

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Preamble

This Part consists of the presentation, analysis and the interpretation of data gathered through structured questionnaire. In addition to this, background information of respondents is presented. Finally, the statistical methods of analysis were discussed, which included a descriptive analysis, independent sample t test and a linear regression analysis through SPSS version 20.

4.2 Analysis of Demographic Data

One hundred (100) questionnaires were administered physically to respondents and all the questionnaires were collected with a response rate of 100% i.e. all questionnaires were retrieved. Hence, responses were valid with complete answers. The demographic characteristics include: gender, age, school, and class of respondents. The demographic part of the analysis dealt with the personal data of the respondents based on the questionnaires given to them. The table below shows the details of background information of the respondents.

Table 4.1: Demographic Data of Respondents

| Measurement Items | Options | Frequency | Percent |
|-------------------|--------------|------------|------------|
| Gender | Female | 50 | 50 |
| | Male | 50 | 50 |
| | Total | 100 | 100 |
| Age | 12 years | 4 | 4 |
| | 13 years | 31 | 31 |
| | 14 years | 30 | 30 |
| | 15 years | 35 | 35 |
| | Total | 100 | 100 |

Source: Survey Result (2023)

In the above table: table 4.1 demographic data table shows that, out of 100 respondents, 50% (50) are females and the remaining 50% (50) were males. As far as age of respondents is concerned, 4%

of the respondents are of age 12, 13% of the respondents are of age 13, 30% of them are 14 years of age while those that are 15 years old are the majority representing 35% of the respondents.

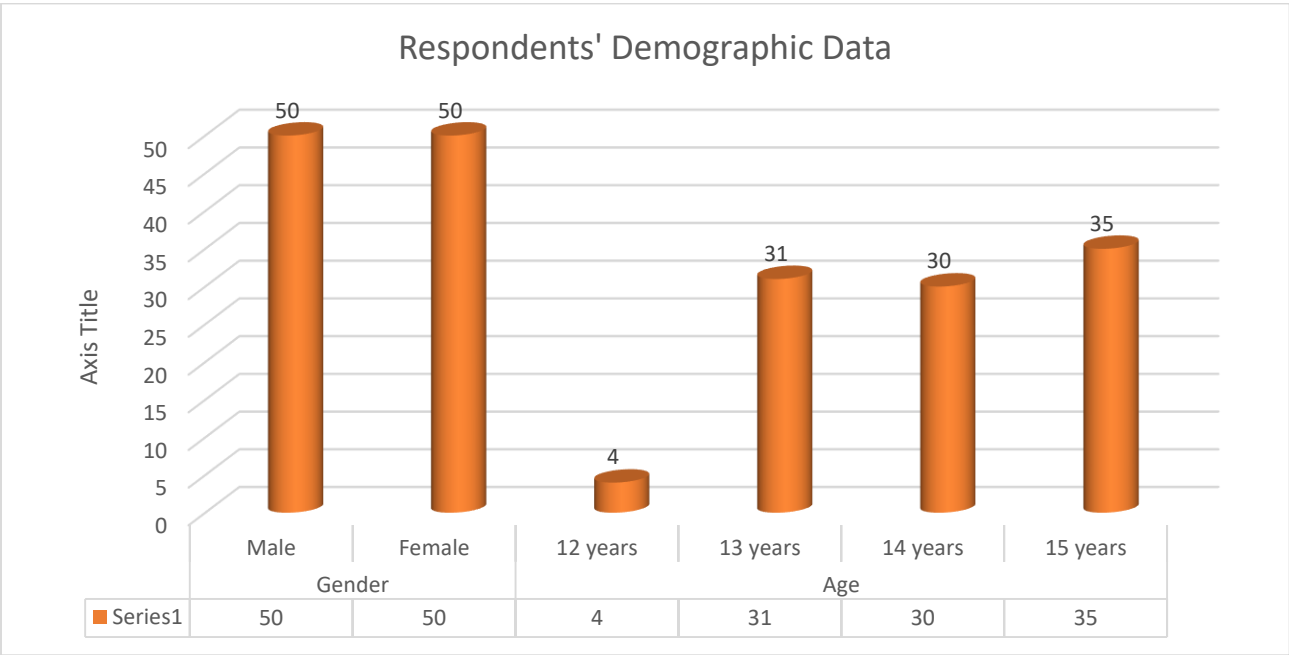


Figure 4.1: Demographic Data of Respondents

4.3. Analysis of Research Questions

4.3.1. Descriptive Analysis

The model this study used as the main guide for structured questionnaire was to collect data accurately on the students’ perceptions of the relationship between gender and students’ interest in chemistry. The researcher used the 5 – point likert scale of different dimension on 10 different questions. As it was thematically categorized on questionnaire considering the results for the individual question are discussed below individually.

4.3.2. Relationship between Gender and Students’ Interest in Chemistry.

The study sought to find out the relationship between gender and students’ interest in chemistry considering 5 different private schools.

Table 4.2: Relationship between Gender and Students’ Interest in Chemistry

| Measu rement | Items | Respondents Response (%) | | | | | | |
|-----------------|---|--------------------------|----|----|----|----|-----------------|-----------------------|
| No. | Gender and Students' Interest in Chemistry | 1 | 2 | 3 | 4 | 5 | Average Mean | Standard Deviation |
| Q1 | How interested are you in chemistry | 4 | 16 | 25 | 37 | 18 | 3.49 | 0.9262 |
| Q2 | How interested do you think student of the opposite gender are in chemistry | 11 | 25 | 35 | 10 | 19 | 3.01 | 0.9442 |
| Q3 | To what extent do you believe gender plays a role in shaping interest in chemistry | 24 | 16 | 16 | 24 | 20 | 3.00 | 0.7852 |
| Q4 | To what extent do you believe gender influences interest in chemistry | 21 | 20 | 22 | 18 | 19 | 2.94 | 0.8211 |
| Q5 | How confident do you feel when you do chemistry | 6 | 15 | 28 | 35 | 16 | 3.40 | 0.7812 |
| Q6 | To what extent do you believe your gender has influenced your confidence in studying chemistry | 30 | 14 | 18 | 15 | 23 | 2.87 | 0.6491 |
| Q7 | Have you ever encountered gender-based stereotypes or bias in your chemistry classes or educational material | 28 | 24 | 23 | 18 | 7 | 2.52 | 0.8204 |
| Q8 | Do you believe that there is a difference in how male or female students are encouraged or supported in chemistry education | 30 | 34 | 25 | - | 11 | 2.28 | 0.9263 |

| | | | | | | | | |
|------------|---|----|----|----|----|----|------|--------|
| Q9 | Do you think there are enough female role models in the field of chemistry | 16 | 27 | 17 | 26 | 14 | 2.95 | 0.9442 |
| Q10 | Do you plan to pursue a career or further education in a field related to chemistry | 4 | 11 | 18 | 32 | 35 | 3.83 | 0.7852 |

Source: Survey Result (2023)

Students of different schools were asked to give their view on whether being a male or female has something to do with having interest in chemistry. Table 4.2 presents the top mean ratings and standard deviations of the responses. The top items to measure relationship between gender and students in chemistry reported based on the mean values are: career in a field related to chemistry (3.83), level of interest in chemistry (3.49), confidence when doing chemistry (3.40), level of interest in chemistry relative to gender (3.01), extent of gender role in influencing interest in chemistry (3.00), female role models in the field of chemistry (2.95), influence of gender on interest in chemistry (2.94), personal experience on influence of gender chemistry study (2.87), gender-based stereotypes in chemistry classes (2.52), difference between how male and female students are encouraged in chemistry education (2.28).

The table shows that each of the statements or items has a mean response unit between 2.0 and 4.0, thus, considered to be desirable. More importantly, item 10 (Q10: *mean* = 3.834, *SD* = 0.7852) has the largest mean response unit. This suggests that the most desirable statement of measurement for ‘relationship between gender and interest in chemistry’ is that “most students plan to pursue a career or further education in a field related to chemistry”. Thus, majority of the responses cluster around “intermediate” response scales.

The next most important item is “interest in chemistry” (Q1: *mean* = 3.48, *SD* = 0.9262); showing how close the respondents’ responses on the item are to the mean. Majority of the students have interest in chemistry with 37% of them with strong interest and 18% with extreme interest. Conclusively we can say a good number of respondents have high level of interest in chemistry.

The next most important item is “confidence when doing chemistry” (Q5: $mean = 3.40$, $SD = 0.7812$). This shows how close the respondents’ responses on the item are to the mean. The way students feel confident while doing chemistry is a symbol of passion and dedication.

The three items with the least ratings on the priority order were “personal experience on influence of gender chemistry study (Q6: $mean = 2.87$, $SD = 0.6491$), gender-based stereotypes in chemistry classes (Q7: $mean = 2.52$, $SD = 0.8204$), and difference between how male and female students are encouraged in chemistry education (Q8: $mean = 2.28$, $SD = 0.9263$).

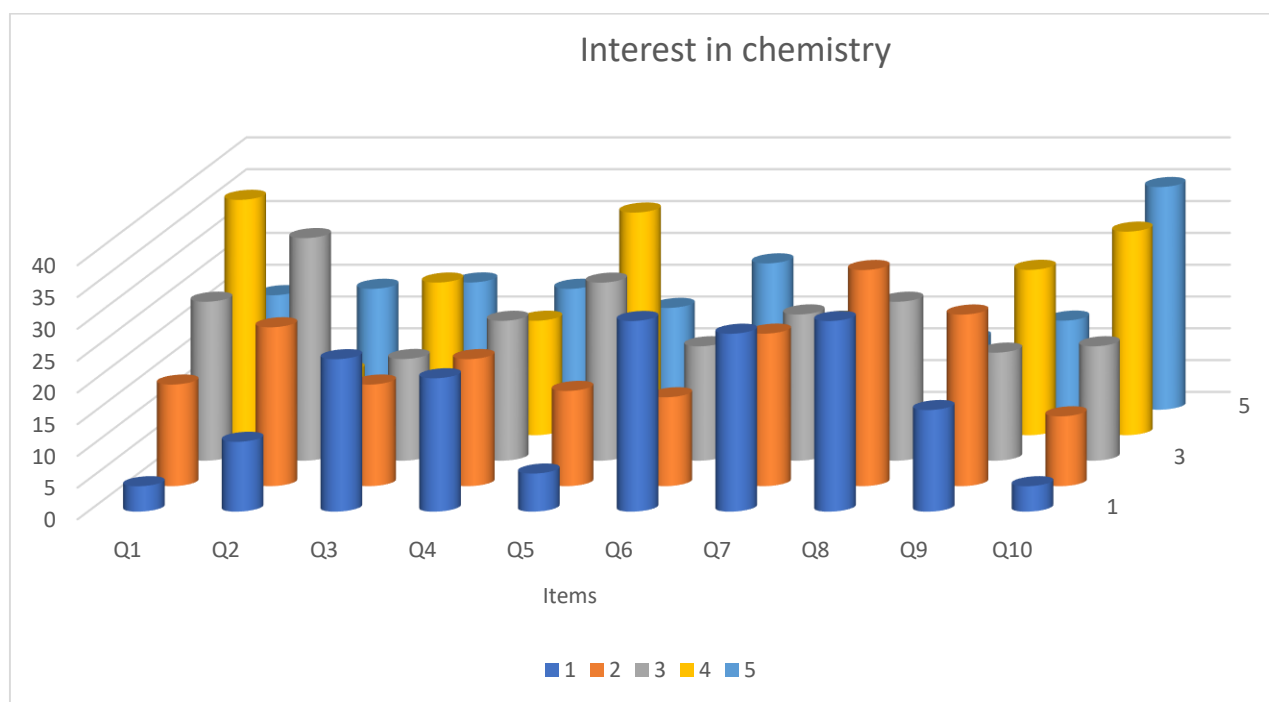


Figure 4.2: Gender and Student's interest in chemistry

4.5 Analysis of Research Hypothesis

Hypothesis: There is a significant relationship between gender and student's interest in chemistry among senior secondary school students.

Research hypothesis one was analysed using the responses of the SS1 students in different private schools on question 1-10 of the questionnaires.

Table 4.4: Model Summary

| Model | R | R Square | Adjusted R Square | Standard Error Estimate |
|-------|-------------------|----------|-------------------|-------------------------|
| 1 | .825 ^a | .680 | .677 | .42588 |

a. Predictors: (constant) Sex...

Table 4.5: Anova^a

| Model | | Sum of Squares | df | Mean Square | F | Significance |
|-------|------------|----------------|----|-------------|---------|-------------------|
| 1 | Regression | 37.822 | 1 | 37.822 | 208.534 | .000 ^b |
| | Residual | 17.775 | 98 | .181 | | |
| | Regression | 37.822 | | | | |

a. Dependent Variable: Q

b. Predictors: (constant) Sex...

Table 4.6: Group Statistics

| Sex | | N | Mean | Std. Deviation | Std. Error mean |
|-----|--------|----|--------|----------------|-----------------|
| Q | Male | 50 | 3.5880 | .28546 | .04037 |
| | Female | 50 | 2.3580 | .53034 | .07500 |

Table 4.7: Independent Test

| Sex | | F | Sig | t | df | Sig(2-tailed) | Mean dif. | 95% CI | |
|-----|---------------------|--------|------|--------|--------|---------------|-----------|---------|---------|
| | | | | | | | | Lower | Upper |
| Q | Equal variances | 29.204 | .000 | 14.441 | 98 | .000 | | 1.06097 | 1.39903 |
| | Not Equal variances | | | 14.441 | 75.194 | .000 | | 1.06097 | 1.39903 |

Tables 4.4, 4.5, 4.6 and 4.7 present the model summary, analysis of variance, group statistics and Independent test of the findings, respectively. The model summary table (Table 4.4) shows that gender actually influence the interest in chemistry ($R = 0.825$). This implies that a male student is

more likely to have interest or stronger interest in chemistry than a female student and this can be confirmed by the result shown in the table group statistics (Table 4.6) where the means of male (3.5880) is greater than means of female (2.3580).

The model further shows the extent to which gender accounts for variation in interest in chemistry. The coefficient of determination ($R^2 = 0.680$) shows that 68% of student's attitude towards is accounted for by gender. This implies that 68% is the extent at which gender contributes to the interest of students in chemistry.

Table 4.5 indicates the degree to which the regression model predicts the dependent variable, as indicated by the statistical significance of the regression model. The p -value of 0.000 shows that the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data).

Table for 4.7 shows the levene's test for equality of variances. The P -value is less than 0.05 which means equal variances is not assumed between the two groups i.e. male and female.

4.5 Discussion of findings

The findings of this study revealed that there was a statistically significant relationship ($r = 0.825$; $p < 0.05$) between gender and student's interest in chemistry. Various tests carried out confirm this statement including the independent sample t test which shows that there were significant differences ($t(75.195) = 14.441$, $p = 0.000$) in the scores with mean score for Male ($M = 3.5880$, $SD = 0.2855$) was higher than Female ($M = 2.358$, $SD = 0.5303$). The magnitude of the differences in the means (mean difference = 1.23, 95% CI: 1.0610 to 1.3990) was significant. Therefore, the null hypothesis was accepted. This implies that gender can be a factor that influence interest of students in chemistry. This finding is in agreement with Owojaiye & Zuya's (2016) submission in "Difference on student's perceptions of science education", where it was also established that, there is a significant relationship between gender and student's interest in chemistry as the study found out that male students display more positive attitude towards chemistry compared to their female counterpart.