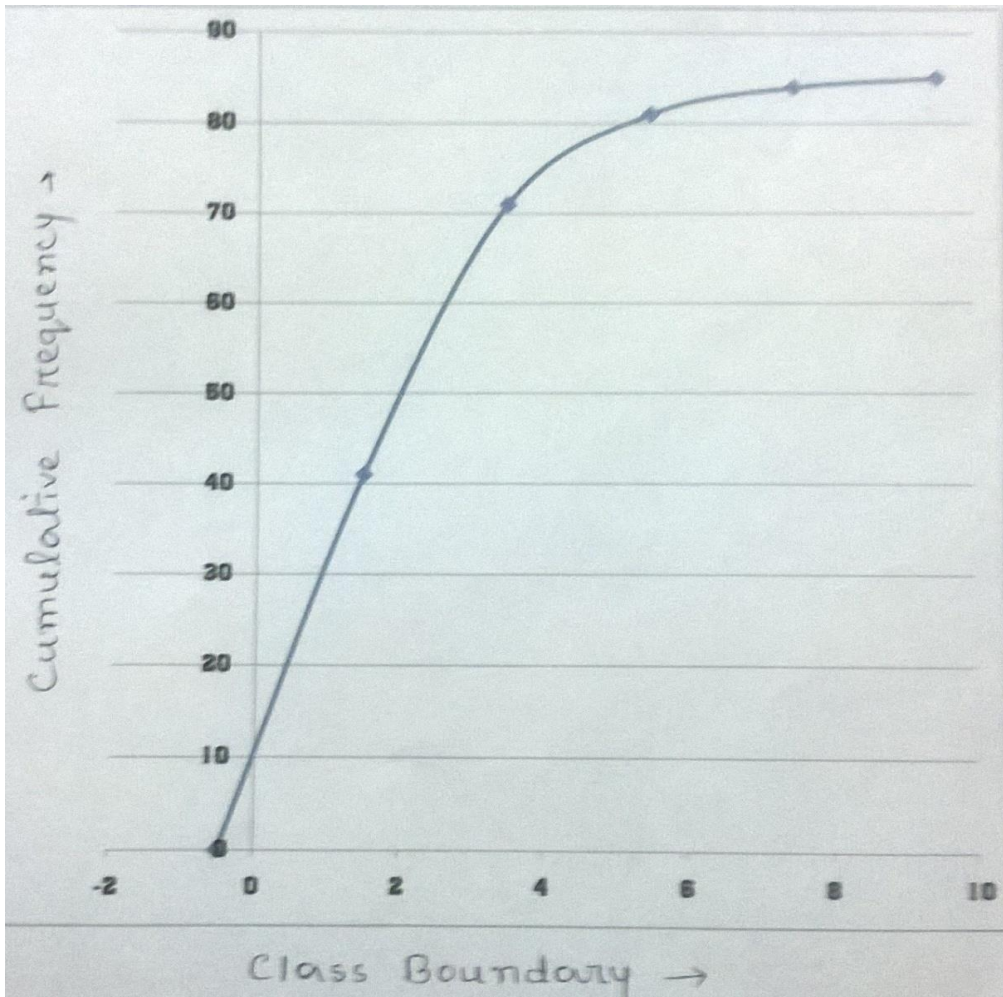
Serial No.	Marks	Serial No.	Marks
1	8	45	0
2	7	46	1
3	6	47	1
4	6	48	1
5	5	49	1
6	5	50	2
7	4	51	1
8	4	52	3
9	3	53	1
10	5	54	0
11	-5	55	1
12	3	56	1
13	2	57	1
14	3	58	2
Serial No.	Marks	Serial No.	Marks
15	5	59	2
16	4	60	1
17	2	61	0
18	3	62	1
19	3	63	2

20	5	64	0
21	3	65	2
22	3	66	3
23	4	67	2
24	2	68	2
25	3	69	1
26	2	70	0
27	2	71	1
29	2	72	1
30	3	73	1
31	3	74	1
32	1	75	0
33	0	76	1
34	1	77	0
35	3	78	1
36	1	79	1
37	3	80	0
38	2	81	1
39	2	82	0
40	1	83	0
41	1	84	0
42	0	85	0
43	1		
44	1		

TABULAR FORM OF DATA COLLECTED FROM KARNAMADHUR HIGH SCHOOL

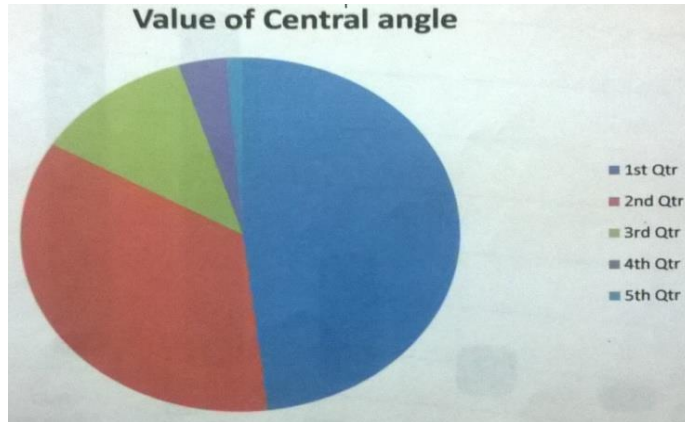
Sl. no.	Class interval	Class boundary	Mid value	frequency	Cumulative frequency
1	0 -1	-0.5- 1.5	0.5	41	41
2	2-3	1.5-3.5	2.5	30	71
3	4-5	3.5-5.5	4.5	10	81
4	6-7	5.5-7.5	6.5	3	84
5	8-9	7.5-9.5	8.5	1	85

OGIVE



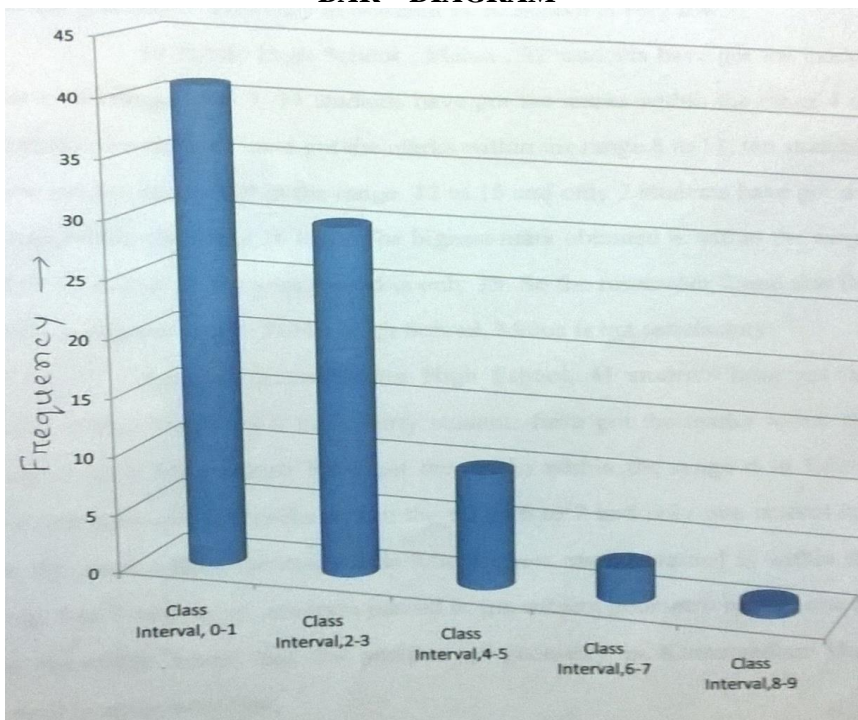
PIE - DIAGRAM

MARKS	Value of central angle
0 -1	$(41/85) \times 360^{\circ} = 173.65^{\circ}$
2-3	$(30/85) \times 360^{\circ} = 127.05^{\circ}$
4-5	$(10/85) \times 360^{\circ} = 42.35^{\circ}$
6-7	$(3/85) \times 360^{\circ} = 12.70^{\circ}$
8-9	$(1/85) \times 360^{\circ} = 4.25^{\circ}$



1st Qtr – 173.65°
 2nd Qtr – 127.05°
 3rd Qtr – 42.35°
 4th Qtr – 12.70°
 5th Qtr – 4.25°

BAR – DIAGRAM



From graph it is found that in Nilmoni H.S. School 52 students have got either 0 or 1 only, only 10 students have got either 2 or 3 and one student has got either 4 or 5. So highest mark obtained is within the range 4 to 5 and no. of students passed in the subject geometry is zero. So the researcher found that the position of geometry in Nilmoni H.S. School is very low.

In Public High School, Malua, 32 students have got the marks within the range 0 to 3, 39 students have got the marks within the range 4 -7, 21 students have got the marks within the range 8

- 11, 10 students have got the marks within the range 12 -15, and only 2 students have got marks within the range 16 – 19. The highest mark obtained is within the range 16 to 19 and no. of students passed is only 33. So the researcher found that the position of geometry in Public High School Malua is not satisfactory.

Again in Karnamadhur High School, 41 students have got the marks within the range 0 to 1, 30 students have got the marks within the range 2 - 3, 32 students have got the marks within the range 0 to 3, 10 students have got the marks within the range 4 - 5, 3 students have got the marks within the range 6 - 7, and only one student has got the mark within the range 8 - 9. So highest mark obtained is within the range 8 - 9 and no. of students passed in the subject geometry is only 1. So, the researcher found that the position of geometry in Karnamadhur High School is very low.

Thus, the researcher concluded that the achievement in the geometry is very poor.

Summary, Findings and Conclusion: The summary is important in that it places the whole study in perspective. It is the section which states the conclusions for this; it is the section that represents what the study has to contribute to the representation of present position of geometry at secondary school level. The conclusions are the expressions of the investigators personal interpretations of what he has concerned. The object is to establish a clear cut answer to the questions posed in the statement of the problem, in terms of the data of the present study, analyzed in the light of the student and of the work of investigation. The investigation here must maintain his objectivity.

The entire study can be summarized as the position of geometry in secondary school level is very low. Though geometry is an important part of mathematics, but student achievement in geometry is not satisfactory. In most of the school's students get the marks within the range 0 to 12 or 0 to 13. The average marks in geometry achieved by students are 2 to 3.

So, it can be concluded that most of the students are too much weak in the subject geometry and they should be encouraged by the teachers, parents and community so that they can be made interested in geometry and they can achieve a high position in the subject geometry.

After doing the said project work on "Present Status of Geometry at Secondary School Level of Karimganj District" it can be clearly concluded that the position of geometry at secondary school level is not at all expected. It is possible to find out the reasons for which geometry is not interesting to the students. The said project work enables us to know the reasons for which geometry is not so popular at secondary school level. Frequent supervision and inspection by the teachers and parents should be carried out in order to see and assess the teaching of subject geometry. Parents should be enlightened on the importance of their involvement in the education of their children and its attendant benefit in the performance of students. Good school-community relationship should be developed and maintained in order to enjoy its attendant benefits which ultimately will lead to improvement in performance of students in geometry and other subjects. Guidance and counseling units should be set up in our secondary schools and they should be guiding and counseling students on the educational, personal and social issues affecting students. This will definitely help them to change their view with regard to geometry and can help in improving their performance in geometry.

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