CHAPTER - V

ANALYSIS AND INTERPRETATION OF DATA

5.0 INTRODUCTION -

In the present study, the five different teaching strategies were compared in their effects on achievement in Educational Psychology. It is an experimental study in which the post-test only control group design was used. The study was conducted on 120 student teachers of B.Ed. class. The college selected for the study was located in Satara (Maharashtra) city.

The independent variables were the strategies of teaching, while the achievement in Educational Psychology was the dependent variable. The moderate variable in the study were intelligence, qualification and surrounding.

The two different groups were equated statistically by applying Mental Ability Test, Teacher Attitude Inventery and CET + Academic score. The 120 student teachers of class B.Ed. from Azad College of Education, Satara were selected as two groups. For experimental group lecture supporting methods were used. For experimental group E was taught through Symposium, Seminar, Group Discussion and Brainstorming method respectively. The control group C was taught through lecture method.

The investigator selected about 16 sub units from the syllabus of Educational Psychology for B.Ed. class. The same content was taught to all the two groups for same duration by using different teaching strategies.

Statistical analysis like mean, standard deviation and t-test were employed to the data to know the different effects of the treatment.

After the treatment of each unit, a post test i.e. achievement test in Educational Psychology on respective sub unit was administered and the relative effectiveness was determined.
To see the effects of teaching strategies, Symposium, Seminar, Group Discussion, Brainstorming method, tests were conducted on different sub units in Educational Psychology. The results were given below.

A) SYMPOSIUM METHOD -

5.1. Relative Effectiveness of Symposium Method and Lecture Method-

To see the effect of teaching using Symposium method tests were conducted on different units in Educational Psychology. The units are given below.

- Unit - I - Group Dynamics
- Unit - II - Image, Imagery
- Unit - III - Education of Exceptional Children
- Unit - IV - Imagination

Unit Test I on - Group Dynamics -

The sub unit ‘Group Dynamics’ from Educational Psychology was taught to experimental group using symposium method and control group by using lecture method.

In the present study, symposium method and lecture method are the independent variables, while the achievement in Educational Psychology was the dependent variable. After treatment, test was administrated and results are given in the following tables.

5.1.1 Relative effectiveness of experimental group using symposium method and control group using lecture method on achievement test related to sub unit ‘Group Dynamics’.

The objective of the study is stated as -

O₁ To study the comparative effectiveness of symposium method and lecture method in terms of student teachers achievement in the unit test based on sub unit ‘Group Dynamics’.

The null hypothesis formulated for the objective is -
\( H_1 \) There is no significant difference between student teachers achievement in the unit test after using symposium method and lecture method of teaching.

To test the hypothesis \( (H_1) \) t-test was applied.

**Table 5.1**

Relative Effectiveness of Symposium Method and Lecture Method on achievement test based on the subunit ‘Group Dynamics’

| Sr. No. | Group                | N  | Mean (X) | SD  | df  | t-value  \\
|---------|----------------------|----|----------|-----|-----|----------|
| 1       | Symposium Group      | 60 | 18.75    | 4.72| 118 | 7.92 **  \\
| 2       | Lecture Method Group | 60 | 11.75    | 4.95|     |          |

Table value for \( df_{118} = 0.05 \) level = 1.98

0.01 level = 2.62

Calculated \( t \)-value = 7.92

** Significant at 0.01 level

**Observation and Interpretation** -

1. The mean of symposium group on achievement test is 18.75.
   The mean of lecture method group on achievement test is 11.75
   The difference between the two means is 7.0.
   Mean of symposium group is greater than mean of lecture method.

2. The SD of symposium group is 4.72.
   The SD of lecture method is 4.95.
   The difference between SD group is 0.23.
   SDs of the both the groups are nearly equal i.e. homogenous.

3. The calculated \( t \)-value is 7.92 which is significant at 0.01 level
   Thus the hypothesis \( H_1 \) is rejected.
Findings -

1. It was noted that the performance of student teachers who used symposium method with awareness proved more effective than those who used only lecture method.

2. It was found that the presenting and explaining the symposium procedure with the improved knowledge of displaying concepts helped the students more clearly. It sharpens the students ideas and concepts by forcing them to express in their own words. This facilitates intellectual comprehension of new knowledge hence the performance of the Symposium was better.

Unit Test II on - Image and Imagery

5.1.2 Relative effectiveness of experimental group using symposium method and control group using lecture method on achievement test related to subunit ‘Image and Imagery’.

The objective of the study is stated as -

O₂ To study the comparative effectiveness of symposium method and lecture method in terms of student teachers achievement in the unit test based on subunit ‘Image and Imagery’.

Its corresponding null hypothesis is stated as -

H₂ There is no significant difference between student teachers’ achievement in the unit test after using symposium method and lecture method of teaching.

To test the hypothesis (H₂) t-test was applied and the result are given in the table 5.2.
Table 5.2

Relative Effectiveness of Symposium Method and Lecture Method on achievement test on the sub unit ‘Image and Imagery’

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Symposium Group</td>
<td>59</td>
<td>17.50</td>
<td>4.05</td>
<td>117</td>
<td>9.87 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>10.08</td>
<td>4.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for $df_{117} = 0.05$ level $= 1.98$

$0.01$ level $= 2.62$

Calculated t-value $= 9.87$

** Significant at 0.01 level

Observation and Interpretation -

1. The mean of experimental group by using symposium method on achievement test is 17.50.
   
The mean of control group using lecture method group on achievement test is 10.08.
   
The difference between the two means is 7.42.
   
Mean of experimental group is greater than the mean of control group.

2. The SD of symposium group is 4.05.
   
The SD of lecture method group is 4.19.
   
The difference between the SD groups is 0.14.
   
SDs of the both the groups are nearly equal i.e. homogenous.

3. The calculated t-value is 9.87 which is significant at 0.01 level.
   
Thus, the hypothesis $H_2$ is rejected.
Findings -

1. The achievement of the student teachers taught by symposium method is better than the achievement of student teachers taught by lecture method.

2. It promotes student teachers’ interest by giving the students a share in the responsibility for the course and in search for knowledge. This compels the students to be active learners, and is quite contrary to the lecturing method which affected student teachers’ performance.

Unit Test III on - Education of Exceptional Children -

5.1.3 Relative effectiveness of experimental group using symposium method and control group using lecture method on achievement test related to subunit ‘Education of exceptional children’.

The objective of the study is stated as -

$O_3$ To study the comparative effectiveness of symposium method and lecture method in terms of student teachers’ achievement in the unit test based on subunit ‘Education of exceptional children’.

The null hypothesis formulated for the objective is as follows -

$H_3$ There is no significant difference between student teachers’ achievement in the unit test after using symposium method and lecture method of teaching.

To test the hypothesis ($H_3$) t-test was applied.

Table 5.3

Relative Effectiveness of Symposium Method and Lecture Method on achievement test on the subunit ‘Education of Exceptional Children’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Symposium Group</td>
<td>60</td>
<td>19.25</td>
<td>5.11</td>
<td>118</td>
<td>8.90**</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>11.25</td>
<td>4.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table value for $df_{118} = 0.05$ level = 1.98
0.01 level = 2.62

Calculated $t$-value = 8.90

** Significant at 0.01 level

**Observation and Interpretation** -

1. The mean of experimental group by using symposium method on achievement test is 19.25.

The mean of control group using lecture method group on achievement test is 11.25.

The difference between the two means is 8.0.

The mean of symposium group is greater than mean of lecture method group.

2. The SD of symposium group is 5.11.

The SD of lecture method group is 4.72.

The difference between SD groups is 0.39.

There is no much difference in SDs. of both the groups. That is simply 0.39.

3. The calculated $t$-value is 8.90 which is significant at 0.01 level

Thus the hypothesis $H_3$ is rejected.

**Findings** -

1. Teaching through symposium method encouraged student teachers to draw conclusions independently and ability of drawing conclusions led to more clarity of knowledge as compared to lecture method.

2. Explanation of the problem proved very useful to the student teachers to develop the ability to select the appropriate solutions to the problem that casued the difference.

3. In symposium method effective presentation of content and seeking clarification there in, on the part of the learner creates the difference in their performance.
Unit Test IV on - Imagination -

5.1.4 Relative effectiveness of experimental group using symposium method and that of control group using lecture method on achievement test related to sub unit ‘Imagination’.

The objective of the study is stated as -

\[ O_4 \] To study the comparative effectiveness of symposium method and lecture methods in terms of student teachers’ achievement in the unit test based on subunit of ‘Imagination’.

Its corresponding null hypothesis is stated as -

\[ H_4 \] There is no significant difference between student teachers’ achievement in the unit test after using symposium method and lecture method of teaching.

To test the hypothesis \( (H_4) \) t-test was applied and result were given in the table 5.4.

**Table 5.4**

Relative Effectiveness of Symposium Method and Lecture Method on achievement test related to the subunit ‘Imagination’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Symposium Group</td>
<td>58</td>
<td>19.67</td>
<td>4.37</td>
<td>116</td>
<td>9.69 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>11.33</td>
<td>4.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for \( df_{116} = 0.05 \) level = 1.98

\[ 0.01 \) level = 2.62

Calculated t-value = 9.96

** Significant at 0.01 level
**Observation and Interpretation -**

1. The mean of symposium group on achievement test is 19.67.
   The mean of lecture method group on achievement test is 11.33.
   The difference between two means is 8.34.
   The mean of symposium group is greater than mean of lecture method.

2. The SD of experimental group using symposium is 4.37.
   The SD of Lecture method group is 4.95.
   The difference between two SDs groups is 0.58.
   There is no much difference in the SDs of both the group from the means.

3. The calculated t-value is 9.69, which is significant at 0.01 level.
   Thus the Hypothesis H₄ is rejected.

**Findings -**

1. Teaching only by symposium method seemed to be more effective than teaching with lecture method as it supported by knowledge of achieving high levels of cognition.

2. It helped the students to think rationally and present the content systematically.
   Hence the performance of symposium group was better.
B) SEMINAR METHOD -

5.2 Relative Effectiveness of Seminar Method and Lecture Method -

To see the effect of teaching Seminar Method tests were conducted on different units in Educational Psychology. The units are given below.

- Unit - V - Learning Process
- Unit - VI - Factors Affecting Process of Learning
- Unit - VII - Thinking and Reasoning Process
- Unit - VIII - Transfer of Learning

Unit Test V - Learning Process -

The subunit ‘Learning Process’ of Educational Psychology was taught to the experimental group using seminar method. The same sub unit was taught to control group by using lecture method.

In this case teaching strategies, seminar method and lecture method of teaching are the independent variables. While the achievement in Educational Psychology is the dependent variable. After treatment, test was administrated and the results are given below.

5.2.1 Relative effectiveness of experimental group using seminar method and that of control group using lecture method on achievement test related to subunit ‘Learning Process’.

The objective of the study is stated as -

O₃ To study the comparative effectiveness of seminar method and lecture method in terms of student teachers’ achievement in the unit test based on subunit ‘Learning Process’.

The null hypothesis formulated for the objective is as follows.

H₃ There is no significant difference between student teachers’ achievement in the unit test, after using seminar method and lecture method of teaching.

To test the hypothesis (H₃)t-test was applied.
Table 5.5

Relative Effectiveness of Seminar Method and Lecture Method on achievement test based on the subunit ‘Learning Process’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seminar Group</td>
<td>60</td>
<td>18.67</td>
<td>4.93</td>
<td>116</td>
<td>7.42</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>58</td>
<td>11.60</td>
<td>5.39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for $df_{116} = 0.05$ level = 1.98
0.01 level = 2.62

Calculated $t$-value = 7.42

** Significant at 0.01 level

Observation and Interpretation -

1. The mean of achievement test of seminar group and lecture method group are 18.67 and 11.60 respectively.
   The difference between two means is 7.0.
   The mean of seminar group is greater than the mean of lecture method group.

2. The SD of seminar group is 4.93.
   The SD of Lecture group is 5.39.
   The difference between two SDs groups is 0.46.
   There is no much difference in the SDs of both the group from the means

3. The calculated $t$-value is 7.42 which is significant at 0.01 level.
   Thus, the Hypothesis $H_3$ is rejected.

Findings -

From the above observations and interpretations it was found that
1. The performance of student teachers’ from the seminar method group is better than that of control group.

2. In seminar, self-learning, self-discovery habit of student teachers creates the difference in their performance.

3. It helped the student teacher’s to think analytically and critically so the performance of seminar group was better.

Unit Test VI - Factors Affecting Process of Learning

5.2.2 Relative effectiveness of experimental group using seminar method and control group using lecture method on achievement test related to subunit ‘Factors affecting Process of Learning’.

The objective of the study is stated as -

Oₐ To study the comparative effectiveness of seminar method and lecture method in terms of student teachers’ achievement in the unit test based on subunit. ‘Factors affecting process of learning’.

The counter null hypothesis is states as,

Hₐ There is no significant difference between student teachers’ achievement in the unit test, after using seminar method and lecture method of teaching.

To test the hypothesis (Hₐ), t-test is employed and results are shown in table 5.6.

Table 5.6

Relative Effectiveness of Seminar Method and Lecture Method on achievement test for subunit ‘Factors Affecting Process of Learning’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seminar Group</td>
<td>60</td>
<td>19.16</td>
<td>4.41</td>
<td>116</td>
<td>8.44 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>58</td>
<td>11.83</td>
<td>5.07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table value for $df_{116} = 0.05$ level = 1.98

0.01 level = 2.62

Calculated $t$-value = 8.44

** Significant at 0.01 level

**Observation and Interpretation** -

1. The mean of achievement test of experimental group using seminar method is 19.16 and the mean of control group using lecture method group is 11.83.

   The difference between two means is 7.33.

   The mean of seminar group is greater than the mean of lecture method group.

2. The SD of seminar group is 4.41.

   The SD of lecture method group is 5.07.

   The difference between the two SDs groups is 0.66.

   There is no much difference in the SDs of both the group from the means

3. The calculated $t$-value is 8.44 which is significant at 0.01 level.

   Thus, the Hypothesis $H_0$ is rejected.

**Findings** -

1. From the above observations and interpretations it was found that the seminar method is more effective than lecture method.

2. The procedure of seminar method requires selection of proper learning experiences and their systematic arrangement besides the habit of seeking references and previous readings which favourably affected student teachers’ performance.
Unit Test VII - Thinking and Reasoning Process -

5.2.3 Relative effectiveness of experimental group using seminar method and control group using lecture method on achievement test related to subunit ‘Thinking and Reasoning Process’.

The objective of the study is stated as -

O<sub>7</sub> To study the comparative effectiveness of seminar method and lecture method in terms of student teachers’ achievement in the unit test based on subunit ‘Thinking and Reasoning Process’.

The corresponding null hypothesis is formulated as.

H<sub>7</sub> There is no significant difference between student teachers achievement in the unit test, after using seminar method and lecture method of teaching.

To test the hypothesis H<sub>7</sub> t-test were applied and results were given in the table.

**Table 5.7**

Relative Effectiveness of Seminar Method and Lecture Method on achievement test for subunit ‘Thinking and Reasoning Process’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seminar Group</td>
<td>60</td>
<td>19.66</td>
<td>4.23</td>
<td>117</td>
<td>10.10 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>59</td>
<td>11.41</td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for df<sub>117</sub> = 0.05 level = 1.98

0.01 level = 2.62

Calculated t-value = 10.10

** Significant at 0.01 level
Observation and Interpretation -

1. The mean of experimental group using seminar method on achievement test is 19.66.
   The mean of control group using lecture method group on achievement test is 11.41.
   The difference between two means is 8.25.
   The mean of seminar group is greater than the mean of lecture method group.

2. The SD of seminar group is 4.23.
   The SD of lecture method group is 4.70
   The difference between the two SDs groups is 0.47.
   There is no much difference in the SDs of both the group from the means

3. The calculated t-value is 10.10 which is significant at 0.01 level.
   Thus the Hypothesis H, is rejected.

Findings -

From the above observations and interpretations it was found that

1. The teaching strategy, seminar method is more effective than lecture method for teaching unit ‘Thinking and Reasoning Process’.

2. Students’ sense of responsibility and co-operation as well as the powers of self-reliance and self-confidence in seminar positively influenced students’ performance.

3. Students’ abilities to deep into the matter and deriving principles from the context created the difference in their performance as compared to the conventional group.
Unit Test VIII - Transfer of Learning -

5.2.4 Relative effectiveness of experimental group using seminar method and control group using lecture method on achievement test related to subunit ‘Transfer of Learning’.

The objective of the study is stated as -

O8 To study the comparative effectiveness of seminar method and lecture method in terms of student teachers’ achievement in the unit test based on subunit ‘Transfer of Learning’.

The counter null hypothesis is stated as

H8 There is no significant difference between student teachers’ achievement in the unit test after using seminar method and lecture method of teaching.

To test the hypothesis (H8) t-test were applied and results were given in the table 5.8.

Table 5.8

Relative Effectiveness of Seminar Method and Lecture Method on achievement test for the subunit ‘Transfer of Learning’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seminar Group</td>
<td>60</td>
<td>18.66</td>
<td>4.53</td>
<td>118</td>
<td>8.26 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>11.75</td>
<td>4.63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for df_{118} = 0.05 level = 1.98

0.01 level = 2.62

Calculated t-value = 8.26

** Significant at 0.01 level
Observation and Interpretation -

1. The mean of achievement test of seminar group is 18.66 and the mean of lecture method group is 11.75.
   The difference between two means is 6.91.
   The mean of experimental group is greater than the mean of control group.

2. The SD of seminar group is 4.53.
   The SD of lecture method group is 4.63
   The difference between two SDs groups is 0.10.
   There is no much difference in the SDs of both the group from the means

3. The calculated t-value is 8.26 which is significant at 0.01 level.
   Thus, the Hypothesis $H_0$ is rejected.

Findings -

From the above observations and interpretations it was found that

1. The achievement of student teachers’ taught by seminar method is better than the achievement of student teachers’ taught by lecture method.

2. It promoted the student teachers for active participation in the classroom and helped the student teachers for the development of higher cognitive abilities.
C) GROUP DISCUSSION -

5.3 Relative Effectiveness of Group Discussion and Lecture Method-

To see the effect of teaching Group Discussion Method tests were conducted on different units in Educational Psychology. The units are given below.

Unit - IX  -  Methods of Educational Psychology
Unit - X  -  Factors Influencing Personality Development
Unit - XI  -  Different Stages of Growth and Development
Unit - XII -  Memory Techniques

Unit Test IX - Methods of Educational Psychology -

In the case teaching strategies, group discussion and lecture methods of teaching are the independent variables. While the achievement in Educational Psychology is the dependent variable. After treatment, test was administered and the results are given below.

5.3.1 Relative effectiveness of experimental group using group discussion method and control group using lecture method on achievement test related to subunit ‘Methods of Educational Psychology’.

The objective of the study is stated as -

O₉  To study the comparative effectiveness of Group Discussion method and Lecture Method in terms of student teachers achievement in the unit test based on subunit ‘Methods of Educational Psychology’.

The null hypothesis formulated for the objective is as follows -

H₉  There is no significant difference between student teachers achievement in the unit test after using group discussion method and lecture method of teaching.

To test the hypothesis (H₉) t-test were applied.
Table 5.9
Relative Effectiveness of Group Discussion and Lecture Method on achievement test for the subunit 'Methods of Educational Psychology'

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Discussion</td>
<td>60</td>
<td>16.83</td>
<td>3.86</td>
<td>118</td>
<td>7.48</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>11.00</td>
<td>4.63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for df_{118} = 0.05 level = 1.98

0.01 level = 2.62

Calculated t-value = 7.48

** Significant at 0.01 level

Observation and Interpretation -

1. The mean of experimental group using group discussion method on achievement test is 16.83.
   The mean of control group using lecture method group on achievement test is 11.00.
   The difference between two means is 5.83.
   The mean of group discussion is greater than the mean of lecture method group.

2. The SD of group discussion is 3.86.
   The SD of lecture method group is 4.63.
   There is no much difference in the SDs of both the group. That is simply 0.77.

3. The calculated t-value is 7.48 which is significant at 0.01 level.
   Thus the Hypothesis H₀ is rejected.
Findings -

From the above observations and interpretations it was found that

1. The use of group discussion method promoted student teachers to ask more and more questions to gather sufficient information and draw appropriate conclusions with the help of acquired information independently, thus curiosity develops their performance.

Hence the use of group discussion method is more effective than lecture method.

3. The student teachers capacities to explore ideas, expands understanding and causes the difference in relating facts.

Unit Test X - Factors Influencing Personality Development -

The subunit ‘Factors influencing personality development’ were taught to the experimental group using group discussion method. The same sub units were taught to control group by using lecture method.

In this case teaching strategies group discussion method and lecture method of teaching are the independent variables, while the achievement in Educational Psychology is the dependent variable. After treatment test was administered and the results are given below.

5.3.2 Relative effectiveness of experiential group using group discussion and control group using lecture method on achievement test related to subunit ‘Factors Influencing Personality Development’.

The objective of the study is stated as -

\[ O_{10} \]

To study the comparative effectiveness of group discussion method and lecture method in terms of student teachers’ achievement in the unit test based on subunit ‘Factors Influencing Personality Development’.

The null hypothesis formulated for the objective is as follows -

\[ H_{10} \]

There is no significant difference between student teachers’ achievement in the unit test after using group discussion method and lecture method of teaching.
To test the hypothesis \((H_{10})\) t-test were applied.

**Table 5.10**

Relative Effectiveness of Group Discussion and Lecture Method on achievement test for the subunit ‘Factors Influencing Personality Development’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Discussion</td>
<td>60</td>
<td>17.58</td>
<td>3.98</td>
<td>118</td>
<td>9.60 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>10.75</td>
<td>3.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for \(df_{118} = 0.05\) level = 1.98
0.01 level = 2.62

Calculated \(t\)-value = 9.60

** Significant at 0.01 level

**Observation and Interpretation** -

1. The mean of achievement test of group discussion group is 17.58.
The mean of lecture group is 10.75.
The difference between two means is 6.83.
The mean of group discussion is greater than the mean of lecture method group.

2. The SD of group discussion is 3.98.
The SD of lecture method group is 3.72.
The difference between two SDs is 0.26.
There is no much difference in the SDs of both the group from the means.

3. The calculated \(t\)-value is 9.60 which is significant at 0.01 level.
Thus, the Hypothesis \(H_{10}\) is rejected.
Findings -

From the above observations and interpretations it was found that

1. The performance of student teachers having group discussion method is better than that of student teachers having knowledge of only lecture method.

2. In group discussion student teachers’ make suggestion, provide facts, share responsibilities and have interactions within members and communication with each other that enhanced their performance

Unit Test XI -  Stages of Growth and Development -

5.3.3 Relative effectiveness of experimental group using group discussion and control group using lecture method on achievement test related to subunit ‘Stages of Growth and Development’.

The objective of the study is stated as -

O$_{11}$ To study the comparative effectiveness of group discussion method and lecture method in terms of student teachers’ achievement in the unit test based on the subunit ‘Different stages of Growth and Development.

The null hypothesis formulated for the objective is as follows -

H$_{11}$ There is no significant difference between student teachers’ achievement in the unit test, after using group discussion method and lecture method of teaching.

To test the hypothesis (H$_{11}$) t-test were applied.
Table 5.11

Relative Effectiveness of Group Discussion and Lecture Method on achievement test for the subunit ‘Stages of Growth and Development’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Discussion</td>
<td>60</td>
<td>17.41</td>
<td>4.11</td>
<td>118</td>
<td>8.89</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>10.58</td>
<td>4.29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for $df_{118} = 0.05$ level = 1.98

0.01 level = 2.62

Calculated t-value = 8.89

** Significant at 0.01 level

Observation and Interpretation -

1. The mean of achievement test of group discussion is 17.41.
   The mean of lecture method group is 10.58.
   The difference between two means is 6.83.
   The mean of group discussion is greater than the mean of lecture method.

2. The SD of group discussion is 4.11.
   The SD of lecture method group is 4.20.
   The difference between the two SDs is 0.9.
   There is no much difference in the SDs of both the group from the means.

3. The calculated t-value is 8.89 which is significant at 0.01 level.
   Thus, the Hypothesis $H_{11}$ is rejected.
Findings -

From the above observations and interpretations it was found that

1. The effect of group discussion method proved effective than that of lecture method.

2. Group discussion helped the students to crystalise the thoughts and concepts relating to the topic, similarly it helped them for intellectual team work for working out the details and seeking solution to the problems.

3. The process of self-discovery, self-understanding and developing the sense of self-assertiveness in Group discussion developed the performance better.

Unit Test XII - Memory -

The subunit ‘Memory ’ of Educational Psychology was taught to experimental group using group discussion and control group using lecture method.

The teaching strategy group discussion method and lecture method are independent variables while the achievement in Educational Psychology is the dependent variable.

After treatment post-test was administered on the same unit. The results are given in the following table.

5.3.4 Relative effectiveness of experimental group using group discussion method and control group using lecture method on achievement related to the subunit ‘Memory ’.

The objective of the study is stated as -

$O_{12}$ To study the comparative effectiveness of group discussion method and lecture method in terms of student teachers’ achievement in the unit test based on the subunit ‘Memory’.

The null hypothesis formulated for the objective is as follows -
There is no significant difference between student teachers’ achievement in the unit test, after using group discussion method and lecture method of teaching.

To test the hypothesis (H₁₂) t-test was applied.

**Table 5.12**

Relative Effectiveness of Group Discussion and Lecture Method on achievement test for the subunit ‘Memory’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Discussion</td>
<td>60</td>
<td>18.58</td>
<td>4.42</td>
<td>118</td>
<td>6.65</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>12.66</td>
<td>5.28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for df₁₁₈ = 0.05 level = 1.98

0.01 level = 2.62

Calculated t-value = 6.65

** Significant at 0.01 level

**Observation and Interpretation** -

1. The mean of achievement test of group discussion is 18.58.
The mean of lecture method group is 12.66.
The difference between two means is 5.92.
The mean of group discussion method is greater than that of mean of lecture method.

2. The SD of group discussion is 4.42.
The SD of lecture method group is 5.28.
The difference between two SDs is 0.86.
There is no much difference in the SDs of both the group from the means.
3. The calculated t-value is 6.65 which is significant at 0.01 level.
Thus the Hypothesis $H_{12}$ is rejected.

Findings -

From the above observations and interpretations it was found that,

1. The performance of student teachers having knowledge of group discussion method is better than that of student teachers having knowledge of only lecture method.

2. The discussion method forced the students out of their classroom lethargy, so that every learner reacted either in support or in opposition to the issue under discussion. Hence the performance of group discussion is better.
D) BRAINSTORMING METHOD -

5.4 Relative Effectiveness of Brainstorming Method and Lecture Method -

To see the effect of teaching Brainstorming Group tests were conducted on different units in Educational Psychology. The units are given below.

Unit - XIII - Creativity
Unit - XIV - Perception
Unit - XV - Motivation
Unit - XVI - Mental Health

Unit Test XIII - Creativity -

The subunit ‘Creativity’ of Educational Psychology was taught to experimental group using Brainstorming Method and control group using Lecture Method.

The teaching strategy brainstorming method and lecture method are the independent variables while the achievement in Educational Psychology is the dependent variable.

After treatment post-test was administered on the same unit. The results are given in the following table.

5.4.1 Relative effectiveness of experimental group using brainstorming method and control group using lecture method on achievement test related to the subunit ‘Creativity’.

The objective of the study is stated as -

$O_{13}$ To study the comparative effectiveness of brainstorming method and lecture method in terms of student teachers’ achievement in the unit test based on the subunit ‘Creativity’.

The null hypothesis formulated for the objective is as follows -

$H_{13}$ There is no significant difference between student teachers’ achievement in the unit test, after using brainstorming method and lecture method of teaching.
To test the hypothesis \( (H_{13}) \), t-test was applied.

**Table 5.13**

Relative Effectiveness of Brainstorming Method and Lecture Method on achievement test for the subunit ‘Creativity’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brainstorming Group</td>
<td>60</td>
<td>12.75</td>
<td>5.00</td>
<td>118</td>
<td>2.6</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>10.33</td>
<td>4.90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for \( df_{118} = 0.05 \) level = 1.98  
0.01 level = 2.62

Calculated \( t \)-value = 2.60  
* Significant at 0.05 level

**Observation and Interpretation** -

1. The mean of achievement test of brainstorming group is 12.75.  
The mean of lecture method group is 10.33.  
The difference between two means is 2.42.  
The mean of brainstorming group is greater than the mean of lecture method group.

2. The SD of brainstorming group is 5.00.  
The SD of lecture method group is 4.90.  
The difference between two SDs is 0.10.  
There is no much difference in the SDs of both the group from the means.

3. The calculated \( t \)-value is 2.60 which is significant at 0.05 level.  
Thus, the Hypothesis \( H_{13} \) is rejected.
Findings -

From the above observations and interpretations it was found that,

1. The effect of brainstorming technique proved effective than that of lecture method.

2. Generation of new imaginative, concrete ideas and suggestions made difference in performance better.

Unit Test XIV - Perception -

The subunit ‘Perception’ of Educational Psychology was taught to experimental group using brainstorming method and control group using lecture method.

The teaching strategy brainstorming method and lecture method are the independent variables while the achievement in Educational Psychology is the dependent variable.

After treatment post-test was administered on the same unit. The results are given in the following table.

5.4.2 Relative effectiveness of experimental group using brainstorming method and control group using lecture method on achievement test related to subunit ‘Perception’.

The objective of the study is stated as -

O₁₄ To study the comparative effectiveness of brainstorming method and lecture method in terms of student teachers’ achievement in the unit test based on the subunit ‘Perception’.

The null hypothesis formulated for the objective is as follows -

H₁₄ There is no significant difference between student teachers’ achievement in the unit test, after using brainstorming method and lecture method of teaching.

To test the hypothesis (H₁₄) t-test was applied.
### Table 5.14

**Relative Effectiveness of Brainstorming Method and Lecture Method on achievement test on the sub unit ‘Perception’**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brainstorming Group</td>
<td>60</td>
<td>11.50</td>
<td>4.53</td>
<td>118</td>
<td>2.11 *</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>10.16</td>
<td>4.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for $df_{118} = 0.05$ level = 1.98

0.01 level = 2.62

Calculated t-value = 2.11

* Significant at 0.05 level

**Observation and Interpretation -**

1. The mean of achievement test of brainstorming group is 11.50.
   The mean of lecture method group is 10.16.
   The difference between the two means is 1.34.
   The mean of brainstorming group is greater than the mean of lecture method group.

2. The SD of brainstorming group is 4.53.
   The SD of lecture method group is 4.18.
   The difference between the two SDs is 0.35.
   There is no much difference in the SDs of both the group from the means.

3. The calculated t-value is 2.11 which is significant at 0.05 level.
   Thus the Hypothesis $H_{14}$ is rejected.

**Findings -**

From the above observations and interpretations it was found that,
1. The effect of brainstorming technique proved effective than that of lecture method.

2. Encouragement of creativity for solving specific problem with critical thinking makes the performance better in Brainstorming.

3. It was a creative group work in which group members produce large number of ideas quickly for subsequent evaluation. It improved group cohesiveness and hence the performance was better.

Unit Test XV - Motivation -

The sub unit ‘Motivation’ of Educational Psychology was taught to experimental group using brainstorming method and control group using lecture method.

The teaching strategy brainstorming method and lecture method are the independent variables while the achievement in Educational Psychology is the dependent variable.

After treatment post-test was administered on the same unit. The results are given in the following table.

5.4.3 Relative effectiveness of experimental group using brainstorming method and control group using lecture method on achievement test related to subunit ‘Motivation’.

The objective of the study is stated as -

\[ O_{15} \]

To study the comparative effectiveness of brainstorming method and lecture method in terms of student teachers’ achievement in the unit test based on the subunit ‘Motivation’.

The null hypothesis formulated for the objective is as follows -

\[ H_{15} \]

There is no significant difference between student teachers’ achievement in the unit test, after using brainstorming method and lecture method of teaching.

To test the hypothesis \((H_{15})\) t-test was applied.
Table 5.15
Relative Effectiveness of Brainstorming Method and Lecture Method on achievement test for the subunit ‘Motivation’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brainstorming Group</td>
<td>60</td>
<td>18.50</td>
<td>4.5</td>
<td>118</td>
<td>8.19 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>11.66</td>
<td>4.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for $t_{118}$ = 0.05 level = 1.98

0.01 level = 2.62

Calculated $t$-value = 8.19

** Significant at 0.01 level

Observation and Interpretation -

1. The mean of achievement test of brainstorming group is 18.50.
   The mean of lecture method group is 11.66.
   The difference between the two means is 7.84.
   The mean of brainstorming group is greater than the mean of lecture method group.

2. The SD of brainstorming group is 4.50.
   The SD of lecture method group is 4.64.
   The difference between the two SDs is 0.14.
   There is no much difference in the SDs of both the group from the means.

3. The calculated $t$-value is 8.19 which is significant at 0.01 level.
   Thus, the Hypothesis $H_{15}$ is rejected.

Findings -

From the above observations and interpretations it was found that,
1. The performance of student teachers having knowledge of brainstorming technique is better than that of student teachers, having knowledge of lecture method.

2. Brainstorming encourages full participation of all the students because all ideas were equally shared. It enacts as a motivation to generate new ideas. Hence students' performance was better.

Unit Test XVI - Mental Health -

The subunit ‘Mental Health’ of Educational Psychology was taught to experimental group using brainstorming method and control group using lecture method.

The teaching strategy brainstorming method and lecture method are the independent variables while the achievement in Educational Psychology is the dependent variable.

After treatment post-test was administered on the same unit. The results are given in the following table.

5.4.4 Relative effectiveness of experimental group using brainstorming method and control group using lecture method on achievement test related to subunit ‘Mental Health’.

The objective of the study is stated as -

O₁₆ To study the comparative effectiveness of brainstorming method and lecture method in terms of student teachers’ achievement in the unit test based on the subunit ‘Mental Health’.

The null hypothesis formulated for the objective is as follows -

H₁₆ There is no significant difference between student teachers’ achievement in the unit test, after using brainstorming method and lecture method of teaching.

To test the hypothesis ($H₁₆$) $t$-test was applied.
Table 5.16
Relative Effectiveness of Brainstorming Method and Lecture Method on achievement test for the subunit ‘Mental Health’

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>N</th>
<th>Mean (X)</th>
<th>SD</th>
<th>df</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brainstorming Group</td>
<td>60</td>
<td>19.50</td>
<td>4.33</td>
<td>118</td>
<td>9.46 **</td>
</tr>
<tr>
<td>2</td>
<td>Lecture Method Group</td>
<td>60</td>
<td>11.41</td>
<td>5.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table value for $df_{118} = 0.05$ level = 1.98

0.01 level = 2.62

Calculated t-value = 9.46

** Significant at 0.01 level

Observation and Interpretation -

1. The mean of achievement test of brainstorming group is 19.50.
The mean of lecture method group is 11.41.
The difference between the two means is 8.09.
The mean of bainstorming group is greater than the mean of lecture method group.

2. The SD of brainstorming group is 4.33.
The SD of lecture method group is 5.00.
The difference between two SDs is 0.67.
There is no much difference in the SDs of both the groups from the means.

9. The calculated t-value is 9.46 which is significant at 0.01 level.
Thus, the Hypothesis $H_{16}$ is rejected.

Findings -

From the above observations and interpretations it was found that,
1. The performance of students teachers’ having knowledge of brainstorming technique is better than that of student teachers’ having knowledge of lecture method.

2. It enriched their content knowledge with divergent thinking and useful for generating new imaginative ideas for answering a question. Hence performance was better.