Chapter 4

Data Analysis and Interpretation

CHAPTER - 4

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The previous chapters in the study deal with the conceptual and theoretical aspects of the study, detailed review of literature, and methodology in the following chapter. After that, the objectives and hypotheses of the research are collected, followed by scoring and tabulation of the data, the analysis and finally the interpretation is done. The present study focuses mainly on the analysis and interpretation of the data that were collected for the study.

4.2 Analysis of the Data

Data is a collected form of facts for extracting factual information from the set of raw data. Analysis of data in a structured and systematic procedure of categorizing, arranging, ordering, and summarizing the data to discover facts and for getting answers related to the research purpose. The basic purpose of data analysis is to reduce data into a simple and interpretable form so that inferences may be drawn from it (Kothari, 2004). Analysis and interpretation of data are helpful in knowing the relationship between the variables and drawing appropriate conclusions. Data analysis is the process of breaking the data into smaller parts to extract useful information for forecasting the outcomes. Careful analysis with the help of appropriate statistical techniques leads to better prediction and accurate assessment. Therefore, data analysis is an important step that involves a whole composite procedure for assessing data utilizing appropriate descriptive and inferential statistics.

4.3 Objective-wise Analysis, Interpretation and Discussion of Results

To facilitate and bring clarity, the entire analysis is presented and the results based on it are discussed under the following sections –

Section 1: Pearson's Product Moment Correlation

Pearson product moment correlation is used to study the relationship between the variables. In the present study, it is used to know the relationship between an independent variable (self-efficacy), dependent variable (academic achievement) and demographic variable (gender).

Section II: Independent Sample t-test

Independent sample t-test is a technique that is used to analyze the mean comparison. In the present study, it is used to study the significant difference between dependent variable (academic achievement) and independent variable (self-efficacy) along with demographic variable (gender) on which the following hypotheses are formulated.

Section 1: Pearson's Product Moment Correlation

To achieve the above-stated objective, the Pearson product moment correlation was applied and the values of correlation coefficient (r) were obtained. The calculated values of correlation between the dependent and independent variables for the secondary school students are represented in the tabular form.

4.3.1 The Relationship between Self-Efficacy and Academic Achievement of Secondary School Students

Objective 1

To study the relationship between self-efficacy and academic achievement of secondary school students.

Hypothesis 1

There is no significant relationship between self-efficacy and academic achievement of secondary school students.

To find out the relationship between the independent and dependent variable, Pearson product moment correlation was applied and the value of correlation (r) was obtained. The calculated value is represented in tabular form in table 4.1.

Table 4.1

Correlation between dependent and independent variable among the total sample of secondary school students

Independent variable	Dependent variable (Academic Achievement) (N=106)
Self-Efficacy	0.328**

***Correlation is significant at 0.01 level*

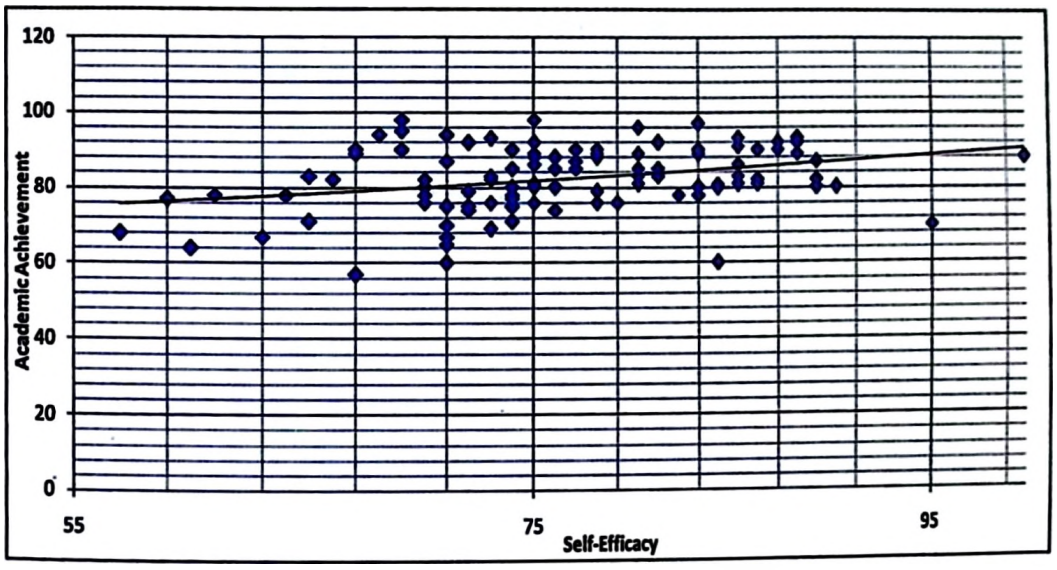

Figure 4.1: **The scatter plot of correlation between self-efficacy and academic achievement of the total sample of secondary school students**

The correlation coefficient between academic achievement and self-efficacy is found to be $r = 0.328$, $p < 0.01$ is significant at 0.01 level of significance for the total sample of secondary students. The graphical representation of correlation shows that the line drawn the data points is positive and mostly data are clustered along the line of best fit. It can be interpreted that changes in dependent and independent are associated with each other. This indicates that an increase in self-efficacy scores leads to an increase in their academic achievement or vice-versa. As per Cohen's (1988) convention of effect size, the coefficient of correlation ($r = 0.328$) indicates a moderate strength of correlation between self-efficacy and academic achievement. Thus it can be said that self-efficacy has a significant role in academic achievement of a total of secondary school students.

The findings are in harmony with Lane and Lane (2001) who observed that self-efficacy had utility in academic performance. Ergul (2004) revealed that the self-efficacy of distance education learners' was significantly correlated with their academic achievement.

However, a contradictory finding was reported by Mbatha (2015) that self-efficacy had no significant relationship with academic performance.

4.3.2 The Relationship between Self-Efficacy and Academic Achievement among Male Secondary School Students

Objective 2

To study the relationship between self-efficacy and academic achievement among male secondary school students.

Hypothesis 2

There is no significant relationship between self-efficacy and academic achievement of male secondary school students.

To find out the relationship between the independent and dependent variable, Pearson product moment correlation was applied and the value of correlation (r) was obtained. The calculated value is represented in tabular form in table 4.2.

Table 4.2

Correlation between dependent and independent variables among the male sample of secondary school students

Independent variable	Dependent variable (Male Academic Achievement) (N= 57)
Self-Efficacy	0.219

NS- Not significant

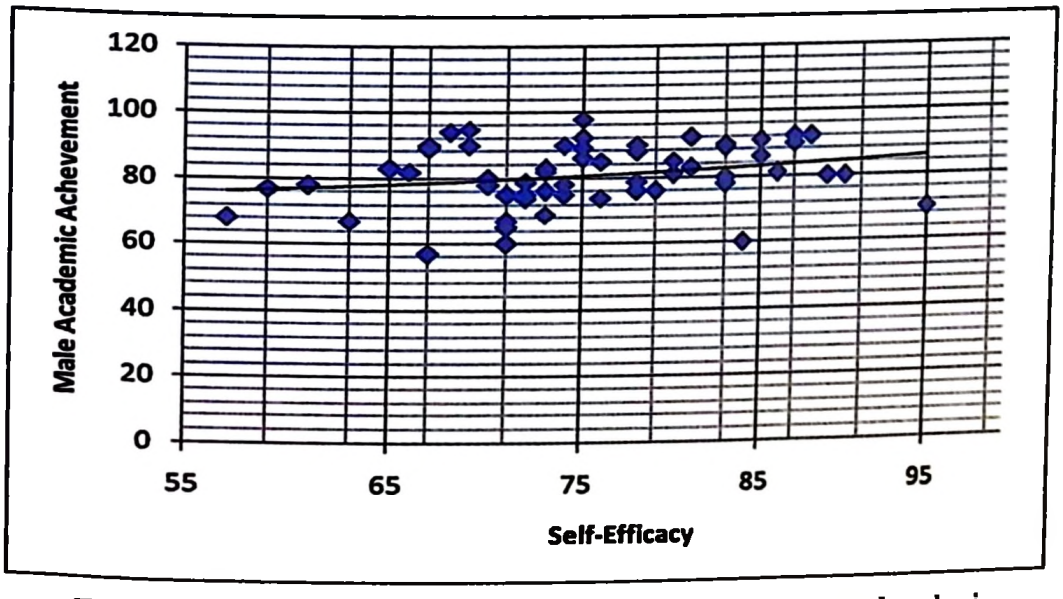

Figure 4.2: **The scatter plot of correlation between self-efficacy and academic achievement of the male sample of secondary school students**

The correlation coefficient between academic achievement and self-efficacy is found to be $r = 0.219$, $p > 0.05$ is not significant for the male sample of secondary students. Thus null hypothesis is not rejected and that is there is no significant

relationship between self-efficacy and academic achievement among male students. The graphical representation of correlation shows that the line drawn by the data points is positive and mostly data are clustered along the line of best fit. Hence it can be interpreted that an increase in self-efficacy will lead to an increase in scores of academic achievement.

4.3.3 The Relationship between Self-Efficacy and Academic Achievement among Female Secondary School Students

Objective 3

To study the relationship between self-efficacy and academic achievement among female secondary school students.

Hypothesis 3

There is no significant relationship between self-efficacy and academic achievement of female secondary school students.

To find out the relationship between the independent and dependent variable, Pearson product moment correlation was applied and the value of correlation (r) was obtained. The calculated value is represented in tabular form in table 4.3.

Table 4.3

Correlation between dependent and independent variable among the female sample of secondary school students

Independent variable	Dependent variable (Female AcademicAchievement) (N = 49)
Self-Efficacy	0.444**

***Correlation is significant at 0.01 level*

Figure 4.3: **The scatter plot of correlation between self-efficacy and academic achievement of the female sample of secondary school students**

The correlation coefficient between self-efficacy and academic achievement is found to be 0.444, $p < 0.01$ is significant at 0.01 level of significance for female secondary students. The figure represents the positive correlation, data points are scattered around the line of best fit. The figure represents the positive correlation, data points are scattered around the line of best fit. According to Cohen's (1988) guidelines of the effect size, the value of r has moderate strength of correlation. It can be interpreted that an increase in self-efficacy scores leads to a corresponding increase in academic achievement of female secondary school students.

Further, the present finding also draws support from the (Ifdil, Apriani, Yendi & Rangka, 2006; Mafla et al., 2019) that self-efficacy and academic achievement of female senior secondary school students were significantly positively related to each other.

Section II: Independent Sample t-test

To achieve the above-stated objective, Independent sample t-test was applied and the value of mean scores was analyzed and the results were obtained.

4.3.4 The Differences in Mean Scores of Self-Efficacy of Male and Female Secondary School Students

Objective 4

To study the differences in mean scores of self-efficacy of males and females secondary school students

Hypothesis 4

There is no significant difference in mean scores of self-efficacy of male and female secondary students.

To find the mean score, independent sample t-test was applied and required values were obtained. The calculated values are represented in tabular form in table 4.4

Table 4.4

Gender-wise M, SD, N and t-value of Self-efficacy of secondary school students

Gender	N	Mean	SD	t-value	Sig (2-tailed)	Remark
Male	57	75.53	8.096	-1.563	0.121	p > 0.05 (Not Significant)
Female	49	77.96	7.863			

From table 4.4, it can be seen that value is not significant at 0.05 level. Thus the hypothesis, that there is no significant difference between mean scores of self-efficacy of male and female secondary students is not rejected.

The plausible reason is that as self-efficacy means the individual's belief that they can execute behaviors necessary to produce specific performance, both males and females are much aware of what to execute and at what stage. When self-efficacy is perceived it will facilitate goal setting, overcoming obstacles persistence and recovery from disappointments and failures. In the present generation, teachers, staff and their peers help learners by motivating them to build self-concept, control and cognitive processes. It will help in developing a deeper interest in activities students get involved in, quickly recovering from any setbacks and disappointments.

Tenaw and Markos (2013) reported in the study that both males and females have no significant difference in self-efficacy. Pasricha (2015) also reported that males and females have no significant difference in self-efficacy.

4.3.5 The Differences in Academic Achievement of Male And Female Secondary School Students

Objective 5

To compare the academic achievement scores among secondary students taking gender as a factor. For that independent sample t-test is used as the results are obtained.

Hypothesis 5

There is no significant relationship between mean scores of academic achievement of male and female secondary students.

To find the mean score, independent sample t-test was applied and required values were obtained. The calculated values are represented in tabular form in table 4.5

Table 4.5

Gender-wise M, SD, N and t-value of Acdemic achievement of secondary school students

Gender	N	Mean	SD	t-value	Sig. (2-tailed)	Remark
Male	57	80.86	9.397	-1.704	0.091	p > 0.05 (Not Significant)
Female	49	83.77	7.934			

From the table 4.5, it can be seen that value is not significant at 0.05 level. Thus the hypothesis, that there is no significant difference between mean scores of academic achievement of male and female secondary students is not rejected. Students and their parents have taken education as an important dimension. The government has launched various schemes related to education and other resources so that each individual living in different regions gets access to those and can be benefited from them. Be the learner be of any race, gender, caste or tribe, education is provided with best resources and facilities required for the learners. Parents and peer members have actively participated in education as they have felt the need for education seeing the current situation and making them skill-ready to take wise and better decisions in life.

Yadav (2018) reported in the study that there is no difference in scores between the pure mathematics achievement scores of male and female students.