CHAPTER IV

ANALYSIS OF DATA AND INTERPRETATIONS

In the previous chapter, the researcher has presented the plan and procedure of the study. The present chapter deals with the analysis of the data and its interpretation.

In this study a survey was conducted to find out the level of scientific attitude among 8th and 9th standard students. A comparison between the scientific attitude of boys and girls, 8th and 9th standard students was made. Then a scientific attitude development programme was developed and its effectiveness was tested.

The following formula was used for the analysis of this data.

1) **Discrimination power** = \( \frac{\text{difference between upper 27\% and lower 27\% students}}{\text{Total percentage of students}} \)

2) **Difficulty level** = \( \frac{R}{N} \times 100 \)

3) **Mean (Average)**

\[ X = \frac{1}{N} \sum_{i=1}^{N} x_i \]

i.e. average of effectiveness of the group (average of the marks of respondents)

Where \( \sum x_i \) i.e. total effectiveness of the group (total of the marks of the respondents).

4) **Population variance**

\[ \sigma^2 = \frac{1}{N} \sum_{i=1}^{N} x_i^2 \]

Where \( X = (X - x) \)

\( \sum x^2 \) is the total of square of different between observation and population mean.

5) **Population Standard Deviation**

\[ \sigma = \sqrt{\frac{1}{N} \sum_{i=1}^{N} X^2} \]

Where, \( X^2 \) is the total square of difference between observation and Population mean.
6) **Sample variance**

\[ S^2 = \frac{1}{N-1} \sum X^2 \]

Where, \( X (X-x) \)

\( \sum x^2 \) is the total square of different between observation and sample mean.

7) **Sample Standard Deviation**

\[ S^2 = \sqrt{\frac{1 - \sum X^2}{N - 1}} \]

Where, \( \sum x^2 \) is the total square of different between observation and sample mean.

8) **Coefficient of correlation**

\[ r = \frac{\sum X^2}{\sqrt{(\sum X^2)(\sum Y^2)}} \]

9) **Reliability**

\[ r = \frac{2n}{1+r} \]

10) **Statistical significance of difference between means**

\[ t = \frac{X^- - Y^-}{S \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}} \]

Where, \( N_1 \) and \( N_2 \) are the series of the variable \( x \) and \( y \) and \( S_1 \) and \( S_2 \) are their respective variance.

Objectivewise analysis of the data has been given as follows.
Objective No. 1

To measure the scientific attitude of 8th and 9th standard students.

Table No.6

Mean score of the 8th and 9th Standard Students on Scientific Attitude Scale (SAS)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Std.</th>
<th>No. of Students</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8th std. students</td>
<td>322</td>
<td>2.718</td>
</tr>
<tr>
<td>2</td>
<td>9th std. students</td>
<td>322</td>
<td>2.901</td>
</tr>
<tr>
<td>3</td>
<td>8th and 9th std. students</td>
<td>644</td>
<td>2.81</td>
</tr>
</tbody>
</table>

Observation

Above table shows that
1) The mean score of the 8th standard students on SAS is 2.718
2) The mean score of the 9th standard students on SAS is 2.901
3) The mean score of the 8th and 9th standard students on SAS is 2.81

Interpretation

1) 8th std. students are having average level (2.718) of scientific attitude.
2) 9th std. students are having average level (2.901) of scientific attitude.
3) Total 8th and 9th standard students average level (2.81) of scientific attitude.

Finding:

The 8th and 9th standard students are having average level of scientific attitude.

Objective No. 2

To compare the level of scientific attitude of boys and girls

Null Hypothesis

There is no significant difference in the level of scientific attitude of boys and girls
Table No.7
Analysis of Scores of Boys and Girls on SAS.

<table>
<thead>
<tr>
<th>Sex</th>
<th>No. of students</th>
<th>Mean</th>
<th>S.D.</th>
<th>Cal.–t</th>
<th>Diff.</th>
<th>t–table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>322</td>
<td>2.894</td>
<td>0.1774</td>
<td>2.384</td>
<td>692</td>
<td>2.33</td>
<td>Reject Null</td>
</tr>
<tr>
<td>Girls</td>
<td>322</td>
<td>2.776</td>
<td>0.1499</td>
<td></td>
<td></td>
<td></td>
<td>Hypothesis</td>
</tr>
</tbody>
</table>

**Graph No.1**: Graph of Mean score of Boys and Girls on Scientific Attitude Scale

**Observation**

From the above table and graph it is clear that

1) Mean SAS score of boys is 2.853 and the mean SAS score of girls is 2.776.

2) Standard deviation of boys is 0.1774 and standard deviation of girls is 0.1499.

3) Calculated value ‘t’ is 2.384.

4) Degrees of freedom are 2.384.

5) Table value of t is 2.33

6) Null hypothesis was rejected and the research hypothesis was accepted.
**Interpretation**

1. As calculated-t value is greater than table value, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.

**Finding**

There is significant difference between the level of scientific attitude of boys and that of girls. The level of scientific attitude of boys is significantly higher than that of girls.

**Objective No. 3**

To compare the level of scientific attitude of 8th standard and 9th standard students.

**Null Hypothesis**

There is no significant difference in the level of scientific attitude of 8th standard and that of 9th standard students.
### Table No. 8

**Analysis of Scores of 8th Standard and 9th Standard students in SAS.**

<table>
<thead>
<tr>
<th>Std.</th>
<th>No. of students</th>
<th>Mean</th>
<th>S.D.</th>
<th>Cal.- t</th>
<th>Diff.</th>
<th>t–table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th</td>
<td>322</td>
<td>2.718</td>
<td>0.1375</td>
<td>6.1984</td>
<td>642</td>
<td>2.3321</td>
<td>Reject Null</td>
</tr>
<tr>
<td>9th</td>
<td>322</td>
<td>2.911</td>
<td>0.1746</td>
<td></td>
<td></td>
<td></td>
<td>Hypothesis</td>
</tr>
</tbody>
</table>

#### Graph No.2 : Graph of Mean score on SAS Vs Standard (Grade)

**Observation**

From the above table and graph it is clear that

1. Mean SAS score of the 8th standard student is 2.718 and the mean score of the 9th standard students is 2.911
2. Standard deviation of the 8th standard students is 0.13755 and standard deviation of 9th standard student is 0.1746
3. Calculated value of ‘t’ is 6.19845
4. Degrees of freedom is 642
5. Table value of ‘t’ is 2.3321
6. Null hypothesis was rejected and the research hypothesis was accepted.
**Interpretation**

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at the 0.01 level of significance.

**Finding**

There is significant difference between the level of scientific attitude of 8th standard students and 9th standard students. The level of scientific attitude of 9th standard students is significantly higher than that of 8th standard students.

**Objective No. 4**

To find out the levels of different components of scientific attitude among the students
Table No. 9

Analysis of Mean Scores of the Students in Nine Components of SAS

<table>
<thead>
<tr>
<th>Components / Mean</th>
<th>Critical Thinking</th>
<th>Open Mindedness</th>
<th>Change the decision</th>
<th>Not to believe in superstitions</th>
<th>Suspened Judgment</th>
<th>Intellectual Honesty</th>
<th>Problem Solving</th>
<th>Curiosity</th>
<th>Respects Science Expts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.00</td>
<td>3.23</td>
<td>2.12</td>
<td>2.611</td>
<td>2.410</td>
<td>2.693</td>
<td>2.954</td>
<td>2.521</td>
<td>3.55</td>
</tr>
</tbody>
</table>

Graph No. 3: Graph of Mean Score in the Components of Scientific Attitude.

Observation

From the above table and graph it is clear that
1. Mean score of ‘critical thinking ability’ is 3.00
2. Mean score of ‘open mindedness’ is 3.23
3. Mean score of ‘to be ready to change the decision’ is 2.12
4. Mean score of ‘curiosity’ is 2.521
5. Mean score of ‘not to believe in superstitions’ is 2.611
6. Mean score of ‘suspended judgment’ is 2.410
7. Mean score of ‘intellectual honesty’ is 2.693
8. Mean score of ‘seeking to adopt different planned procedures in solving the problem’ is 2.954
9. Mean score of ‘to have respect for scientific experiments’ is 3.55
**Interpretation**

The range of the scores of the students in six components viz to be ready to change the decision, curiosity, not to believe in superstitions, suspended judgment, intellectual honesty and seeking to adopt different planned procedure in solving the problem is from 2.00 to 2.99, and the range of the score of the students in three components viz Critical thinking ability, Open mindedness, and respect for scientific experiments is 3.00 to 3.99.

(This interpretation is done based on the chart provided by Dr. G. S. Patil which is given in appendices)

**Finding**

The students are at average level in the six components viz to be ready to change the decision, curiosity, not to believe in superstitions, suspended judgment, intellectually honesty and seeking to adopt different planned procedures in solving the problem. They are at a high level in the three components viz critical thinking ability, open mindedness and respect for scientific experiments.

**Objective No. 5**

To prepare a Scientific Attitude Development Programme for 8th and 9th standard students.

This objective was procedural one. The procedure of development of the programme is given in chapter III.

**Part II**

**Objective No. 6**

To study the effectiveness of the scientific attitude development programme.

To achieve the objective No. 6, researcher prepared the Situational Test on Scientific Attitude. The Scientific Attitude scale prepared by Dr.G.S.Patil was also used.

**Null Hypothesis**

There is no significant difference in the level of scientific attitude of control group and experimental group after the implementation of the programme.
Table No. 10

Analysis of Post-test Scores in SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of students</th>
<th>Mean</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>Diff.</th>
<th>t-table 0.01</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.3376</td>
<td>0.10500</td>
<td>8.3127</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2</td>
<td>Control Group</td>
<td>40</td>
<td>2.66189</td>
<td>0.15934</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.4 : Graph of Mean post test scores in SAS Vs Groups.

Observation

From the above table and graph it is clear that

1. Mean SAS score of experimental group is 3.3376 and mean SAS score of control group is 2.66189.
2. Standard deviation of experimental group is 0.10500 and standard deviation for control group is 0.15934.
3. Calculated value of ‘t’ is 8.3127
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation

As t calculated value is greater than table value, the researcher rejected null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 11
Analysis of Post-test Scores in Situational Test on Scientific Attitude (STSA)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>35.75</td>
<td>14.55128</td>
<td>6.7077</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>27.95</td>
<td>39.535</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.5 : Graph of Mean Post-tests Scores on STSA Vs Group

Observation
From the above table and graph it is clear that
1. Mean STSA score of experimental group is 35.75 and means STSA score of control group is 27.95
2. Standard deviation of experiment group is 14.55128 and standard deviation of control group is 39.535.
3. Calculated value of ‘t’ is 6.7077
4. Degree of freedom is 78.
5. Table value of t is 2.3751.
6. Null hypothesis was rejected and the research hypothesis was accepted.
Interpretation

As t-calculated value is greater than table value; the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.

Finding

The programme for developing scientific attitude is helpful for enhancing the level scientific attitude of the school students.

Null Hypothesis

There is no significant difference in the control and experimental group with reference to the mean level of critical thinking ability.
Table No. 12

Analysis of Post-test Scores in ‘Critical Thinking Ability’ Component of SAS.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean ( M )</th>
<th>S.D.</th>
<th>Cal. ( t )</th>
<th>d.f.</th>
<th>( t )-table ( 0.01 )</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>2.3547</td>
<td>0.1354</td>
<td>6.6229</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>1.62812</td>
<td>0.3461</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No. 6: Graph of mean post-test scores in C.T.A.C. of SAS Vs Groups.

C.T.A.C. - Critical Thinking Ability Component

Observation
From the above table and graph it is clear that
1. For critical thinking ability component of SAS mean score of experimental group is 2.3547 and mean score of control group is 1.62812
2. Standard deviation of experimental group is 0.1354 and standard deviation of control group is 0.3461
3. Calculated value of ‘\( t \)’ is 6.6229
4. Degree of freedom is 78.
5. Table value of ‘\( t \)’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation
As \( t \)-calculated value is greater than table value, the researcher rejects the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 13

Analysis of Post-test Scores in ‘Critical Thinking Ability’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.85</td>
<td>0.3358</td>
<td>4.5227</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>3</td>
<td>1.0769</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observation

From the above table and graph it is clear that

1. For critical thinking ability component of STSA mean score of experimental group is 3.85 and mean score of control group is 3.
2. Standard deviation of experimental group is 0.3358 and standard deviation of control group is 1.0769.
3. Calculated value of ‘t’ for is 4.5227.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751.
6. Null hypothesis was rejected and the research hypothesis was accepted.
Interpretation

As t-calculated value is greater than table value, the researcher rejected the null hypothesis and accepted the research hypothesis at the 0.01 level of significance.

Finding

The programme for developing scientific attitude is helpful for enhancing the level of critical thinking ability of the school students.

Null Hypothesis

There is no significant difference in the control and experimental group with reference to the mean level of open mindedness
Table No. 14

Analysis of Post-test Scores in ‘Open Mindedness’ Component of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>2.6876</td>
<td>0.1022</td>
<td>2.6130</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>2.4067</td>
<td>0.3599</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.8 : Graph of Mean Post-test Scores in O.M.C. of SAS Vs Groups
O.M.C. – Open Mindedness Components

Observation

From the above table and graph it is clear that
1. For open mindedness component of SAS mean score of experimental group is 2.6876 and mean score of control group is 2.4067
2. Standard deviation of experimental group is 0.1022 and standard deviation of control group is 0.3599
3. Calculated value of ‘t’ is 2.6130
4. Degrees of freedom are 78.
5. Table value of ‘t’ is 2.3751.
6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation

As t-calculated is greater than table value. Therefore, the researcher rejects the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 15

Analysis of Post-test Scores in ‘Open Mindedness’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>4.375</td>
<td>0.5480</td>
<td>3.799</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>3.575</td>
<td>1.225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No. 9: Graph of Mean Post-test Scores in O.M.C. of STSA Vs Groups
O.M.S. – Open Mindedness Component

Observation

From the above table and graph it is clear that

1. For open mindedness component of STSA, the mean score of experimental group is 4.375 and means score of control group is 3.575.
2. Standard deviation of experimental group is 0.5480 and standard deviation of control group is 1.225
3. Calculated value of ‘t’ is 3.799
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751.
6. Null hypothesis was rejected and the research hypothesis was accepted.
**Interpretation**

As $t$-calculated is greater than table value. Therefore, the researcher rejects the null hypothesis and accepted the research hypothesis at the 0.01 level of significance.

**Finding**

The programme for developing the scientific attitude is helpful for enhancing the level of open mindedness of the school students.

**Null Hypothesis**

There is no significant difference in the control and experimental group with reference to the mean level of readiness to change the decision.
Table No. 16
Analysis of Post-test Scores in ‘Readiness to Change the Decision’
Components of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>1.8312</td>
<td>0.0439</td>
<td>2.8039</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>1.5920</td>
<td>0.2470</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No. 10: Graph of Mean Post-test Scores in R.C.D.C. of SAS Vs Groups
R.C.D.C. - Readiness to Change the decision

Observation
From the above table and graph it is clear that
1. For readiness to change the decision component of SAS, the mean score of experimental group is 1.8312 and the mean score of control group is 1.5920
2. Standard deviation of experimental group is 0.0439 and standard deviation of control group is 0.2470
3. Calculated value of ‘t’ is 2.8039.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation
As t-calculated is greater than table value. Therefore, the researcher rejects the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 17

Analysis of Post-test Scores in ‘Readiness to Change the Decision’ Components of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.65</td>
<td>0.489</td>
<td>4.6911</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2</td>
<td>Control Group</td>
<td>40</td>
<td>2.625</td>
<td>1.419</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.11 : Graph of Mean Post-test Scores in R.C.D.C. of STSA Vs Groups
R.C.D.C. - Readiness to Change the Decision Component.

Observation

From the above table and graph it is clear that

1. For readiness to change the decision component of STSA the mean score of experimental group is 3.65 and the mean score of control group is 2.625.

2. Standard deviation of experimental group is 0.489 and standard deviation of control group is 1.419.

3. Calculated value of ‘t’ is 4.6911.

4. Degree of freedom is 78.

5. Table value of ‘t’ is 2.3751

6. Null hypothesis was rejected and the research hypothesis was accepted.
Interpretation

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.

Finding

The programme for developing scientific attitude is helpful for enhancing the level of students readiness to change the decision.

Null Hypothesis

There is no significant difference in the control and experimental group with reference to the mean level of curiosity.
Table No. 18
Analysis of Post-test Scores in ‘Curiosity’ Component of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>1.9218</td>
<td>0.3211</td>
<td>4.5055</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>1.2125</td>
<td>0.6704</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.12: Graph of Mean Post-test Scores in C.C. of SAS Vs Groups
C.C. – Curiosity Component.

Observation
From the above table and graph it is clear that
1. For curiosity component of SAS, the mean score of experimental group is 1.9218 and the mean score of control group is 1.2125.
2. Standard deviation of experimental group is 0.3211 and standard deviation of control group is 0.6704.
3. Calculated value of ‘t’ is 4.5055.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation
As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 19

Analysis of Post-test Scores in ‘Curiosity’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group.</td>
<td>40</td>
<td>4.1</td>
<td>0.8615</td>
<td>1.5827</td>
<td>78</td>
<td>2.3751</td>
<td>Accept Null hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group.</td>
<td>40</td>
<td>3.725</td>
<td>1.3839</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.13 : Graph of Mean Post-test Scores in C.C. of STSA Vs Groups
C.C. – Curiosity Component.

Observation

From the above table and graph it is clear that

1. For curiosity component of STSA, the mean score of experimental group is 4.1 and the mean score of control group is 3.725.
2. Standard deviation of experimental group is 0.8615 and standard deviation of control group is 1.3839.
3. Calculated value of ‘t’ is 1.5827.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was accepted and the research hypothesis was rejected.
**Interpretation**

As t-calculated value is less than table value. Therefore, researcher accepted the null hypothesis and rejected the research hypothesis at 0.01 level of significance.

**Finding**

The programme for developing scientific attitude is helpful for enhancing the level of curiosity of the school students.

**Null Hypothesis**

There is no significant difference in the control and experimental group with reference to the mean level of superstitions.
Table No. 20

Analysis of Post-test Scores in ‘Not to Believe in Superstitions’ Component of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>2.5778</td>
<td>0.2125</td>
<td>5.5925</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>1.763</td>
<td>0.6366</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.14 : Graph of Mean Post-test Scores in N.B.S.C. of SAS Vs Groups
N.B.S.C. – ‘Not to Believe in Superstitions’ Component

Observation
From the above table and graph it is clear that

1. For ‘not to Believe in Superstitions’ component of SAS, the mean score of experimental group is 2.5778 and the mean score of control group is 1.763.

2. Standard deviation of the experimental group is 0.2125 and standard deviation of control group is 0.6366.

3. Calculated value of ‘t’ is 5.5925.

4. Degree of freedom is 78.

5. Table value of ‘t’ is 2.3751

6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation
As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 21
Analysis of Post-test Scores in ‘Not to Believe in Superstitions’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>4.15</td>
<td>0.5410</td>
<td>4.9826</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>3</td>
<td>1.589</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graph No.15** : Graph of Mean Post-test Scores in N.B.S.C. of STSA Vs Groups
N.B.S.C. –‘Not to Believe in Superstitions’ Component

**Observation**
From the above table and graph it is clear that

1. For ‘Not to Believe in Superstitions’ component of STSA, the mean score of experimental group is 4.15 and the mean score of control group is 3.
2. Standard deviation of the experimental group is 0.5410 and standard deviation of control group is 1.589.
3. Calculated value of ‘t’ is 4.9826.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.
**Interpretation**

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis.

**Finding**

The programme for developing scientific attitude is helpful for enhancing the level of “not to believe in superstitions” component of scientific attitude among the school students.

**Null Hypothesis**

There is no significant difference in the control and experimental group with reference to the mean level of the suspended judgment ability.
**Table No. 22**  
Analysis of Post-test Scores in ‘Suspended Judgment Ability’ Component of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>2.2367</td>
<td>0.1424</td>
<td>5.1465</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>1.5352</td>
<td>0.6005</td>
<td>1.3333</td>
<td>78</td>
<td>2.3751</td>
<td></td>
</tr>
</tbody>
</table>

**Graph No.16 :** Graph of Mean Post-test Scores in S.J.C. of SAS Vs Groups  
S.J.A.C. – Suspended Judgment Ability Component

**Observation**  
From the above table and graph it is clear that

1. For suspended judgment ability component of SAS the mean score of experimental group is 2.2367 and the mean score of control group is 1.5352.
2. Standard deviation of the experimental group is 0.1424 and standard deviation of control group is 0.6005.
3. Calculated value of ‘t’ is 5.1465.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.

**Interpretation**  
As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 23

Analysis of Post-test Scores in ‘Suspended Judgment Ability’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.9</td>
<td>0.6564</td>
<td>4.0352</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>3</td>
<td>1.333</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observation

From the above table and graph it is clear that

1. For suspended judgment ability component of STSA, the mean score of experimental group is 3.9 and the mean score of control group is 3.
2. Standard deviation of the experimental group is 0.6564 and standard deviation of control group is 1.333.
3. Calculated value of ‘t’ is 4.0352.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.
Interpretation
As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis.

Finding
The programme for developing scientific attitude is helpful for enhancing the level of suspended judgment ability of the school students.

Null Hypothesis
There is no significant difference in the control and experimental group with reference to the mean level of intellectual honesty.
### Table No. 24

**Analysis of Post-test Scores in ‘Intellectual Honesty’ Component of SAS**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>1.8304</td>
<td>0.2553</td>
<td>4.0126</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>1.2233</td>
<td>0.6602</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graph No.18**: Graph of Mean Post-test Scores in I.H.C. of SAS Vs Groups

I.H.C. – Intellectual Honesty Components

**Observation**

From the above table and graph it is clear that

1. For intellectual honesty component of SAS, the mean score of experimental group is 1.8304 and the mean score of control group is 1.2233.
2. Standard deviation of the experimental group is 0.2553 and standard deviation of control group is 0.6602.
3. Calculated value of ‘t’ is 4.0126.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.

**Interpretation**

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 25
Analysis of Post-test Scores in ‘Intellectual Honesty’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.975</td>
<td>0.4865</td>
<td>3.6822</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>3.25</td>
<td>1.064</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.19 : Graph of Mean Post-test Scores in I.H.C. of STSA Vs Groups
I.H.C. – Intellectual Honesty Components

Observation
From the above table and graph it is clear that

1. For intellectual honesty component of STSA, the mean score of experimental group is 3.975 and the mean score of control group is 3.25.
2. Standard deviation of the experimental group is 0.4865 and standard deviation of control group is 1.064.
3. Calculated value of ‘t’ is 3.6822.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.
Interpretation

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.

Finding

The programme for developing scientific attitude is helpful for enhancing the level of Intellectual honesty of the school students.

Null Hypothesis

There is no significant difference in the control and experimental group with reference to the mean level of ability to seek to adopt different planned procedures in solving the problem.
Table No. 26
Analysis of Post-test Scores in ‘Seeking to Adopt Different Planned Procedures in Solving the Problem’ Component of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>2.3749</td>
<td>0.0557</td>
<td>1.7111</td>
<td>78</td>
<td>1.6646</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>2.2736</td>
<td>0.0844</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.20 : Graph of Mean Post-test Scores in S.A.P. P.S.P. SAS Vs Groups
S.A.P. P.S.P. - Seeking to Adopt Different Planned Procedure in Solving the Problems

Observation
From the above table and graph it is clear that
1. For seeking to adopt different planned procedures in solving the problem component of SAS, the mean score of experimental group is 2.3749 and the mean score of control group is 2.2736.
2. Standard deviation of the experimental group is 0.0557 and standard deviation of control group is 0.0844.
3. Calculated value of ‘t’ is 1.7111.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 1.6646
6. Null hypothesis was rejected and the research hypothesis was accepted.

Interpretation
As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.
Table No. 27
Analysis of Post-test Scores in ‘Seeking to Adopt Different Planned Procedures in Solving the Problem’ Component of STSA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.925</td>
<td>0.4814</td>
<td>3.6105</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>3.15</td>
<td>1.3615</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph No.21: Graph of Mean Post-test Scores in S.A.P. P.S.P. of STSA Vs Groups
S.A.P. P.S.P. - Seeking to Adopt Different Planned Procedure in Solving the Problems

Observation
From the above table and graph it is clear that

1. For seek to adopt different planned procedures in solving the problem component of STSA, the mean value of experimental group is 3.925 and the mean value of control group is 3.15.
2. Standard deviation of the experimental group is 0.4814 and standard deviation of control group is 1.3615.
3. Calculated value of ‘t’ is 3.6105.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.
Interpretation

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.

Finding

The programme for developing scientific attitude is helpful for enhancing the students’ ability to seek to adopt different planned procedure in solving the problem.

Null Hypotheses

There is no significant difference in the control and experimental group with reference to the mean level of respect to scientific experiments.
Table No. 28
Analysis of Post-test Scores in ‘Respect for Scientific Experiments’ Component of SAS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>2.5275</td>
<td>0.1282</td>
<td>3.5968</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>2.0866</td>
<td>0.4726</td>
<td></td>
<td></td>
<td></td>
<td>Hypothesis</td>
</tr>
</tbody>
</table>

Graph No.22 : Graph of Mean Post-test Scores in R.S.E.C. of SAS Vs Groups
R.S.E.C. – Respect for Scientific Experiment Component

Observation
From the above table and graph it is clear that
1. For respect to scientific experiments component of SAS, the mean score of experimental group is 2.5275 and the mean score of control group is 2.0866.
2. Standard deviation of the experimental group is 0.1282 and standard deviation of control group is 0.4726.
3. Calculated value of ‘t’ is 3.5968.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted

Interpretation
As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted research hypothesis at 0.01 level of significance.
**Table No. 29**

**Analysis of Post-test Scores in ‘Respect to Scientific Experiments’ Component of STSA**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>No. of Students</th>
<th>Mean (M)</th>
<th>S.D.</th>
<th>Cal. t</th>
<th>d.f.</th>
<th>t.table</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expt. Group</td>
<td>40</td>
<td>3.95</td>
<td>0.6128</td>
<td>5.1834</td>
<td>78</td>
<td>2.3751</td>
<td>Reject Null Hypothesis</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>40</td>
<td>2.55</td>
<td>2.305</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graph No.23**: Graph of Mean Post-test Scores in R.S.E.C. of STSA Vs Groups

**Observation**

From the above table and graph it is clear that

1. For respect to scientific experiments component of STSA, the mean score of experimental group is 3.95 and the mean score of control group is 2.55.
2. Standard deviation of the experimental group is 0.6128 and standard deviation of the control group is 2.305.
3. Calculated value of ‘t’ is 5.1834.
4. Degree of freedom is 78.
5. Table value of ‘t’ is 2.3751
6. Null hypothesis was rejected and the research hypothesis was accepted.
**Interpretation**

As t-calculated value is greater than table value. Therefore, the researcher rejected the null hypothesis and accepted the research hypothesis at 0.01 level of significance.

**Finding**

The programme for developing scientific attitude is helpful for enhancing the level of students respect for scientific experiments.

Thus, the data analysis and the interpretation has been given in this chapter. The next chapter deals with the summary, conclusions and recommendations.