

# *Influence of Social Stratification on Senior Secondary Students' Motivation and Achievement in Plane Geometry*

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**Abstract** – The study investigated the influence of social stratification on senior secondary students' motivation and achievement in plane geometry. The study adopted the analytical survey research design. The population of the study consisted of 10,117 senior secondary students in fifteen (15) public senior secondary schools in Port Harcourt city local government area of Rivers State. A sample of 384 senior secondary class one students and fourteen public senior secondary schools obtained from the populations using Taro Yamane formula were selected by simple random sampling and used for the study. Two instruments were used for data collection: Social Stratification and Plane Geometry Motivation Questionnaire (SSPGMQ) and Plane Geometry Achievement Test (PGAT). The face and content validities of SSPGMQ and PGAT were established by three authorities (experts) in Mathematics Education. The reliabilities of SSPGMQ and PGAT were established using test-retest method and the reliability indices of 0.92 and 0.74 were obtained for SSPGMQ and PGAT respectively. The four research questions and four hypotheses which guided the study were answered using mean and standard deviation and Analysis of Variance (ANOVA) respectively at 0.05 levels of significance. Findings of the study revealed that social stratification had no significant influence on students' motivation towards learning plane geometry but there was significant effect of social stratification on students' plane geometry achievement in favour of students from low social stratum. The study recommended that students should be intrinsically motivated and determined to learn plane geometry irrespective of their social stratification. Students from high social stratification should be encouraged by their teachers and parents to improve their study habit and enhance their Mathematics performance like their counterparts from low social stratification.

**Keywords** – Influence, Social Stratification, Motivation, Achievement, Plane Geometry.

## **I. INTRODUCTION**

The popular saying that all fingers are not equal is true in all human society. In all societies, people differ from one another on the basis of their age, sex and personal characteristics. Human society is not homogenous. Apart from the natural differences, human beings are also differentiated according to socially approved criteria. Men and women are socially differentiated in terms of rewards like status, power, education, income, and so on. This social difference in our society is called social inequality. Social inequality refers to the existence of socially created differences. Different societies have different ways of

differentiating people. In all complex societies, the total stock of valued goods or national wealth is distributed unequally, with the most privileged individuals enjoying a disproportionate share of income, power, wealth and other valued resources. This social inequality among individuals in the society due to wealth, power and prestige is termed social stratification. Social stratification refers to the complex social institutions that generate observed inequalities in income, power and other valuable resources. It is the division of society into different social, economic and educational strata or layer.

Social stratification refers to a system by which a society ranks categories of people in a hierarchy. In Nigeria, it is perfectly clear that some people and states of the federation have greater status, power and wealth than others. The national allocations are shared unevenly depending on the states that contribute more to the common wealth of the Nigerian nation. These differences led to social stratification. Okoh (2014) defined social stratification as the hierarchical organization that is to be found in any society on unequal distribution of wealth, power and prestige among groups and individuals in the society. Azikwe (2015) asserted that social stratification leads to social inequality or social differentiation which arises from either inherited or acquired differences or both. It is a process whereby people are placed in different heights of the social ladder. In every society some men are identified as superior and others as inferior, patricians and plebeians, aristocrats and commoners, masters and slaves, the privilege and underprivileged. Some individuals are likely to be rich, while others are poor.

Social stratification is the aspect of inequality in society in terms of services, rights, obligation, power and prestige or status. Uche (2008) also referred to it as the process by which people are judge relative to their worth, value, rating and ranking in terms of social levels and hierarchy. Social stratification is a general term used to cover all types of systematic social inequality found in different societies and in different historical periods. Although there are some situations in which a child from a high socio-economic home with all the encouragement and extrinsic motivation might be a drop-out, just as some children from low socio-economic status families could be intrinsically motivated and would work so hard to make it at school irrespective of their poor home background (Omosewo, 2016). It appears therefore, that social stratification, motivation and academic achievement are interrelated. This is the fact this study intends to establish. Herbert (2018) reported that social stratification or socioeconomic status greatly impacts child development and student achievement outcomes. Social stratification and student motivation have significant effects on student's ability to attain academically and have successful peer and teacher-student relationship (Herbert, 2018).

Motivation is the natural human capacity to direct energy in pursuit of a goal. Motivation is defined as a force that stimulates, directs, and sustains behavior (Owolabi & Ogini, 2013). Students' motivation, on the other hand, or motivation to learn, is defined as the tendency of a student to find academic activities meaningful and worthwhile and to try to derive the intended academic benefits from them (Itedjere, 2014). Motivation is vital to learning. Some researchers have gone as far as saying even that without motivation, appropriate curricula and good teaching are not enough to ensure students' achievement. According to Omiebi-Davis (2011), motivation is that which gives people the ability to go on when all else around them make them want to let go. Motivation gives us the determination to succeed, especially in difficult and challenging circumstances. Obidi (2015) defined motivation as an energizing force that includes action. The context of the force and

of the action is also integral to an understanding of motivation in a particular social, cultural and educational setting.

Researchers have examined motivation within the framework of socio-cultural theory and valorizing the specific context and history of the participants, as well as emotional aspects of motivation (Ushioda, 2006). Agogo (2012) found out that the self-determination model of motivation with its categories of intrinsic motivation (coming from the activity itself) and extrinsic motivation (coming from external sources) was applicable to a study of motivation. Adeyemo (2016) suggested that there are four types of extrinsic motivation requiring varying levels of self-determination. The level requiring the least self-determination is external regulation, that is, motivated by rewards and punishments provided by others. The second level is interjected regulation, which is when an action is performed to avoid feeling pressure or anxiety. The third level is identification regulation, where the learner has identified a goal as being important to him in a personal sense and the type of motivation requiring the most self-determination is integrated regulation, where the learners want to achieve an academic goal because it represents their sense of self, their values and beliefs.

Academic achievement refers to achievement made in learning. Lingbawan (2011) described academic achievement as the achievement by an individual, of the objectives related to various types of knowledge and skills which are socially established based on the age, prior learning and capacity of the individuals with regard to education, socialization and qualification. Research reports revealed that academically successful students will have better opportunities than those with less education and that adults with high levels of education are more likely to be employed and to earn higher salaries (Lingbawan, 2011). Beyond work and wages, academic success is important because working citizens of any country will need higher levels of education to tackle the technological demanding occupations of the future (Brockma&Russell, 2009). There are factors that affect student academic achievement, which include: socio-economic background, medical/health issue, family background, student-teacher relationship, teacher qualification, school expectations, students' motivation, and sociological foundations among others. According to Ceci (2011), it is generally acknowledged that family environment is the most powerful influence in determining a child's academic motivation and achievement. Ceci (2011) stated that the efficacy of a family influence for students' academic success is determined to a large extent by a family background. The author observed that parent-child interactions are the forces that lead to academic achievement. It is therefore imperative that parents provide stimulating, supportive, and language-rich experiences for their children.

Motivation is another important factor that determines students' academic achievement. It is generally recognized that motivation and academic achievement among younger children are contingent to some degree on grade and age-related factors. Lingbawan, (2011) made a strong case for strengthening the degree of intrinsic motivation children feel for learning. Lingbawan,

(2011) however maintained that there are many benefits to maximizing intrinsic motivation, many ways to foster it, and some techniques that promote intrinsic motivation. The author observed that intrinsic motivation is rarely found in students of nowadays. Students are intrinsically motivated to work when the threat of negative external evaluation is not relevant and when their attention is not focused on extrinsic reasons for completing tasks. They will also feel more competent and proud, and thus more intrinsically interested in tasks, when they can take responsibility for their success. Allowing students' choice enhances intrinsic interest in school tasks, and it teaches self management skills that are essential for success in higher grades and the workplace. It is impossible for children to develop autonomy and a sense of responsibility if they are always told what to do, how and when to do it (Edelin, 2014). Edelin (2014) therefore argued in favour of lead management which involves empowering children to be responsible for their own needs and accomplishment and teaching them in cooperative groups.

Students' motivation is crucial for effective Mathematics learning. Geometry is one of the five themes of the senior secondary Mathematics education curriculum with the content of plane and solid geometry (Nigeria Educational Research and Development Council, 2012). Plane geometry is an aspect of geometry which deals with the study of two-dimensional shapes. Plane geometry deals with shapes with length and breadth only. Plane geometry is different from solid geometry which are figures having length, breadth and width. Examples of plane geometry are triangle, circle, square, rectangle, kite, rhombus, trapezium, parallelogram and polygons. Geometry arose independently in a number of early cultures as a practical way for dealing with

lengths, areas, angles and others. While geometry has evolved significantly throughout the years, there are some general concepts that are more or less fundamental to geometry. These include the concepts of points, lines, planes, surfaces, angles, and curves, as well as the more advanced notions of manifolds and topology or metric. Geometry has applications in many fields including: Art, Architecture, Engineering, Physics, and other branches of Mathematics. Plane geometry enables learners to understand the world around them, and construct structures for the development of the society and improvement of their daily living. The study therefore aimed at investigating the influence of social stratification on senior secondary students' motivation and achievement in plane geometry in Port Harcourt city local government area of Rivers State.

## II. STATEMENT OF THE PROBLEM

General Mathematics is one of the core or compulsory subjects in the senior secondary or post-basic education in Nigeria. It occupies a very sensitive position in all science, technology and engineering oriented courses and plays important role in the day-to-day activities of man. Students whose choice of career is in the sciences, engineering and other related fields of study must pass Mathematics at least at credit level in senior secondary certificate examination. However, the chief examiner's reports of the West African Senior Secondary Certificate Examination (WASSCE) between 2013 and 2018 examination years revealed that only 41.51% of the candidates obtained credit pass and above (C6-A1) in General Mathematics (See Table 1). The report showed that 58.49% of the total candidates who sat for the examination failed having obtained pass and below (D7-F9).

Table 1: WASSCE Mathematics result between 2013 and 2018 years

| S/N | Year    | Total number of Candidate who Sat for exam. | Number of candidates With credit pass and above (C6-A1) | Percentage (%) of candidate with credit pass and above (C6-A1) |
|-----|---------|---------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------|
| 1.  | 2013    | 1,543,683                                   | 555,726                                                 | 36.00                                                          |
| 2.  | 2014    | 1,692,435                                   | 529,732                                                 | 31.00                                                          |
| 3.  | 2015    | 1,593,442                                   | 544,638                                                 | 34.18                                                          |
| 4.  | 2016    | 1,544,234                                   | 597,30                                                  | 38.68                                                          |
| 5.  | 2017    | 1,559,162                                   | 923,486                                                 | 59.22                                                          |
| 6.  | 2018    | 1,572,396                                   | 786,016                                                 | 49.98                                                          |
|     | Average |                                             |                                                         | 41.51                                                          |

Source: Test Development Division (2018), West African Examination Council (WAEC), Lagos

In an effort to identify the causes of this high failure rate in Mathematics, researchers identified several variables such as learners' abilities and attitudes, deficiency in basic mathematical skills, student-teacher relationship, student-teacher ratio, poor instructional strategies and materials, self perception, family background and motivation. To add to the list, this study intends to investigate the influence of social stratification on senior secondary students' motivation and achievement in plane geometry. Hence,

the question begging for an answer in this study is: What is the influence of social stratification on senior secondary students' motivation and achievement in plane geometry?

## III. AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to investigate the influence of social stratification on senior secondary students' motivation and

achievement in plane geometry in Port Harcourt city local government area of Rivers State. The objectives of the study are to:

1. determine the influence of social stratification on students' motivation towards learning plane geometry.
2. investigate the effect of social stratification on students' plane geometry achievement.
3. ascertain the impact of social stratification on the male and the female students' motivation towards learning plane geometry.
4. find out the effect of social stratification on the male and the female students' plane geometry achievement.

### **IV. RESEARCH QUESTIONS**

The following research questions guided the study:

1. What is the difference in the motivation mean scores of students from low and high social strata in learning plane geometry?
2. What is the difference in the achievement mean scores of students from low and high social strata in plane geometry?
3. What is the difference in the motivation mean scores of students from low and high social strata in learning plane geometry by gender?
4. What is the difference in the achievement mean scores of students from low and high social strata in plane geometry by gender?

### **V. HYPOTHESES**

To guide the study, the following null hypotheses were formulated and tested at 0.05 levels of significance:

1. There is no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry.
2. There is no significant difference between the achievement mean scores of students from low and high social strata in plane geometry.
3. There is no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry by gender.
4. There is no significant difference between the achievement mean scores of students from low and high social strata in plane geometry by gender.

### **VI. METHODOLOGY**

The study adopted the analytical survey research design. The population of the study consisted of 10,117 senior secondary students in fifteen (15) public senior secondary schools in Port Harcourt city local government area of Rivers State (Rivers State Senior Secondary Schools Board, 2018). A sample of 384 senior secondary class one students and fourteen public senior secondary

schools obtained from the populations using Taro Yamane formula were selected by simple random sampling and used for the study. A sample of twenty seven (27) students was randomly selected from each school involved in the study. Two instruments were used for data collection: Social Stratification and Plane Geometry Motivation Questionnaire (SSPGMQ) and Plane Geometry Achievement Test (PGAT). SSPGMQ had section A and B. Section A elicited data on students' demographic data and social stratification using parental socio-economic status. Parents' occupations were used to categorize students into low or high socio-economic status or social stratification. Students who indicated their parents' occupations as petty traders, peasant farmers, junior civil servants, fishermen or low income earners were categorized as students from low social stratum while students who indicated their parents' occupation as politicians, businessmen, senior civil servants, commercial farmers or high income earners made up the high social stratum. Section B of the SSPGMQ instrument consisted of 20 items Plane Geometry Motivation Questionnaire (PGMQ) structured after Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). A mean criterion cut-off mark of 2.50 was used to ascertain students with low and high motivation towards leaning geometry. Students' with motivation mean scores below 2.50 had low motivation while those with 2.50 motivation mean score and above had high motivation. The grand motivation mean scores for students from low and high social strata were obtained respectively and used for data analysis.

The second instrument PGAT consisted of twenty multiple choice objective questions. Each question has four options lettered A to D, with only one of the options as the correct answer. PGAT was used to collect data on students' cognitive achievement in plane geometry. A table of specification guided the construction of PGAT. Each test item was allotted (5) marks and the 20 items gave a total of 100 marks. The face and content validities of SSPGMQ and PGAT were established by three authorities (experts) in Mathematics Education. The experts' corrections were effected and the approved copies of the instruments were administered to the respondents. The reliabilities of SSPGMQ and PGAT were established using test-retest method. The test and re-test scores of thirty respondents who were not part of the sample of the study were correlated using the Pearson's Product Moment Correlation (PPMC) and the reliability indices of 0.92 and 0.74 were obtained for SSPGMQ and PGAT respectively. SSPGMQ and PGAT were administered by the researchers to the respondents with the permission of the Principals of the schools and with the assistance of the Mathematics teachers. The instruments were retrieved the same day from the respondents. The PGAT was marked by the researchers. Data obtained from SSPGMQ and PGAT were coded and used for analysis. The data obtained were analyzed using Statistical Package for Social Sciences (SPSS) version 21. The research questions were answered using mean and standard deviation while Analysis of Variance (ANOVA) was used to test the hypotheses at 0.05 levels of significance.

## VII. RESULT PRESENTATION

**Research question one:** What is the difference in the motivation mean scores of students from low and high social strata in learning plane geometry?

Table 2: Mean and Standard Deviation (SD) of the motivation mean scores of students from low and high social strata in learning plane geometry

| Social Stratification | n   | Mean | SD   | Difference |      |
|-----------------------|-----|------|------|------------|------|
|                       |     |      |      | Mean       | SD   |
| Low                   | 234 | 2.86 | 1.08 | 0.11       | 0.07 |
| High                  | 150 | 2.75 | 1.01 |            |      |
| Total                 | 384 |      |      |            |      |

Table 2 showed that the motivation mean score of students from low social stratum (Mean=2.86; SD=1.08) was slightly higher than the motivation mean score of students from high social stratum (Mean=2.75; SD=1.01). The difference in the motivation mean scores of students from low and high social strata in learning plane geometry was (Mean=0.11; SD=0.07).

**Research question two:** What is the difference in the achievement mean scores of students from low and high social strata in plane geometry?

Table 3: Mean and standard deviation of the achievement mean scores of students from low and high social strata in plane geometry

| Social Stratification | n   | Mean  | SD    | Difference |      |
|-----------------------|-----|-------|-------|------------|------|
|                       |     |       |       | Mean       | SD   |
| Low                   | 234 | 40.21 | 18.22 | 0.48       | 1.00 |
| High                  | 150 | 39.73 | 19.26 |            |      |
| Total                 | 384 |       |       |            |      |

Table 3 showed that the achievement mean score of students from low social stratum (Mean=40.21; SD=18.22) was slightly higher than the achievement mean score of students from high social stratum (Mean=39.73; SD=19.26). The difference in their achievement mean scores in plane geometry was (Mean=0.48; SD=1.00).

**Research question three:** What is the difference in the motivation mean scores of students from low and high social strata in learning plane geometry by gender?

Table 4: Mean and standard deviation of the motivation mean scores of students from low and high social strata in learning plane geometry by gender

| Social Stratification | n   | Male |      | n   | Female |      | Difference |      |
|-----------------------|-----|------|------|-----|--------|------|------------|------|
|                       |     | Mean | SD   |     | Mean   | SD   | Mean       | SD   |
| Low                   | 105 | 2.97 | 1.09 | 129 | 2.87   | 0.95 | 0.10       | 0.14 |
| High                  | 73  | 2.84 | 1.01 | 78  | 2.82   | 0.98 | 0.02       | 0.03 |
| Total                 | 178 |      |      | 207 |        |      |            |      |

Table 4 showed that the motivation mean score of the male students from low social stratum (Mean=2.97; SD=1.09) was slightly higher than the motivation mean score of the female students from the same social stratum (Mean=2.87; SD=0.95). The difference in the motivation mean scores of the male and female

students from low social stratum in learning plane geometry was (Mean=0.10; SD=0.14). Table 4 also showed that the motivation mean score of the male students from high social stratum (Mean=2.84; SD=1.01) was slightly higher than the motivation mean score of the female students from the same social stratum

(Mean=2.82; SD=0.98). The difference in the motivation mean scores of the male and female students from high social stratum in learning plane geometry was (Mean=0.02; SD=0.03).

**Research question four:** What is the difference in the achievement mean scores of students from low and high social strata in plane geometry by gender?

Table 5: Mean and standard deviation of the achievement mean scores of students from low and high social strata in learning plane geometry by gender

| Social Stratification | n   | Male  |      | Female |       | Difference |      |
|-----------------------|-----|-------|------|--------|-------|------------|------|
|                       |     | Mean  | SD   | n      | Mean  | SD         | Mean |
| Low                   | 105 | 60.08 | 8.48 | 129    | 57.26 | 6.19       | 2.82 |
| High                  | 73  | 58.22 | 5.54 | 78     | 57.23 | 5.60       | 0.99 |
| Total                 | 178 |       |      | 207    |       |            | 0.06 |

Table 5 showed that the achievement mean score of the male students from low social stratum (Mean=60.08; SD=8.48) was slightly higher than the achievement mean score of the female students from the same social stratum (Mean=57.26; SD=6.19). The difference in the achievement mean scores of the male and female students from low social stratum in learning plane geometry was (Mean=2.82; SD=2.29). Table 5 also showed that the achievement mean score of the male students from high social stratum (Mean=58.22; SD=5.54) was slightly higher than the

achievement mean score of the female students from the same social stratum (Mean=57.23; SD=5.60). The difference in the achievement mean scores of the male and the female students from high social stratum in learning plane geometry was (Mean=0.99; SD=0.06).

**H<sub>01</sub>:** There is no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry.

Table 6: Summary of analysis of variance on the motivation mean scores of students from low and high social strata towards learning of plane geometry

|                | Sum of Squares | df  | Mean Square | F   | Sig. |
|----------------|----------------|-----|-------------|-----|------|
| Between Groups | 21.09          | 1   | 21.09       | .06 | .81  |
| Within Groups  | 132670.65      | 383 | 347.30      |     |      |
| Total          | 132691.74      | 384 |             |     |      |

Table 6 showed that there was no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry ( $F_{(1, 383)} = 0.06$ ,  $p > 0.05$ ). Therefore, the null hypothesis one was retained and the alternate hypothesis rejected.

**H<sub>02</sub>** There is no significant difference between the achievement mean scores of students from low and high social strata in plane geometry.

Table 7: Summary of analysis of variance on the achievement mean scores of students from low and high social strata in plane geometry

|                | Sum of Squares | df  | Mean Square | F    | Sig. |
|----------------|----------------|-----|-------------|------|------|
| Between Groups | 407.470        | 1   | 407.47      | 9.10 | .00  |
| Within Groups  | 17157.32       | 383 | 44.80       |      |      |
| Total          | 17564.79       | 384 |             |      |      |

Table 7 showed that there was significant difference between the achievement mean scores of students from low and high social strata in plane geometry ( $F_{(1, 383)} = 9.10$ ,  $p < 0.05$ ). Therefore, the null hypothesis two was rejected and the alternate hypothesis retained.

**H<sub>03</sub>:** There is no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry by gender.

Table 8: Summary of two-way analysis of variance on the motivation mean scores of students from low and high social strata in learning plane geometry by gender

| Source                      | Type III Sum of Squares | df  | Mean Square | F        | Sig. |
|-----------------------------|-------------------------|-----|-------------|----------|------|
| Corrected Model             | 556.021 <sup>a</sup>    | 3   | 185.34      | 4.15     | .01  |
| Intercept                   | 1237382.85              | 1   | 1237382.85  | 27717.64 | .00  |
| Social Stratification       | 81.55                   | 1   | 81.55       | 1.83     | .18  |
| Sex                         | 329.90                  | 1   | 329.90      | 7.39     | .01  |
| Social Stratification * Sex | 75.99                   | 1   | 75.99       | 1.70     | .19  |
| Error                       | 17008.77                | 380 | 44.64       |          |      |
| Total                       | 1321885.00              | 384 |             |          |      |
| Corrected Total             | 17564.79                | 383 |             |          |      |

a. R Squared = .032 (Adjusted R Squared = .024)

Table 8 showed that there was no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry by gender ( $F_{(1, 380)} = 0.19$ ,  $p > 0.05$ ) but the difference between the motivation mean scores of the male and the female students was significant ( $F_{(1, 380)} = 7.39$ ,

$p < 0.05$ ). Therefore, the null hypothesis three was retained and the alternate hypothesis rejected.

**H<sub>04</sub>:** There is no significant difference between the achievement mean scores of students from low and high social strata in plane geometry by gender.

Table 9: Summary of two-way analysis of variance on the achievement mean scores of students from low and high social strata in learning plane geometry by gender

| Source                | Type III Sum of Squares | df  | Mean Square | F       | Sig. |
|-----------------------|-------------------------|-----|-------------|---------|------|
| Corrected Model       | 424.75 <sup>a</sup>     | 3   | 141.58      | .41     | .75  |
| Intercept             | 582549.73               | 1   | 582549.73   | 1673.65 | .00  |
| Social Stratification | 36.18                   | 1   | 36.18       | .10     | .75  |
| Sex                   | 15.47                   | 1   | 15.47       | .04     | .83  |
| Social Stratum * Sex  | 338.58                  | 1   | 338.58      | .97     | .33  |
| Error                 | 132266.99               | 380 | 348.07      |         |      |
| Total                 | 747892.00               | 384 |             |         |      |
| Corrected Total       | 132691.74               | 383 |             |         |      |

a. R Squared = .003 (Adjusted R Squared = -.005)

Table 9 showed that there was no significant difference between the achievement mean scores of students from low and high social strata in learning plane geometry by gender ( $F_{(1, 380)} = 0.97$ ,  $p > 0.05$ ) and the difference between the achievement mean scores of the male and the female students was also not significant ( $F_{(1, 380)} = 0.04$ ,  $p > 0.05$ ). Therefore, the null hypothesis four was retained and the alternate hypothesis rejected.

## VIII. DISCUSSION OF FINDINGS

### Influence of social stratification on students' motivation towards learning plane geometry

Table 2 showed that the motivation mean score of students from low social stratum (Mean=2.86; SD=1.08) was slightly higher than the motivation mean score of students from high social stratum (Mean=2.75; SD=1.01). The difference in the motivation mean scores of students from low and high social strata in learning plane geometry was (Mean=0.11; SD=0.07). Table 6 showed that there was no significant difference between the motivation mean scores of students from low and high social strata in learning plane

geometry ( $F_{(1, 383)} = 0.06$ ,  $p > 0.05$ ). Therefore, the null hypothesis one was retained and the alternate hypothesis rejected. Findings of the study revealed that students from low and high social strata were highly motivated in learning plane geometry. Social stratification had no significant influence on students' motivation towards learning plane geometry. This finding corroborated with that of Lingbawan (2011), who posited that most students are motivated by their determination and not parental socio-economic status. Lingbawan (2011) reported that parental socio-economic status had no significant effect on motivation of students learning. Entwistle (2011) also found out that academic motivation is not closely related to social class. On the contrary, Herbert (2018) stated that poverty impacts student motivation, biological structures of the brain and child behaviours and that social stratification and student motivation have significant effects on student's ability to attain academically.

### Effect of social stratification on students' plane geometry achievement

Table 3 showed that the achievement mean score of students from low social stratum (Mean=40.21; SD=18.22) was slightly higher than the achievement mean score of students from high social stratum (Mean=39.73; SD=19.26). The difference in their achievement mean scores in plane geometry was (Mean=0.48; SD=1.00). Table 7 showed that there was significant difference between the achievement mean scores of students from low and high social strata in plane geometry ( $F_{(1, 383)} = 9.10, p < 0.05$ ), though the performance of the students from both strata were below average. Therefore, the null hypothesis two was rejected and the alternate hypothesis retained. The result of this study showed that there was significant effect of social stratification on students' plane geometry achievement in favour of students from low social stratum. Jean-Claud and Theresa (1998) had found out that low socioeconomic status (SES) participants performed worse than high SES participants in intellectual ability.

### Impact of social stratification on the male and the female students' motivation towards learning plane geometry

Table 4 showed that the motivation mean score of the male students from low social stratum (Mean=2.97; SD=1.09) was slightly higher than the motivation mean score of the female students from the same social stratum (Mean=2.87; SD=0.95). The difference in the motivation mean scores of the male and female students from low social stratum in learning plane geometry was (Mean=0.10; SD=0.14). Table 4 also showed that the motivation mean score of the male students from high social stratum (Mean=2.84; SD=1.01) was slightly higher than the motivation mean score of the female students from the same social stratum (Mean=2.82; SD=0.98). The difference in the motivation mean scores of the male and female students from high social stratum in learning plane geometry was (Mean=0.02; SD=0.03). Table 8 showed that there was no significant difference between the motivation mean scores of students from low and high social strata in learning plane geometry by gender ( $F_{(1, 380)} = 0.19, p > 0.05$ ) but the difference between the motivation mean scores of the male and the female students was significant ( $F_{(1, 380)} = 7.39, p < 0.05$ ). Therefore, the null hypothesis three was retained and the alternate hypothesis rejected. The study revealed that social stratification had no significant impact on the male and the female students' motivation towards learning plane geometry. Similar findings were obtained by Edeline (2014) and Acikgoz (2015).

### Effect of social stratification on the male and the female students' plane geometry achievement

Table 5 showed that the achievement mean score of the male students from low social stratum (Mean=60.08; SD=8.48) was slightly higher than the achievement mean score of the female students from the same social stratum (Mean=57.26; SD=6.19). The difference in the achievement mean scores of the male and female students from low social stratum in learning plane geometry was (Mean=2.82; SD=2.29). Table 5 also showed that the achievement mean score of the male students from high social

stratum (Mean=58.22; SD=5.54) was slightly higher than the achievement mean score of the female students from the same social stratum (Mean=57.23; SD=5.60). The difference in the achievement mean scores of the male and the female students from high social stratum in learning plane geometry was (Mean=0.99; SD=0.06). Table 9 showed that there was no significant difference between the achievement mean scores of students from low and high social strata in learning plane geometry by gender ( $F_{(1, 380)} = 0.97, p > 0.05$ ) and the difference between the achievement mean scores of the male and the female students was also not significant ( $F_{(1, 380)} = 0.04, p > 0.05$ ). Therefore, the null hypothesis four was retained and the alternate hypothesis rejected. The study found out that there was no significant effect of social stratification on the male and the female students' plane geometry achievement. This finding conformed to the result obtained by Edeline (2014) and Acikgoz (2015), who found out that there was no significant effect of social stratification on students' academic achievement by gender.

## IX. CONCLUSION

The study investigated the influence of social stratification on senior secondary students' motivation and achievement in plane geometry and found out that: social stratification had no significant influence on students' motivation towards learning plane geometry, there was significant effect of social stratification on students' plane geometry achievement in favour of students from low social stratum, social stratification had no significant impact on the male and the female students' motivation towards learning plane geometry, there was no significant effect of social stratification on students' plane geometry achievement by gender.

## X. RECOMMENDATIONS

The study recommended as follows:

1. Students should be intrinsically motivated and determined to learn plane geometry irrespective of their social stratification.
2. Students from high social stratification should be encouraged by their teachers and parents to improve their study habit and enhance their Mathematics performance like their counterparts from low social stratification.
3. The male and the female students should be motivation towards learning plane geometry by teachers despite their social stratification status.
4. Gender equity should be encouraged in Mathematics instruction since there was no significant effect of social stratification on students' plane geometry achievement by gender.

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