CHAPTER IV
CHAPTER - IV

ANALYSIS AND INTERPRETATION OF THE DATA

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CHAPTER - IV
ANALYSIS AND INTERPRETATION OF THE DATA

Introduction

The results of the investigation are reported in this chapter under several headings. As indicated in chapter III, six independent variables and two dependent variables are used in the study. It is ideal to use Analysis of Variance provided the sample distributions satisfy certain assumptions. Due to unequal number of sample in the different levels of variables used in this study, application of independent 't' tests was found to be appropriate. The results of the study are shown as per the following scheme of analysis.

Section 1: Analysis of students' data on TPTT scale.

Section 2: Analysis of Teachers' data on TAIT? scale.

Section 3: Analysis of students' data on achievement.

Section 4: Correlation study between students' achievement and their attitude scores.
Section 1

Analysis of Students' Data on TPTT Scale

The main objectives of this study is to find out the effectiveness of in-service training programmes given to teachers on the achievement and attitude of their students. Attitude is considered to be a dependent factor and in this case it is studied on the basis of the teaching performance of the teachers as perceived by their students. For studying the attitude changes, a few hypotheses were formulated and tested.

In this section, hypotheses Ho1 to Ho7 are tested. The scheme of data analyses for the hypotheses testing are given as follows:

1.1. Analysis of pre-test and post-test data on TPTT scale in general.

1.2. Analysis of TPTT scale data on the basis of types of management of schools.
   i) Pre-test vs Post-test scores of students in government schools.
   ii) Pre-test vs Post-test scores of students in aided management schools.
   iii) Post-test scores of students in government schools vs students in aided management schools.
1.3. Analysis of TPTT scale data on the basis of the gender of teachers.
i) Pre-test vs Post-test scores of students of male teachers.
ii) Pre-test vs Post-test scores of students of female teachers.
iii) Post-test scores of students of male teachers vs students of female teachers.

1.4. Analysis of TPTT scale data on the basis of locality of the schools.
i) Pre-test vs Post-test scores of students of schools in rural areas.
ii) Pre-test vs Post-test scores of students of schools in urban areas.
iii) Post-test scores of students of schools in rural areas vs schools in urban areas.

1.5. Analysis of TPTT scale data on the basis of Teachers' Experience.
i) Pre-test vs Post-test scores of students of teachers having less than fifteen years of experience.
ii) Pre-test vs Post-test scores of students of teachers having more than fifteen years of experience.
iii) Post-test scores of students of teachers having less than fifteen years of experience vs those who had more than fifteen years of experience.
1.6. Analysis of TPTT scale data on the basis of number of in-service training programmes attended by the teachers.

i) Pre-test vs Post-test scores of students on their teachers' teaching who attended less than three in-service training programmes.

ii) Pre-test vs Post-test scores of students on their teachers' teaching who attended more than three in-service training programmes.

iii) Post-test scores of students on their teachers' teaching who attended less than three programmes vs those who attended more than three programmes.

1.7. Analysis of TPTT scale data on the basis of the nature of in-service training programmes attended by the teachers.

i) Pre-test vs Post-test scores of students on their teachers' teaching who attended in-service training programmes with follow-up activities.

ii) Pre-test vs Post-test scores of students on teachers' teaching who attended in-service training programmes without follow-up activities.

iii) Post-test scores of students on teachers who attended in-service programmes with follow-up activities vs those who attended in-service programmes without follow-up activities.
1.1. Analysis of pre-test and post-test Attitude Scores on TPTT scale in general:

A total of 1600 students were selected by using stratified random technique to investigate the teaching performance of the teachers before and after they attended the in-service training programmes. The mean opinion scores and the standard deviation of the students are tabulated in table 4.1.

Table 4.1

<table>
<thead>
<tr>
<th>Content</th>
<th>Post-test</th>
<th>Pre-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>126.40</td>
<td>123.12</td>
</tr>
<tr>
<td>SD</td>
<td>17.33</td>
<td>17.17</td>
</tr>
<tr>
<td>N</td>
<td>1600</td>
<td>1600</td>
</tr>
</tbody>
</table>

The mean opinion score of pre-test is 123.12 and the post-test is 126.40. The mean difference is 3.28. The 't' ratio 5.38 for a sample of 1600 is statistically significant at 0.01 level. Therefore, it can be interpreted that teachers attending in-service training programmes improves their performance in teaching and it influences a positive attitude among students with regard to the teaching performance of their teachers.
Therefore, the null hypothesis Ho: "There is no significant impact of the teachers' attending in-service training programmes on their teaching performance as perceived by their students" is rejected.
1.2. Analysis of TPTT Scale data on the basis of Types of Management of Schools:

The attitude scores of students towards the teaching performance of the teachers as the result of their attending in-service training programmes were analysed on the basis of the nature of schools where they were studying. The nature of school was classified as government schools and aided management schools. The pre-test and the post-test opinion scores as per the classification of nature of schools are tabulated in table 4.2.

Table 4.2

<table>
<thead>
<tr>
<th>Nature of School</th>
<th>Sample Size</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Schools</td>
<td>750</td>
<td>122.82</td>
<td>17.17</td>
<td>125.97</td>
<td>16.99</td>
</tr>
<tr>
<td>Aided Schools</td>
<td>850</td>
<td>123.38</td>
<td>17.17</td>
<td>126.78</td>
<td>17.63</td>
</tr>
</tbody>
</table>

The scores from table 4.2 reveal that the post-test scores are comparatively higher than that of pre-test scores. Statistical calculation using 't' test reveal that the mean...
difference of 3.15 between pre-test and post-test of government schools is statistically significant. The 't' value obtained is 3.57 which is greater than the table value 2.58 and found to be significant at 0.01 level. In the case of aided management schools too the 't' value calculated for the difference between means is 4.02 which is greater than the table value and found to be significant at 0.01 level. Therefore, the teachers attending in-service training programmes is certainly improving their teachers' performance as perceived by the students. While analysing the post-test scores of the government schools and the aided management schools, it was found that the difference between means is not statistically significant.

Therefore, the null hypothesis Ho2: "There is no significant impact of the types of management of schools on the teaching performance of the teachers', as perceived by their students, as a result of their attending in-service training programmes" is tenable.

It is inferred from the students attitude that the teachers working in government schools and the teachers working in aided management schools equally improve their teaching, after their attending the in-service training programmes.
The mean attitude scores of students on TPTT Scale on the basis of types of management of schools are graphically represented in figure 4.1:

**Figure 4.1**

Attitude Scores of Students on their Teachers' Teaching on the basis of Types of Management of Schools

---

127.0-
126.0-
125.0-
124.0-
123.0-
122.0-
121.0

- - - Aidec Schools

- - - Government Schools
1.3. Analysis of TPTT Scale data on the basis of the Gender of Teachers:

An investigation was attempted to find out whether male teachers show a better performance in teaching or female teachers perform better, after attending in-service training programmes, as perceived by the students. The pre-test and post-test scores are tabulated in table 4.3.

<table>
<thead>
<tr>
<th>Gender of Teacher</th>
<th>Sample Size</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Female</td>
<td>860</td>
<td>123.89</td>
<td>16.75</td>
</tr>
<tr>
<td>Male</td>
<td>740</td>
<td>122.23</td>
<td>17.61</td>
</tr>
</tbody>
</table>

While comparing the pre-test and the post-test opinion scores of students, it is found that both the male teachers and the female teachers improved their teaching efficiency. The 't' ratio of male teachers is 2.95 which is statistically significant at 0.01 level. The 't' ratio of female teachers is 4.60 which is also significant at 0.01 level. The difference between the post-test means of male
teachers and female teachers were analysed. The difference between means is 2.92. The 't' ratio is 3.40 which indicates the significant difference between means at 0.01 level. Hence, it is concluded that in-service training programmes contributed to a better performance on the teaching of female teachers than the teaching performance of male teachers. Female teachers tend to make better utilisation of in-service programme to improve their teaching.

Therefore, the null hypothesis Ho3: "There is no significant impact of gender of teachers on their teaching performance as a result of their attending in-service training programmes as perceived by the students" is rejected.
The mean attitude scores of students on TPTT Scale on the basis of the gender of teachers are graphically represented in figure 4.2:

**Figure 4.2**

Attitude Scores of Students on their Teachers' Teaching on the basis of the Gender of Teachers
1.4. Analysis of TPTT Scale data on the basis of Locality of the Schools:

Some research studies indicated that locality of the school plays a little role in the attitude of students towards the teaching performance of their teachers. The investigator wanted to examine whether the same trend could be noticed in his study also. The schools were classified into rural and urban schools and 88 teachers from rural schools and 72 teachers from urban schools attended the in-service programmes. 880 students who learnt under teachers from rural schools and 720 students learnt under the teachers from urban schools were selected for this investigation. The sample size, mean and the standard deviation for the pre-test and post-test scores are presented in the table 4.4.

### Table 4.4

**Attitude of Students on their Teachers' Teaching on the basis of Locality of the Schools**

<table>
<thead>
<tr>
<th>Locality of School</th>
<th>Sample Size</th>
<th>Pre-test</th>
<th></th>
<th>Post-test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Rural</td>
<td>880</td>
<td>123.20</td>
<td>16.77</td>
<td>125.66</td>
<td>17.41</td>
</tr>
<tr>
<td>Urban</td>
<td>720</td>
<td>123.02</td>
<td>17.66</td>
<td>125.08</td>
<td>17.25</td>
</tr>
</tbody>
</table>
The pre-test and the post-test opinion scores of each group (rural and urban) were analysed separately. The 't' ratio of these groups were found to be statistically significant at 0.01 level. Hence, it can be concluded that students have positive impression on the teaching efficiency of their teachers who attended the in-service training programmes. Post-test opinion scores of these groups were compared to find out attitude difference, if any. It was found that the mean difference is 0.58 and the 't' ratio is 0.67 which shows no significant difference between means. Hence, it is inferred that teachers attending in-service training programmes equally improved the teaching performance irrespective of the locality of the school.

Therefore, the null hypothesis Ho4: "There is no significant impact of locality of the schools on the teaching performance of the teachers", as a result of their attending in-service training programmes, as perceived by the students" is tenable.
The mean attitude scores of students on TPTT Scale on the basis of locality of the schools are graphically represented in figure 4.3:

Figure 4.3

Attitude Scores of Students on their Teachers' Teaching on the basis of Locality of the Schools

--- Rural

--- Urban

PRE-TEST

POST-TEST

159
1.5. Analysis of TPTT Scale data on the basis of the Teachers' Experience:

In any field, the experience of an individual is treated as an important variable for performance. So the investigator decided to study the impact of in-service training programmes on the basis of the teaching experience of the teachers. The teachers were classified into two groups (those having less than fifteen years of experience and more than fifteen years of experience) on the basis of their teaching experience. The attitude of their students were collected for this study. The mean scores, number of students and the standard deviation were tabulated in table 4.5.

<table>
<thead>
<tr>
<th>Experience of Teacher</th>
<th>Sample Size</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 15 years</td>
<td>670</td>
<td>122.98</td>
<td>17.10</td>
<td>125.85</td>
<td>17.63</td>
</tr>
<tr>
<td>More than 15 years</td>
<td>930</td>
<td>123.22</td>
<td>17.23</td>
<td>125.80</td>
<td>17.11</td>
</tr>
</tbody>
</table>

Table 4.5

Attitude of Students on their Teachers' Teaching on the basis of Teachers' Experience
The investigation revealed that the post-test scores are comparatively higher than that of the pre-test scores. Statistical analysis using 't' test reveals that the difference between the pre-test and the post-test mean attitude scores of the students studying under the teachers whose experience is less than fifteen years is 2.87 and the 't' ratio 3.02 is found to be significant at 0.01 level. In the case of students studying under the teachers whose experience is more than fifteen years too, the difference between the pre-test and the post-test attitude scores were found to be significant at 0.01 level. Therefore, it can be concluded that teachers' attending in-service training programmes improves their teaching efficiency irrespective of the teaching experience. While comparing the post-test attitude scores of the students studying under these two group of teachers, no significant difference could be noticed between means. Hence, the opinion of the students revealed that the gain derived from in-service training programmes by teachers between the groups is similar.

Therefore, the null hypothesis Ho: "There is no significant impact of the experience of the teachers' on their teaching performance as a result of their attending in-service training programmes as perceived by the students" is tenable.
The mean attitude scores of students on TPTT Scale on the basis of teachers' experience are graphically represented in figure 4.4:

Figure 4.4

Attitude Scores of Students on their Teachers' Teaching on the basis of Teachers' Experience
1.6. Analysis of TPTT Scale data on the basis of Number of In-service Training Programmes Attended by the Teachers:

In-service training programmes are organised under the assumption that they will contribute positively to the performance of those who attended. The investigator attempted to find out the impact of in-service training programmes on the basis of the number of programmes attended by the teachers. The teachers were classified into two types, i.e., teachers who attended more than three programmes and teachers who attended less than three programmes. The opinion scores of their students were collected and 't' values were calculated. The particulars are presented in Table 4.6.

Table 4.6

Attitude of Students on their Teachers' Teaching on the basis of Number of Programmes Attended by Teachers

<table>
<thead>
<tr>
<th>Number of Programmes Attended</th>
<th>Sample Size</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Less than Three</td>
<td>920</td>
<td>123.30</td>
<td>17.06</td>
</tr>
<tr>
<td>More than Three</td>
<td>680</td>
<td>122.88</td>
<td>17.32</td>
</tr>
</tbody>
</table>
The pre-test and the post-test attitude scores of the students of the above mentioned groups were analysed. A mean difference of 0.68 was noticed in the group of students who learnt under the teachers who attended less than three programmes. The 't' ratio 0.83 shows no significant difference between the means of the attitude scores. Hence, it can be inferred from the students opinion that teachers' attending less than three in-service training programmes did not have major impact on teaching efficiency of the teacher. But in the other case the 't' ratio 7.62 is greater than the table value 2.58 which shows a significant difference between means at 0.01 level. It is inferred that teachers attending more than three programmes significantly improved the teaching efficiency of the teacher. While comparing the post-test attitude scores of these two groups, a mean difference of 5.70 and the 't' ratio 6.74 could be noticed. This shows a significant difference between means at 0.01 level.

Therefore, the null hypothesis Ho6: "There is no significant impact of number in-service training programmes attended by teachers' on their teaching performance as perceived by the students" is rejected.
Hence, it can be deduced from the analysis that teachers attending more than three in-service programmes improved their teaching performance. Attending less than three programmes are not so effective in improving teaching. So, teachers should be encouraged to attend more and more programmes for their betterment in the field.
The mean attitude scores of students on TPTT Scale on the basis of number of in-service programmes attended by teachers are graphically represented in figure 4.5:

Figure 4.5

Attitude of Students on their Teachers' Teaching on the basis of Number of Programmes Attended by Teachers
1.7. Analysis of TPTT Scale data on the basis of the Nature of In-service Training Programmes Attended by the Teachers:

The nature of programmes were classified as, the programmes with follow-up activities and the programmes without follow-up activities. Majority of the in-service programmes are conducted without follow-up activities. So, an investigation was attempted to find out whether follow-up activity contribute to a better performance in teaching or not, as perceived by the students. The pre-test and the post-test scores are tabulated in table 4.7.

Table 4.7

Attitude of Students on their Teachers' Teaching
on the basis of the Nature of Programmes Attended by Teachers

<table>
<thead>
<tr>
<th>Nature of Programmes Attended</th>
<th>Sample Size</th>
<th>Pre-test Mean</th>
<th>SD</th>
<th>Post-test Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Follow-up Activity</td>
<td>300</td>
<td>123.03</td>
<td>17.12</td>
<td>131.25</td>
<td>15.19</td>
</tr>
<tr>
<td>Without Follow-up Activity</td>
<td>1300</td>
<td>123.14</td>
<td>17.19</td>
<td>125.28</td>
<td>17.60</td>
</tr>
</tbody>
</table>

The scores from table 4.7 reveal that, the post-test scores are comparatively higher than that of pre-test scores. Statistical calculations using 't' test reveal that the mean
difference of 8.22 between pre-test and post-test of programmes with follow-up activities is statistically significant at 0.01 level. In the case of programmes without follow-up activities also, the difference between means 2.14 and the 't' ratio 3.14 show a significant difference between means at 0.01 level. Hence, the analysis reveals that teachers' attending in-service programmes with follow-up activities and without follow-up activities certainly improve their teachers' efficiency as perceived by the students. While analysing the post-test scores of the above cited groups, it was found that the mean difference between them was found to be statistically significant at 0.01 level.

Therefore, the null hypothesis H₀: "There is no significant impact of the nature of in-service programmes attended by teachers' on their teaching performance as perceived by the students" is rejected.

Hence, it is inferred from the attitude scores of the students that teachers' attending in-service training programmes with follow-up activities is certainly improving their teaching efficiency than that of the teachers attending in-service training programmes without follow-up activities. It implied that the organisers may conduct more programmes with follow-up activities for the enhancement of the teaching efficiency of the teachers.
The mean attitude scores of students on TPTT Scale on the basis of the nature of in-service programmes attended by teachers are graphically represented in figure 4.6:

Figure 4.6

Attitude of Students on their Teachers' Teaching on the basis of the Nature of Programmes Attended by Teachers
Summary of Hypothesis Testing: Attitude Scores of Students

The results of the hypotheses testing made so far are tabulated below for ready reference.

<table>
<thead>
<tr>
<th>Hy. No.</th>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H01</td>
<td>Teachers' attending in-service training programmes and their teaching performance in general.</td>
<td>Significant at 0.01 level.</td>
</tr>
<tr>
<td>H02</td>
<td>Teachers' attending in-service training programmes and their teaching performance on the basis of types of management of schools.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>H03</td>
<td>Teachers' attending in-service training programmes and their teaching performance on the basis of the gender of teachers.</td>
<td>Significant at 0.01 level.</td>
</tr>
<tr>
<td>H04</td>
<td>Teachers' attending in-service training programmes and their teaching performance on the basis of locality of the schools.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>H05</td>
<td>Teachers' attending in-service training programmes and their teaching performance on the basis of teachers' experience.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>H06</td>
<td>Teachers' attending in-service training programmes and their teaching performance on the basis of number of programmes attended.</td>
<td>Significant at 0.01 level.</td>
</tr>
<tr>
<td>H07</td>
<td>Teachers' attending in-service training programmes and their teaching performance on the basis of nature of programmes attended.</td>
<td>Significant at 0.01 level.</td>
</tr>
</tbody>
</table>
Therefore, it can be inferred that teachers' attending in-service training programmes certainly has a positive impact on the performance of teachers as perceived by their students. Though the overall difference is significant, the gender, the number of programmes attended by them and the programmes with follow-up services have more impact on the teaching performance as perceived by the students than that of the other variables such as the nature of management, locality and experience of the teachers.

Section 1 dealt with the attitude scores of students on the performance of the teachers in the light of the independent variables. Similar analysis has been made in section 2 to study the nature of the attitude of teachers towards in-service training programmes. The same variables used in section 1 are used in section 2 too.
Section 2

Analysis of Teachers' Data on TAITP Scale

Though the main objective of this study is to investigate the effectiveness of in-service training programmes of teachers on the basis of achievement and attitudes of students, the investigator also wanted to study the teachers' attitude towards in-service programmes. So, the teachers' attitudes were collected by using TAITP scale and analysed on the basis of the independent variables. The analysis are as follows:

In this section, hypotheses Ho8 to Ho13 are tested. The scheme of analysis is as follows,

2.1. Analysis of TAITP scale data on the basis of types of management of schools.

2.2. Analysis of TAITP scale data on the basis of the gender of teachers.

2.3. Analysis of TAITP scale data on the basis of locality of the schools.

2.4. Analysis of TAITP scale data on the basis of Teachers' Experience.

2.5. Analysis of TAITP scale data on the basis of number of in-service training programmes attended by teachers.

2.6. Analysis of TAITP scale data on the basis of the nature of in-service programmes attended by teachers.
2.1. Analysis of TAITP Scale data on the basis of Types of Management of Schools:

In this investigation, the total sample of 160 teachers were classified under two groups such as teachers from government schools and teachers from aided management schools. An analysis was made to find out the teachers' attitudes on the basis of these two types. The mean attitude scores, sample under each category and the standard deviation are tabulated in table 4.8.

Table 4.8

Attitude of Teachers towards In-service Training Programmes on the basis of Types of Management of Schools

<table>
<thead>
<tr>
<th>Nature of Management</th>
<th>Sample Size</th>
<th>Mean of the Attitude Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>75</td>
<td>128.99</td>
<td>10.73</td>
</tr>
<tr>
<td>Aided Management</td>
<td>85</td>
<td>131.40</td>
<td>11.61</td>
</tr>
</tbody>
</table>

From the table 4.8, the mean difference between the attitude scores is found to be 2.41. The 't' ratio 1.37 shows no significant difference between means, because the calculated 't' value is less than the table value at 0.05 level.
Therefore, the null hypothesis $H_0\colon \text{"There is no significant difference between the attitude of teachers' towards in-service training programmes on the basis of types of management of schools"}$ is tenable.

It is inferred from the result that the teachers working in government schools and the teachers working in aided management schools have similar attitude towards in-service training programmes. So, it may be concluded that the management of school may not be a factor affecting the attitudes of teachers towards in-service training programmes.
2.2. Analysis of TAITP Scale data on the basis of the Gender of Teachers:

The investigator wanted to study the attitude of the teachers on the basis of the gender. The 't' test was used to find out the difference between the attitudes of the teachers. The calculated values are tabulated in table 4.9.

Table 4.9

Attitude of Teachers towards In-service Training Programmes on the basis of the Gender of Teachers

<table>
<thead>
<tr>
<th>Gender of Teachers</th>
<th>Sample Size</th>
<th>Mean of the Attitude Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>74</td>
<td>128.28</td>
<td>11.17</td>
</tr>
<tr>
<td>Female</td>
<td>86</td>
<td>131.98</td>
<td>11.07</td>
</tr>
</tbody>
</table>

While comparing the mean attitude scores of male and female teachers, a significant difference at 0.05 level could be noticed. The mean difference 3.70 and the 't' value 2.09 indicate a significant difference.
Therefore, the null hypothesis Ho9: "There is no significant difference between the attitude of teachers' towards in-service training programmes on the basis of the gender of teachers" is rejected.

The investigation reveals that, the female teachers have a better attitude towards in-service training programmes than that of male teachers.
2.3. Analysis of TAITP Scale data on the basis of Locality of the Schools:

The investigator wanted to find out whether or not the locality decides the attitude of teachers towards in-service training programmes. The 't' test was employed to analyse the scores of rural and urban teachers. The details of the analysis are given in the table 4.10.

Table 4.10

<table>
<thead>
<tr>
<th>Locality of Teachers</th>
<th>Sample Size</th>
<th>Mean of the Attitude Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>88</td>
<td>131.16</td>
<td>11.30</td>
</tr>
<tr>
<td>Urban</td>
<td>72</td>
<td>129.18</td>
<td>11.13</td>
</tr>
</tbody>
</table>

From the table 4.10, it is found that the mean attitude scores of rural teachers is higher than that of the urban teachers. The difference between these means is 1.98. The calculated 't' ratio 1.11 is lower than the table value. This shows that there is no statistically significant difference between these attitude scores.
Therefore, the null hypothesis H₀: "There is no significant difference between the attitude of teachers' towards in-service training programmes on the basis of locality of the schools" is tenable.

Hence it is inferred that the attitude of the rural teachers is not too different from that of urban teachers. By this result, it may be concluded that locality has no effect on the attitude of the teachers towards in-service training programmes.
2.4. Analysis of TAITP Scale data on the basis of Teachers' Experience:

An attempt was made to study the difference in the attitudes of teachers towards in-service training programmes on the basis of their teaching experience. Teachers who have less than fifteen years of experience were treated as one group and teachers who have more than fifteen years of experience were treated as another group. The calculated values are tabulated in table 4.11.

Table 4.11

Attitude of Teachers towards In-service Training Programmes on the basis of Teachers' Experience

<table>
<thead>
<tr>
<th>Experience of the Teacher</th>
<th>Sample Size</th>
<th>Mean of the Attitude Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 15 years</td>
<td>93</td>
<td>129.91</td>
<td>11.00</td>
</tr>
<tr>
<td>Less than 15 years</td>
<td>67</td>
<td>130.76</td>
<td>11.62</td>
</tr>
</tbody>
</table>

It is evident from the table 4.11 that the difference between attitude means is 0.85. The 't' ratio is 0.47 which shows no significant difference between means of the attitude scores.
Therefore, the null hypothesis H0: "There is no significant difference between the attitude of teachers' towards in-service training programmes on the basis of their experience" is tenable.

Hence, it is inferred from the result that teachers have similar attitudes towards in-service training programmes irrespective of their experience in teaching. It implied that the experience of the teacher has no effect on their attitudes towards in-service training programmes.
2.5. Analysis of TAITP Scale data on the basis of Number of In-service Training Programmes Attended by Teachers:

The researcher wanted to study whether or not the number of in-service programmes attended by the teachers affects the attitude of the teacher. In the total sample, 68 teachers attended more than three in-service programmes and 92 teachers attended less than three programmes. An analysis was made and 't' ratio was calculated between these two groups. The details are shown in the table 4.12.

Table 4.12

<table>
<thead>
<tr>
<th>No. of Programmes attended</th>
<th>Sample Size</th>
<th>Mean of the Attitude Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than Three</td>
<td>68</td>
<td>132.53</td>
<td>9.87</td>
</tr>
<tr>
<td>Less than Three</td>
<td>92</td>
<td>128.60</td>
<td>11.93</td>
</tr>
</tbody>
</table>

The difference between attitude means of the teachers who attended more than three programmes and less than three programmes was analysed. The difference between means 3.93 and the 't' ratio 2.28 could be noticed from the calculation. The calculated value is higher than the table value 1.96 which shows a significant difference between attitude means.
of teachers at 0.05 level. Hence, it is inferred that the teachers who attended more than three programmes have better attitude towards in-service training programmes than that of the teachers who attended less than three in-service training programmes.

Therefore, the null hypothesis Ho12: "There is no significant difference between the attitude of teachers' towards in-service training programmes on the basis of number of programmes attended by them" is rejected.
2.6. Analysis of TAITP Scale data on the basis of the Nature of In-service Training Programmes Attended by Teachers:

The researcher wanted to analyse the relationship between the nature of programmes conducted and the attitude of the teacher towards in-service training programmes. The nature is classified as programmes with follow-up activities and programmes without follow-up activities. 30 teachers among the total of 160 attended the programmes with follow-up activities. Students 't' test was employed to find out the difference between attitude means of the above cited groups. The values are tabulated in the table 4.13.

Table 4.13

<table>
<thead>
<tr>
<th>Nature of the Programme</th>
<th>Sample Size</th>
<th>Mean of the Attitude Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Follow-up</td>
<td>30</td>
<td>134.23</td>
<td>8.49</td>
</tr>
<tr>
<td>Without Follow-up</td>
<td>130</td>
<td>129.35</td>
<td>11.63</td>
</tr>
</tbody>
</table>

The table 4.13. shows that the attitude mean scores of the teachers who attended the programmes with follow-up activities is 134.23 and the teachers who attended the
programmes without follow-up activities is 129.35. The value 4.88 is noted as the difference between means and 2.63 is the calculated 't' ratio. This calculated 't' ratio is higher than the tabulated 't' value 2.58 and it shows a statistical significance at 0.01 level.

Therefore, the null hypothesis Ho13: "There is no significant difference between the attitude of teachers' towards in-service training programmes on the basis of the nature of programmes attended by them" is rejected.

The result of the above calculation revealed that teachers who attended the programmes with follow-up activities have better attitude towards in-service training programmes than that of the teachers who attended the programmes without follow-up activities.
Summary of Hypothesis Testing: Attitude Scores of Teachers

The results of the hypotheses testing made in this section are tabulated below for ready reference.

<table>
<thead>
<tr>
<th>Hy. No.</th>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho8</td>
<td>Teachers' attitude towards in-service training programmes on the basis of the types of management of schools.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho9</td>
<td>Teachers' attitude towards in-service training programmes on the basis of the gender of teachers.</td>
<td>Significant at 0.05 level.</td>
</tr>
<tr>
<td>Ho10</td>
<td>Teachers' attitude towards in-service training programmes on the basis of locality of the schools.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho11</td>
<td>Teachers' attitude towards in-service training programmes on the basis of teachers' experience.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho12</td>
<td>Teachers' attitude towards in-service training programmes on the basis of number of programmes attended.</td>
<td>Significant at 0.05 level.</td>
</tr>
<tr>
<td>Ho13</td>
<td>Teachers' attitude towards in-service training programmes on the basis of the nature of programmes attended.</td>
<td>Significant at 0.01 level.</td>
</tr>
</tbody>
</table>
In summary, teachers show a positive attitude towards in-service training programmes. The variables gender, number of programmes attended and nature of in-service programmes attended have more impact on the teachers' attitude than the other variables such as locality, type of management and experience of the teacher. The effects of the independent variables on the dependent variable in the case of TAITP scale is similar to that of TPTT scale.

Section 3 deals with the achievement of students analysed on the basis of independent variables used in section 1 and 2.
Section 3

Analysis of Students' Data on Achievement Scores

One of the main objectives of this study is to investigate the effectiveness of in-service training programmes on the achievement of the students. The knowledge gained by a learner is considered to be the end product in the field of education and it is measured in terms of digital codes called achievement scores or marks. To measure the impact of the in-service programmes, the researcher made an attempt to study the effectiveness through the students' achievement. Achievement of the students were analysed on the basis of the independent variables as cited in chapter III.

In this section, hypotheses H014 to H020 are tested. The scheme of analysis is as follows,

3.1. Analysis of pre-test and post-test achievement scores of students in general.

3.2. Analysis of achievement of students on the basis of types of management of schools.

i) Pre-test vs Post-test scores of students in government schools.

ii) Pre-test vs Post-test scores of students in aided management schools.

iii) Post-test scores of students in government schools vs aided management schools.
3.3. Analysis of achievement of students on the basis of the gender of teachers.
   i) Pre-test vs Post-test scores of students who learnt under male teachers.
   ii) Pre-test vs Post-test scores of students who learnt under female teachers.
   iii) Post-test scores of students learnt under male teachers vs learnt under female teachers.

3.4. Analysis of achievement of students on the basis of locality of the schools.
   i) Pre-test vs Post-test scores of students of schools in rural areas.
   ii) Pre-test vs Post-test scores of students of schools in urban areas.
   iii) Post-test scores of students of schools in rural areas vs schools in urban areas.

3.5. Analysis of achievement of students on the basis of Teachers' Experience.
   i) Pre-test vs Post-test scores of students of teachers having less than fifteen years of experience.
   ii) Pre-test vs Post-test scores of students of teachers having more than fifteen years of experience.
   iii) Post-test scores of students of teachers' whose experience is less than fifteen years vs teachers' who had more than fifteen years of experience.
3.6. Analysis of achievement of students on the basis of number of in-service training programmes attended by teachers.

i) Pre-test vs Post-test scores of students of teachers who attended less than three in-service programmes.

ii) Pre-test vs Post-test scores of students of teachers who attended more than three in-service programmes.

iii) Post-test scores of students of teachers who attended less than three programmes vs those who attended more than three programmes.

3.7. Analysis of achievement of students on the basis of the nature of in-service programmes attended by teachers.

i) Pre-test vs Post-test scores of students of teachers who attended in-service programmes with follow-up activities.

ii) Pre-test vs Post-test scores of students of teachers who attended in-service programmes without follow-up activities.

iii) Post-test scores of students of teachers who attended in-service programmes with follow-up activities vs those teachers who attended in-service programmes without follow-up activities.
3.1. Analysis of Achievement of Students in General:

The students who were administered the TFTT scale were also given the achievement tests. The achievement tests were administrated twice, i.e. one before and another one after the teachers' attending the in-service programmes. The students 't' procedure was employed to find out the difference between means. The details are shown in the table 4.14.

Table 4.14

Achievement of Students in General

<table>
<thead>
<tr>
<th>Content</th>
<th>Post-test</th>
<th>Pre-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>52.16</td>
<td>50.37</td>
</tr>
<tr>
<td>SD</td>
<td>17.35</td>
<td>16.30</td>
</tr>
<tr>
<td>N</td>
<td>1600</td>
<td>1600</td>
</tr>
</tbody>
</table>

Table 4.14 clearly indicates that students' achievement after teachers' attending in-service training programmes is higher than that of the pre-test scores. The difference between means is 1.79. The calculated 't' ratio is 3.00 which indicates a significant difference between means at 0.01 level. Hence, it can be inferred from the calculation that teachers attending in-service training programmes improves the students' achievement. This result indicates the need for taking necessary steps to extend in-service training programmes to all teachers.
Therefore, the null hypothesis $H_0$: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students" is rejected.
3.2. Analysis of Achievement of Students on the basis of Types of Management of Schools:

An investigation was made to find out the impact of in-service training programmes to teachers on the achievement of students before and after their teachers attending the training programmes on the basis of type of management. The students 't' test was employed for this analysis. The details are presented in the table 4.15.

Table 4.15

Achievement of Students on the basis of Types of Management of Schools

<table>
<thead>
<tr>
<th>Nature of School</th>
<th>Sample Size</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Government Schools</td>
<td>750</td>
<td>50.37</td>
<td>16.32</td>
</tr>
<tr>
<td>Aided Schools</td>
<td>850</td>
<td>50.38</td>
<td>16.28</td>
</tr>
</tbody>
</table>

While comparing the pre-test and the post-test scores of students of government schools, the difference between means 1.46 and the 't' value 1.70 indicate that there is no significant difference between mean achievement scores. Though the post-test mean score is higher than that of the
pre-test mean score, it is found that there is no significant difference between them. Hence, it may be concluded that students in government schools have the same level of achievement, after and before their teachers attending in-service training programmes. It implied that in-service training programmes attended by the teachers is not affecting the achievement of the students in government schools. In the case of aided management schools, the difference between means is 2.07. The calculated 't' value 2.52 is greater than that of table value 1.96 and it shows the significant difference at 0.05 level. It may be inferred that in-service training programmes to teachers significantly improved the achievement of students in aided schools. When comparing the post-test achievements of students in government schools and aided management schools, the difference between means 0.62 and the 't' value 0.72 could be noticed. This shows no significant difference between means. The insignificant mean difference of the post-test scores is mainly contributed by the lower mean difference between the pre-test and post-test scores in the case of government schools. The pre-test and post-test mean difference in the case of government schools was found to be 1.46 where as it was 2.07 in the case of management schools.
Therefore, the null hypothesis Ho15: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students on the basis of types of management of schools" is retained.

However, it is noteworthy that the mean difference between the pre-test and the post-test scores in the case of management schools is statistically significant, though the general comparison between the government schools and aided schools is found to be insignificant.
The mean achievement scores of students' on the basis of types of management of schools are graphically represented in figure 4.7:

**Figure 4.7**

Achievement of Students on the basis of Types of Management of Schools
3.3. Analysis of Achievement of Students on the basis of the Gender of Teachers:

The achievement scores of the students as the result of their teachers attending in-service training programmes were analysed on the basis of the gender of the teacher. A total of 860 students were selected from female teachers and 740 were selected from male teachers. The pre-test and the post-test mean achievement scores were analysed and tabulated in table 4.16.

Table 4.16

<table>
<thead>
<tr>
<th>Gender of Teacher</th>
<th>Sample Size</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Female</td>
<td>860</td>
<td>49.92</td>
<td>20.53</td>
</tr>
<tr>
<td>Male</td>
<td>740</td>
<td>50.90</td>
<td>9.17</td>
</tr>
</tbody>
</table>

The values from table 4.16 reveal that the post-test scores are comparatively higher than that of pre-test scores. Statistical calculation using 't' test revealed that the mean difference of 2.49 between pre-test and post-test of students studying under female teachers is statistically significant.
at 0.05 level. The 't' value obtained by calculation is 2.42 which is higher than the table value 1.96. In the case of male teachers too the calculated 't' value 2.04 shows a significant difference at 0.05 level. Hence, it can be deduced from the calculation that teachers attending in-service training programmes is certainly improving the achievement of their students irrespective of the gender of the teacher. While comparing the achievements of students after teachers' attending in-service training programmes, the 't' value 0.67 shows no significant difference between means.

Therefore, the null hypothesis Ho16: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students on the basis of the gender of teachers" is retained.

It implied that the students studying under male teachers as well as female teachers perform equally in their achievement after their teachers attending in-service training programmes.
The mean achievement scores of students' on the basis of the gender of teachers are graphically represented in the figure 4.8:

Figure 4.8

Achievement of Students on the basis of the Gender of Teachers

---

**Figure 4.8**

Achievement of Students on the basis of the Gender of Teachers

---

PRE-TEST

POST-TEST
3.4. Analysis of Achievement of Students on the basis of Locality of the Schools:

The pre and post test achievement scores of students on the basis of locality were analysed to find out the impact of teachers attending in-service training programmes on the achievement of students. The locality is classified as rural and urban. The students 't' test was employed to find out the difference between achievement means. The calculated values are tabulated in the table 4.17.

<table>
<thead>
<tr>
<th>Locality of School</th>
<th>Sample Size</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>880</td>
<td>49.82</td>
<td>15.87</td>
<td>52.11</td>
<td>16.55</td>
</tr>
<tr>
<td>Urban</td>
<td>720</td>
<td>51.05</td>
<td>16.78</td>
<td>52.21</td>
<td>18.28</td>
</tr>
</tbody>
</table>

The analysis on the achievement of students from urban schools reveals that the 't' value 1.26 shows no significant difference between achievement means. This implied that there is no marked difference in the achievement of urban students as a result of their teachers' attending in-service training
programmes. Hence, it is concluded that in-service training programmes attended by the teachers in urban schools makes no effect on the achievement of their students. But a mean gain 2.29 is noted in rural schools. The 't' ratio 2.97 is greater than the table value 2.58 which shows a significant difference at 0.01 level. It is concluded that students in rural schools significantly improved their achievement after their teachers attending in-service training programmes. The post-test scores of these two groups were analysed. The mean difference 0.10 shows no significant difference between means.

Therefore, the null hypothesis Ho17: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students on the basis of locality of the schools" is tenable.

It can be interpreted from the analysis that, after teachers attending in-service training programmes, the achievement of students studying in urban as well as rural schools are improving, though a statistical significance could be noticed in the case of rural students. It reflects the same result as that of the opinion of the students on the basis of locality.
The mean achievement scores of students on the basis of the locality of the schools are graphically represented in figure 4.9:

Figure 4.9

Achievement of Students on the basis of Locality of the Schools

--- Rural
--- Urban
3.5. Analysis of Achievement of Students on the basis of Teachers' Experience:

The researcher wanted to study the impact of in-service training programmes to teachers on the achievement of students on the basis of the experience of the teachers who attended the in-service programmes. The selected sample was classified as students studying under the teachers who had less than fifteen years of experience and teachers who had more than fifteen years of experience. The achievement scores of students before and after their teachers attending in-service training programmes were analysed by employing the student's *t* test. The values are presented in the following table.

<table>
<thead>
<tr>
<th>Experience of Teacher</th>
<th>Sample Size</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 15 years</td>
<td>670</td>
<td>49.21</td>
<td>16.94</td>
<td>51.16</td>
<td>18.07</td>
</tr>
<tr>
<td>More than 15 years</td>
<td>930</td>
<td>51.21</td>
<td>15.76</td>
<td>52.88</td>
<td>16.77</td>
</tr>
</tbody>
</table>

While comparing the pre-test and post-test scores of the student, in the group where the teachers' experience is less than fifteen years, the mean difference L.95 and the
calculated 't' value 2.03 could be noticed. This shows a significant difference between means at 0.05 level. Hence, it can be deduced that after teachers attending in-service training programmes the achievement of their students increased significantly. The same trend is also noticed in the case of the teachers whose experience is more than fifteen years. This implied that teachers attending in-service training programmes improved the achievement of the students irrespective of the teaching experience of the teacher. Another differential study was also employed to study the impact between the post-test scores of the above mentioned groups. Though the mean difference obtained is 1.72, the 't' value 1.93 is not statistically significant.

Therefore, the null hypothesis H₀: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students on the basis of the teaching experience of the teachers" is retained.

The investigation implied that the achievement of students is equal irrespective of the experience of the teachers who attended the in-service training programmes. In both the cases the improvement in achievement is similar. The same result was noticed in the student opinion scores also.
The mean achievement scores of students' on the basis of teachers' experience are graphically represented in figure 4.10:

Figure 4.10

Achievement of Students on the basis of Teachers' Experience
3.6. Analysis of Achievement of Students on the basis of Number of In-service Training Programmes Attended by Teachers:

The investigator classified the sample into two types namely, students learnt under the teachers who attended more than three programmes and students learnt under teachers who attended less than three programmes. The differential study was employed to find out the relationship between these two groups on the basis of their achievement. The details of the analysis are presented in the table 4.19.

Table 4.19

Achievement of Students on the basis of Number of Programmes Attended by Teachers

<table>
<thead>
<tr>
<th>Number of Programmes Attended</th>
<th>Sample Size</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Less than Three</td>
<td>920</td>
<td>49.69</td>
<td>14.75</td>
</tr>
<tr>
<td>More than Three</td>
<td>680</td>
<td>51.30</td>
<td>18.14</td>
</tr>
</tbody>
</table>

A groupwise analysis was made on pre-test and post-test scores separately. The statistical analysis using 't' test revealed that the difference between achievement scores of students studying under the teachers who attended more than
three programmes is 3.22 and the calculated *t* ratio 3.22 is found to be significant at 0.01 level. In the case of students studying under the teachers who attended less than three programmes, the difference between pre-test and the post test achievement is 0.72 and the *t* ratio 1.01 indicates no significant difference between mean achievements. These above cited results can be interpreted that the teachers attending more than three programmes significantly improved the achievement of their students and the teachers attending less than three programmes did not have significant effect on the achievement of their students. The post-test scores were analysed. The difference between means is 4.11. The calculated *t* value is 4.60 which is higher than the table value 2.58 and indicates a statistical significance at 0.01 level.

Therefore, the null hypothesis H019: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students on the basis of number of programmes attended by the teachers" is rejected.

It is inferred from the analysis that teachers attending more than three in-service training programmes certainly improved the achievement of the students who learnt under them.
The mean achievement scores of students' on the basis of number of in-service training programmes attended by teachers are graphically represented in figure 4.11:

Figure 4.11

Achievement of Students on the basis of Number of Programmes Attended by Teachers
3.7. Analysis of Achievement of Students on the basis of the Nature of In-service Training Programmes Attended by Teachers:

The researcher wanted to study the achievement of the students on the basis of the nature of programmes attended by the teachers. The nature of programmes were classified as, the programmes with follow-up activities and the programmes without follow-up activities. 300 students were selected from the teachers who attended programmes with follow-up activities and 1300 students were from the another category. The data for calculation of 't' value were tabulated as follows,

Table 4.20

Achievement of Students on the basis of the Nature of programmes Attended by Teachers

<table>
<thead>
<tr>
<th>Nature of Programmes Attended</th>
<th>Sample Size</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Follow-up Activity</td>
<td>300</td>
<td>51.10</td>
<td>20.01</td>
<td>55.75</td>
<td>20.27</td>
</tr>
<tr>
<td>Without Follow-up Activity</td>
<td>1300</td>
<td>50.20</td>
<td>15.31</td>
<td>51.33</td>
<td>16.49</td>
</tr>
</tbody>
</table>

The values from the table 4.20 reveal that, the post-test scores are higher than that of the corresponding pre-test scores. Statistical calculations using 't' test revealed
that the mean difference of 4.65 between pre-test and post-test of programmes with follow-up activities is statistically significant at 0.01 level. In the case of programmes without follow-up activities, the difference between means 1.13 and the 't' ratio 1.80 indicates no significant difference between means. Hence, it is interpreted from the analysis that teachers attending in-service training programmes with follow-up activities certainly improved the achievement of the students, where as teachers attending in-service training programmes without follow-up activities did not make a significant effect on the achievement of students. The difference between the post-test means of these two groups were analysed. The difference between means is 4.42. The 't' ratio is 3.52 which indicates the significant difference of means at 0.01 level. Hence, it is concluded that in-service training programmes contributed to a better achievement of the students who learnt under the teachers who attended programmes with follow-up activities than that of the students who learnt under the teachers who attended programmes with out follow-up activities.

Therefore, the null hypothesis $H_{020}$: "There is no significant impact of the teachers' attending in-service training programmes on the achievement of their students on the basis of the nature of programmes attended by the teachers" is rejected.
The mean achievement scores of students' on the basis of the nature of in-service training programmes attended by teachers are graphically represented in figure 4.12:

Figure 4.12

Achievement of Students on the basis of the Nature of programmes Attended by Teachers

---

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Summary of Hypothesis Testing: Achievement Scores of Students

The results of the hypotheses testing made in section 3 are presented below for ready reference.

<table>
<thead>
<tr>
<th>Hy. No.</th>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho14</td>
<td>Teachers' attending in-service training programmes and the achievement of their students in general.</td>
<td>Significant at 0.01 level.</td>
</tr>
<tr>
<td>Ho15</td>
<td>Teachers' attending in-service training programmes and the achievement of their students on the basis of types of management of schools.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho16</td>
<td>Teachers' attending in-service training programmes and the achievement of their students on the basis of the gender of teachers.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho17</td>
<td>Teachers' attending in-service training programmes and the achievement of their students on the basis of locality of the schools.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho18</td>
<td>Teachers' attending in-service training programmes and the achievement of their students on the basis of teachers' experience.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Ho19</td>
<td>Teachers' attending in-service training programmes and the achievement of their students on the basis of number of programmes attended.</td>
<td>Significant at 0.01 level.</td>
</tr>
<tr>
<td>Ho20</td>
<td>Teachers' attending in-service training programmes and the achievement of their students on the basis of nature of programmes attended.</td>
<td>Significant at 0.01 level.</td>
</tr>
</tbody>
</table>
Hence, it can be concluded that teachers' attending in-service training programmes contribute to a positive improvement on the achievement of their students. Though the overall difference is significant, the number of programmes attended by the teacher and the nature of the programmes attended by the teacher have more impact on the achievement of the students than that of the variables the gender, type of management, locality and the experience of the teacher.

Section 4 deals with the relationship between the students' achievement and the opinion scores collected through TPTT scale.
Section 4

Correlational Study between Students' Achievement and their Attitude Scores

The researcher wanted to find out the relationship between the students' achievement and the opinion scores of the students on their teachers teaching. Pearson's coefficient of correlation technique was adopted to find the 'r' value. In this section, hypothesis Ho21 is tested.

Correlational Study:

A correlational study between the achievement scores and the attitude scores of students was done for the total sample. For calculating the correlation coefficient, the investigator used only the post-test scores of students' achievement and their attitude. The calculated coefficient of correlation 0.616 indicates a highly positive correlation between these two scores.

Therefore, the null hypothesis Ho21: "There is no significant correlation between the achievement of students and the attitude of students towards the teaching performance of their teachers" is rejected.
Hence, it can be concluded that students who have better attitude on the teaching of their teachers, performed higher in their achievement and vice versa. The result, "there is a close relationship between the attitudes of the students on their teachers' teaching and the achievement", has more implications in the classroom teaching-learning process.

The analyses made in chapter IV, clearly revealed the impact of in-service training programmes on the student achievement as well as their attitudes. Besides the data collected from students and teachers, the investigator also interviewed thirty heads of institutes to find out their opinion about the quality of in-service training programmes as measured through the students' achievement and attitude. The investigator used unstructured interview procedure to gather the views of the heads of institutes. The responses of the heads are classified under two categories, namely,

a) importance of in-service training programmes.
b) performance of teachers as a result of in-service training programmes.

The responses are summarised as follows:
a) Importance of In-service Training Programmes:

1. In-service programmes are the bridge between the innovations and the end-users (teachers). So, it must be strengthened.

2. Each teacher must undergo a minimum of two in-service training programmes in every academic year to know the latest methods of teaching and innovations in the field of education.

3. It was suggested that career advancement in schools may also be linked to the number of in-service training programmes attended by teachers similar to those requirements prescribed in the case of college teachers.

4. One educational officer may be appointed to promote in-service training programmes in each district.

5. Every in-service training programme should have follow-up activities which are very minimum in the present programmes.

6. In-service training programmes should be extended to all teachers. More emphasis may be given for workshops, orientations courses, seminars and discussions geared towards methods of teaching, learning styles, etc.

7. School based in-service training programmes and follow-up activities may yield better results.
b) Performance of the Teachers as a result of In-service Training Programmes:

8. After attending in-service training programmes, it was observed that teachers are using a variety of teaching techniques which are more helpful for students to learn the concept clearly and thoroughly.

9. Students in their classes show much interest in learning.

10. Teachers use different techniques to improve the performance of slow-learners and also give different activities for gifted.

11. Teachers encourage the students to ask more doubts regarding the concept taught and they explain the matters clearly by using different aids.

12. Apart from teaching subject, teachers also participated in some co-curricular activities.

13. In-service training programmes made them to read more books and participate in discussions which are related to their subjects.

14. The performance of the students are better than before.

15. Sometime teachers prepare and use improvised aids for teaching which make the classroom instruction interesting.

16. A few teachers attempted to do action researches as a result of their attending in-service programmes.
In short, teachers who attended in-service training programmes aim at optimum efforts to teach better. The observations made by the heads of institutions indicate that in-service training programmes contribute to better teaching, thereby creating a conducive atmosphere for the teaching-learning process. The appreciation of the heads of institutes about their teachers' involvement in teaching as a result of in-service training programmes, is very significant and it can go a long way in improving the relationship between fellow teachers and heads of institutes.

The analyses made in chapter IV from the points of view of students, teachers and heads of institutes revealed the effectiveness of in-service training programmes in the educational scenario. The salient findings and recommendation emerged out of this study are summarised in chapter V.