

# Attitude of secondary level students towards geometry

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## ABSTRACT

*Geometry, the study of space and spatial relationships, is an important and essential branch of mathematics. The present investigation has been conducted to study the attitude of secondary level students towards geometry. Sample of the study was 429 secondary students under Purulia district, West Bengal, India. The survey method has been adopted for the present study and stratified random sampling technique has been used in selecting the samples. ANOVA and 't' test has been applied for the interpretation of the findings. The results reveal that residential place plays a significant role in attitude towards geometry whereas gender does not differ significantly in attitude towards geometry of secondary school students.*

**Keywords:** Geometry, attitude, boys, girls, residential background, ANOVA, 't'- test

**1. Introduction:** - Geometry is a vibrant and exciting part of mathematics and a key to understanding our world through concrete experiences with geometric figures and relationship. Geometry is the study of size, shape and position of two dimensional shapes and three dimensional figures. Geometry is science of shape and extent. Geometry knowledge is very useful not only inside the school but also outside the school. Geometry develops the reasoning and logical thinking of the child. Geometry plays a vital role in everyday life. It is found everywhere in art, architecture, space, engineering, sports, machines etc. Many students perform poorly in geometry and find the subject very difficult and uninteresting. Student faces different types of problems in learning geometry. Geometry is our human heritage from all cultures (**Hartfield, Bitter, 1997**). Geometry knowledge is very useful to solve everyday life problems like measurement of lengths, drawing, reading maps, etc. (**Bussi&Boero, 1998; Kenney, Bexzuska, &Martin, 1992**). The National Council of Teachers of Mathematics (**NCTM, 2000**) has emphasized the importance of geometry in school mathematics by stating, "Geometry and spatial sense are fundamental components of mathematics learning. They offer ways to interpret and reflect on our physical environment" .Geometry has been identified as an important source of mathematical thinking (**Hogan, 2000**). According to (**Baykul, 2005**) geometry has taken place in curriculums since elementary education because of contributing development of students' critical thinking and problem solving activities ,being an important area of mathematics that is used in daily life, helping students to realize the world around themselves and appreciate the worth of their world.

## 2. Literature Review:-

**Hyde, Fennemaa and Lamon (1990)** found that a few gender differences manifest themselves already in elementary school geometry. The attitude of pupils can be influenced by the attitudes of the teacher and his/her method of teaching. Studies done by the **Thompson(1993)** had shown that the teachers' method of geometry teaching and his/her personality greatly accounted for the students positive attitude towards geometry and that without interest and personal effort in learning geometry by the pupils, they can hardly perform well in the topic. **Geddes and Fortunato (1993)** had shown that many students encounter difficulties and performed poorly in geometry. **Mogari(1999)** examined four components of attitudes in the attempt to investigate more components of attitude in Euclidean Geometry. These were enjoyment, motivation, perception of the importance of geometry and freedom from fear of geometry. He showed that there were very weak relationship between achievement and each of the four variables mentioned above. **Baharvand (2001)** also found out that males perform better than females on geometry problems and that in many cases, tests themselves affect the students' performance rather than the students' attitudes or compared to their female counterparts in mathematics particularly in geometry. Attitude towards mathematics plays a crucial role in the teaching and learning processes of mathematics. It affects student's achievement in mathematics (**Farooq & Shah, 2008**).**Sunzuma, G.; Masocha, M.&Zezekwa N.(2013)** conducted a study on secondary school students' attitudes towards their learning geometry :a survey of Bindura urban secondary schools. He had shown that the majority of the students in Bindura urban did not like solving geometrical problems. It also emerged that geometry is not a difficult topic to both male and female students and that though most students did not like solving geometry. **Jayeeta Bhattacharjee (2016)** conducted a study on present status of geometry at secondary school level of Krimganj district. Here

shown 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 make interested in geometry.

### 3. Statement of the problem:-

“Attitude of secondary level students towards geometry of Purulia District”

### 4. Objectives of the study:-

The researcher considered the followings as the objectives of the study:

- i) To study the difference in attitude of secondary school students towards geometry with regard to gender.
- ii) To study the difference in attitude of secondary school students towards geometry with regard to residence.
- iii) To study the interaction effect between gender and residential background.

### 5. Hypotheses of the study:-

The following hypothesis has been made by the researcher for the study:

Ho.1: There exist no significant differences of attitude towards geometry between boys and girls students of secondary school.

Ho.2: There exist no significant differences of attitude towards geometry between urban and rural students of secondary school.

Ho.3: There exist no significant interaction effect between gender and residential background of secondary level students towards geometry.

### 6. Variables of the study:-

**Dependent variable:** - Attitude

**Independent variable:** - Gender, residential background

### 7. Sample of the study:-

429 secondary level students randomly selected from Bengali medium school in the district of Purulia in W.B was considered and stratified random sampling was used for sample selection .The distribution of the samples has been presented Table -1

**Table 1: showing the distribution of sample**

Localities	Boys	Girls	Total
Rural	114	120	234
Urban	90	105	195
Total	204	225	429

**8. Tools of the study:** Attitude of secondary level students towards geometry scale developed by the investigators has been used for collecting data for this study. The scale which consists of 15 items was constructed by making use of Likert's methods of summation to get a five point judgment on each item. Against each statement, five alternative responses, namely, “Strongly Agree” (SA), “Agree” (A), “Undecided” (U), “Disagree” (D) and “Strongly Disagree” (SD) were given. Weights of 5,4,3,2 and 1 were given for favorable statements and the scoring system is reversed for unfavorable statements. A schedule was added in the beginning of the questionnaire in order to get information about sex and residential background.

### 9. Analysis:-

#### 9.1. Descriptive statistics

Descriptive statistics can reduce lots of data into a small summary .For this study descriptive data in the form of mean and standard deviation (SD) along with 't' critical ratio is presented in Table 2.

**Table 2.Descriptive data along with 't' critical ratio**

Pair of comparison	N	Mean	SD	df	t -value
Boys	204	68.85	3.732	427	1.016
Girls	225	68.41	5.171		
Urban	195	70.04	4.431	427	6.111*
Rural	234	67.44	4.303		

\*Significant at 0.05 level

## 9.2. Inferential statistics

Inferential statistics plays a pivotal role in hypothesis testing where it is used to determine if a null hypothesis can be rejected or retrained. For the present study we have constructed a **two way (2×2) factorial design** for the analysis of different variables (Table 3).

**Table: 3.summary of ANOVA results**

Source of variation	SS	df	MS	F ratio
A(Gender)	14.971	1	14.971	0.806
B(Residence)	678.267	1	78.267	36.536*
A×B	205.283	1	205.283	11.058*
Within group	7889.868	425	18.564	

\*Significant at 0.01 level

## 10. Results and Discussion:-

### 10.1. Testing of Ho.1

The mean of attitude score for boys and girls of secondary school is found to be **68.85(SD=3.732)** and **68.41(SD=5.171)** respectively. F value (Table 3) for gender is found to be **0.806** which is not significant at 0.01 level. Moreover, 't' value (Table 2) between boys and girls students is found to be **1.016** which is also not significant even at 0.05 levels. In view of the above Ho.1 is accepted.

### 10.2. Testing of Ho.2

The ANOVA analysis revealed that there is statistically significant ( $p < 0.01$ ) differences in attitude towards geometry of secondary level students according to the places they are born and brought up (Table 3). Furthermore, 't' values ( $t = 6.111$ ) also supports this findings. Thus, Ho.2 is rejected.

### 10.3. Testing of Ho.3

Two independent variables interact if the effect of one of the variables differs depending on the level of the other variables. In this we considered these independent variables namely gender and residence. So we have to examine whether there is any interaction present or not. From Table 3 it is noticed that gender and residential background interact with each other at 0.01 level of significance. Hence, Ho.3 is rejected.

## 11. Conclusion and recommendations:-

This research is accomplished on the students of secondary level to investigate the attitude towards geometry. Results of the present study demonstrate that there is no significant relationship in that secondary school students both boys and girls students and have almost the same attitude towards geometry. The research idea is to find out significant differences of attitude towards geometry between urban and rural students. Urban students have higher positive attitude towards geometry as compared to rural students. The schools and educational institutions should take measures to improve the attitude towards geometry. Studies of socio-economic and other important parameters of secondary school students in the district of Purulia in West Bengal may accomplish further these findings from this particular study.

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