Chapter – 4

Analysis and Interpretation of Data

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Chapter – 4

Analysis and Interpretation of Data

4.1 Introduction

The present chapter – 4 deals with very important component of research. Some hypotheses are tested before conducting study. The data are analyzed and interpreted in context of hypotheses.

In this chapter, investigator has tried to show statistical analysis and interpretation of data collected during experiment.

4.2 One way Covariance Analysis and Interpretation of Data

In this study, according to the objective – 1 for the testing of hypothesis – 1 one way co variance analysis was calculated, which results are shown in table – 4.1.

Table – 4.1
One Way Co-variance of Score of Post Test of Experimental Group and Controlled Group Students

<table>
<thead>
<tr>
<th>Origin of Variance</th>
<th>df</th>
<th>(SS(yx))</th>
<th>(MS (yx))</th>
<th>F-value</th>
<th>Table value of F-value for 0.05 and 0.01 level</th>
<th>Significance of F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>516.77</td>
<td>516.77</td>
<td>33.3</td>
<td>4.00 and 7.08</td>
<td>Significant at 0.01</td>
</tr>
<tr>
<td>Within Groups</td>
<td>61</td>
<td>946.92</td>
<td>15.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>62</td>
<td>1463.68</td>
<td>532.29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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According to table – 4.1, for df = 1 and df = 61, the F value is at 0.05 4.00 and 0.01 level 7.08. This is less then 33.3 calculated F - value. So, hypothesis – 1. “There is no significant difference between improve mean of post –test score of experimental group and controlled group as taken pre-test score of students on “Expansion” unit of Grade -8 Maths as co – variable is rejected that means there is significant difference between mean score of post –test of experimental group and controlled group students of post –test of experimental group and controlled group improved Y mean of experimental group and controlled group calculation of improved means Y.”

\[ M_{yx}=M_y-bw (M_x-M_{x_{total}}) \]

Where; \( M_{yx} \) = Improved mean of respective group of
\( M_y \) = Mean of a Score of respective group
\( Bw \) = coefficient of correlation within group
\( M_x \) = Mean Score of X of relevant group
\( M_{x_{total}} \) = Total mean of X score of all groups.

For Experimental Group A,

\[ M_{yx}=M_y-bw (M_{x_{}}-M_{x_{total}}) \]

\[ = 15.81-(0.80) (2.69-2.41) \]
\[ = 15.81 – (0.80) (0.28) \]
\[ = 15.586 \]

For Experimental Group B,

\[ M_{yx}=M_y-bw (M_{x_{}}-M_{x_{total}}) \]

\[ = 9.58- (0.80) (2.13-2.41) \]
\[ = 9.58 – (0.80) (-0.28) \]
\[ = 9.59 + 0.224 \]
\[ = 9.814 \]
Standard of difference between Mean

\[ SE_D = SD_{YX} \sqrt{\frac{1}{N_1} \frac{1}{N_2}} + \]

; \( SD_{YX} = \sqrt{MS_{WYX}} \)

= \sqrt{15.52}

= 3.94

\[ \therefore SE_D = 3.94 \sqrt{\frac{1}{32} + \frac{1}{32}} \]

= 3.94 \sqrt{\frac{1}{32}}

= 3.94 \times 0.25

= 0.98

Value of Significant difference value at 0.05 = \( t \times SE_D \)

= 1.96 \times 0.98 = 1.93

Value of Significant difference at 0.01 = \( t \times SE_D \)

= 2.58 \times 0.98 = 2.54
Table 4.2
Difference and Significance between Improved Y Mean according to Group

<table>
<thead>
<tr>
<th>Experimental Group A</th>
<th>Controlled Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>A</td>
<td>32</td>
</tr>
<tr>
<td>B</td>
<td>32</td>
</tr>
</tbody>
</table>

According to table – 4.2, the improve Mean of experimental group and controlled group is respectively 15.59 and 9.81. The difference between this improved Mean is 5.78 or mean difference for t-value is at 0.05 level 1.93 and at 0.01 level 2.54 while the difference of Improve mean of both group is 5.78, which is high / more then the necessary difference and it is significant at 0.01 level.

Thus, improve Mean of experimental group is more then the improve Mean of controlled group. So, it can say that teaching through vedic method is more effective then the traditional method.

4.3 3x2 Factorial Covariance Analysis of Data

4.3.1 Analysis and Interpretation of Data for testing effect of Achievement level and Teaching Method on Dependent Variable

In the present study 3x2 factorial co variance analyses was calculated to test according to specific objectives no. 2 and 3 hypothesis no. 2 and 3 that is depicted in table 4.3.
Table – 4.3
3 X 2 Factorial Covariance Analysis of Data of Achievement Level and Teaching Method after removing Effect of Pre-Test Scores

<table>
<thead>
<tr>
<th>Origin of Variance</th>
<th>df</th>
<th>Mean of improved squares</th>
<th>Mean of squares</th>
<th>F - value</th>
<th>Significance of F –value at 0.05 and 0.01 level</th>
<th>Significance Level of obtained F - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A – teaching method</td>
<td>1</td>
<td>520.83</td>
<td>820.83</td>
<td>37.58</td>
<td>4.00 and 7.08</td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>B – Achievement level</td>
<td>2</td>
<td>92.26</td>
<td>46.13</td>
<td>3.33</td>
<td>3.15 and 4.98</td>
<td>Not Significant at 0.01 level</td>
</tr>
<tr>
<td>AXB interaction</td>
<td>2</td>
<td>64.17</td>
<td>32.08</td>
<td>2.45</td>
<td>3.15 and 4.98</td>
<td>Not Significant at 0.01 level</td>
</tr>
<tr>
<td>Between groups</td>
<td>57</td>
<td>789.93</td>
<td>13.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As depicted in table – 4.3,

1) According to table of testing F –value df= 2 to df = 57, F – values is 0.05 level 3.15 and at 0.01 level 4.98. While calculated F –value for achievement level is 3.33 that is not significant at 0.01 level. So, hypothesis no. 2 “There is significant effect between mean score of post-test of achievement level as taken pre-test score of students on ‘Expansion’ unit of Maths subject of Std. – 8 as co variable.”

2) is accepted. T means there is no effect of achievement level on post-test scores.
3) The calculated F value obtained by interaction of teaching method and achievement level is 2.45. According to df = 2 to df = 57, F value is at 0.05 level 3.15 and at 0.01 level 4.98. Calculated F value is not significant at 0.05 level means hypothesis -3 “…….” is accepted. It shows there is no effect of interaction of achievement level and teaching method on post-test scores.

4.4 Analysis and Interpretation of Experiment of Students’ Opinion

Analysis of opinions of experiment group taken in opinionnaire at the end of experiment is given in table – 4.4

Table – 4.4
Analysis of Students’ Opinion of Experimental Group about Teaching by Vedic Method

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item</th>
<th>Agree</th>
<th>Neutral</th>
<th>Not Agree</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>‘Expansion’ unit can easily understand by Vedic maths.</td>
<td>30 (93.75%)</td>
<td>2 (6.25%)</td>
<td>0 (00.00%)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>The Expansion sums can calculate very fast by Vedic maths.</td>
<td>26 (81.25%)</td>
<td>6 (18.75%)</td>
<td>0 (00.00%)</td>
<td>4.5</td>
</tr>
<tr>
<td>3</td>
<td>We have interest in learning Expansion unit by Vedic maths.</td>
<td>25 (78.12%)</td>
<td>6 (18.75%)</td>
<td>1 (3.13%)</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Curiosity develops for more learning by Vedic maths.</td>
<td>24 (75.00%)</td>
<td>6 (18.75%)</td>
<td>2 (6.25%)</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>The Expansion unit taught by Vedic maths will always remember.</td>
<td>27 (84.32%)</td>
<td>4 (12.50%)</td>
<td>1 (3.18%)</td>
<td>2.5</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Item</td>
<td>Agree</td>
<td>Neutral</td>
<td>Not Agree</td>
<td>Rank</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>6</td>
<td>Learning by Vedic maths waste time.</td>
<td>4 (12.50%)</td>
<td>2 (6.25%)</td>
<td>26 (81.25%)</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Other unit of Maths should also teach by Vedic maths.</td>
<td>25 (78.12%)</td>
<td>5 (15.63%)</td>
<td>2 (6.25%)</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Maths learning can be interesting by Vedic maths.</td>
<td>27 (84.37%)</td>
<td>4 (12.5%)</td>
<td>1 (3.13%)</td>
<td>2.5</td>
</tr>
<tr>
<td>9</td>
<td>Vedic maths should include in curriculum.</td>
<td>26 (81.25%)</td>
<td>6 (18.75%)</td>
<td>0 (18.75%)</td>
<td>4.5</td>
</tr>
<tr>
<td>10</td>
<td>We get advantage of new innovative method.</td>
<td>25 (78.12%)</td>
<td>4 (12.50%)</td>
<td>3 (9.38%)</td>
<td>7</td>
</tr>
</tbody>
</table>

Table – 4.4 describes that, the percentage of totally agree on each item having (12.5% to 93.75%) range. The percentage of totally disagree is having (0.00% to 9.375%) range and percentage of neutral is having (6.25% to 18.75%) range.

Clearly can say on the basis of result that,

- According to opinion of 93.75% students the unit Expansion can easily understand by Vedic maths.
- According to opinion of 84.37 students, the unit ‘Expansion’ taught by Vedic maths can remember for long time and maths can make interesting by Vedic maths.
- According to opinion of 81.25% students that the sums of Expansion can calculate very fast by Vedic maths or even they believe Vedic maths should include in curriculum.
➢ According to opinion 78.12% students other units should also teach by Vedic maths.

➢ Curiosity developed in 75% students for more study of Vedic maths.

4.5 Conclusion

In the present chapter analysis and interpretation of data obtain at the end of teaching by Vedic maths. Investigator has also discussed about the hypotheses testing.