

CHAPTER FOUR

Analysis and Interpretation

4.0.0 INTRODUCTION:

After discussing the uses of Alternative Instructional Material (AIM) and taking a brief review of researches conducted in this area to support the rationale of the present study, detailed plan of the study was presented in the third chapter. The hypotheses to be tested, variable involved, sample selected, tools employed and the manner in which the relevant data was collected and other methodological details are discussed in that chapter. The data thus collected was subjected to appropriate statistical procedure to test the hypotheses with which this study was initiated. The details of the statistical techniques employed for analysis of the data, results obtained through this analysis and the decisions regarding the rejection or non rejection of hypotheses are presented in this chapter.

Statistical techniques are used for organizing, analyzing, and interpreting numerical data. Statistics is a basic tool of measurement and evaluation, when research has quantifiable data. Statistical method goes to the fundamental purposes of description and analysis. By statistic we can analyze and interpret the data and can draw conclusions. If the collective data are systematically arranged, and analyzed through appropriate scientific and statistical technique, the results obtained are scientific and correct.

Interpretation of data refers to that important part of the investigation, which is associated with the drawing of the inference from the collected facts after an analytical study. It is the interpretation that makes it possible for us to utilize collected data in various fields.

According to the hypothesis of the study the data collected were analyzed on the basis of score of the pre test and post test .The statistical method serves the fundamental purpose of description and analysis, and their proper application involves answering the following questions:

1. What facts need to be gathered to provide the information necessary to answer to test the hypothesis?
2. How are these data to be gathered, organized, and analyzed?
3. What assumptions underlie the statistical methodology to be employed?
4. What conclusions can be validly drawn from the analysis of the data?

4.1.0 STATISTICAL PROCEDURE EMPLOYED:

First, to understand the distribution of variables, basic statistics such as Mean and Standard Deviation were calculated for all the variables involved in the study. For the total sample, as well as the sub group of the sample based on gender, locale and Intelligence level were compared. 't' value for independent and co-related sample were calculated.

4.2.0 ANALYSIS OF THE HYPOTHESES:

4.2.1 ANALYSIS PERTAINING TO TOTAL SAMPLE:

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V students.

Table 4.1 showing the significant means difference between pre test and post test scores of the total students.

No.	Test	No. of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	95	30.61	10.5	94	0.88	10.13	Significant
2	Post test	95	35.88	8.65				

The table shows that the computed value of the 't' test is **10.13** and the table value of 't' test is **2.63** at 0.01 level.

✓ Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their post test achievement in comparison to pre test.

The value of mean for post test (A.M. = **35.88**) is found to be greater than pre test (A.M. = **30.61**) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of total students of class V at significant level.

4.2.2 ANALYSIS PERTAINING TO GENDER:

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V boys.

Table 4.2 showing the significant means difference between pre test and post test scores of the boys.

No.	Test	No. of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	57	30.4	10.4	56	0.84	6.85	Significant
2	Post test	57	35.6	8.6				

The table shows that the computed value of the 't' test is 6.85 and the table value of 't' test is 2.65 at 0.01 level

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their post test achievement in comparison to pre test.

The value of mean for post test (A.M. = 30.4) is found to be greater than pre test (A.M. = 35.6) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of boys of class V at significant level.

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V girls.

Table 4.3 showing the significant means difference between pre test and post test scores of the girls.

No.	Test	No. of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	38	30.9	10.9	37	0.88	6.45	Significant
2	Post test	38	36.4	9.2				

The table shows that the computed value of the 't' test is 6.45 and the table value of 't' test is 2.71 at 0.01 level

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their posttest achievement in comparison to pre test.

The value of mean for post test (A.M. =30.9) is found to be greater than pre test (A.M. = 36.4) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of girls of class V at significant level.

There will not be significant difference of effectiveness of Alternative-Instructional Material(AIM) on arithmetic achievement of class V boys and girls.

In order to test the hypothesis difference between pre test and post test has been computed separately for boys and girls. This difference indicates improvement obtained due to Alternative Instructional Material (AIM). Significance of difference of means has been arrived by computing 't' value, to know whether gender variance are evident. For this purpose the difference between pre test and post test has been taken as a score. The results on verification of hypothesis have been presented in following table.

Table 4.4 showing the significant means difference between the score difference of boys and girls .

No.	Variables	No. of students	Mean	S.D.	df	t- value	Significance
1	Boys	57	5.14	2.3	93	0.135	Significant
2	Girls	38	6.02	2.08			

The table shows that the computed value of the't' test is 0.135 and the table value of 't test is 2.63 at 0.01 levels

Thus, the computed value of 't' is less than table value. Hence the hypothesis is accepted.

It shows that boys and girls of experiment group do not differ significantly from each other in arithmetic achievement. From this it may be inferred that Alternative Instructional Material (AIM) has no differential effect on boys and girls in respect of their achievement.

INTERPRETATION:

Table 4.2 , 4.3 and 4.4 inform us following basic facts

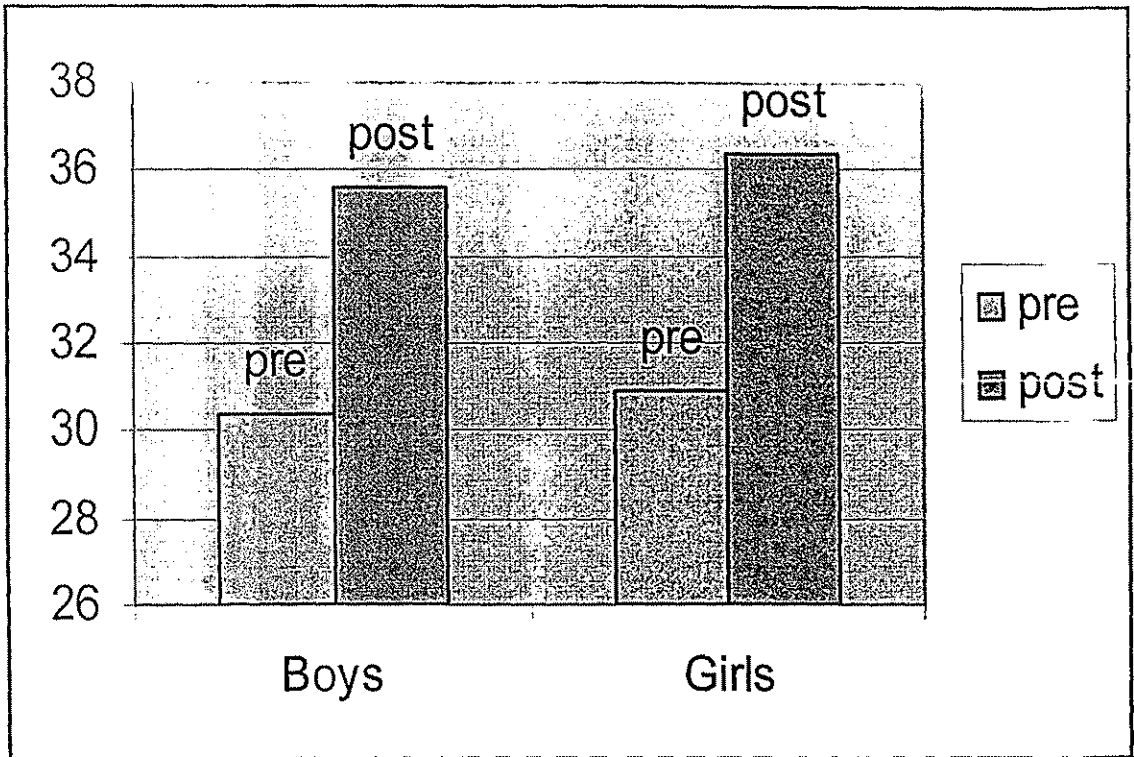
Firstly, in pre test and post tests boys and girls' achievement is similar.

Secondly, Alternative Instructional Material (AIM) has shown positive effect on both, boys and girls. In the both the cases post test scores are significantly higher than the scores of pre tests.

On the whole results pertaining to gender reveals that the Alternative Instructional Material (AIM) has helped both boys and girls in improving their arithmetic achievement but there is no difference between boys and girls regarding intensity of improvement. This means that improving on arithmetic achievement among boys and girls is similar, the Alternative Instructional Material (AIM) has helped both alike. From this evident Alternative Instructional Material (AIM) can be used for all the students, irrespective of their gender in improving the achievement.

By looking at pre test and post test scores of both , it can be deduced that , due to the intervention of Alternative Instructional Material (AIM) , performance levels in both the cases improved significantly but not gap that existed between boys and girls' arithmetic achievement.

Graph 1



Graphical Representation Of Pre and Post Test Mean Value of Boys and Girls

4.2.3 ANALYSIS PERTAINING TO LOCALE :

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V urban students.

Table 4.5 showing the significance means difference between pre test and post test scores of the urban students.

No.	Test	No. of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	52	32.98	11.05	51	0.89	6.375	Significant
2	Post test	52	37.57	9.165				

The table shows that the computed value of the 't' test is **6.375** and the table value of 't' test is **2.68** at 0.01 level.

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their posttest achievement in comparison to pre test.

The value of mean for post test (A.M. = **32.98**) is found to be greater than pre test (A.M. = **37.57**) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of urban students of class V at significant level.

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V rural students.

Table 4.6 showing the significance means difference between pre test and post test scores of the rural students.

No.	Test	No. of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	43	27.75	9.0	42	0.88	9.16	Significant
2	Post test	43	33.8	7.5				

The table shows that the computed value of the 't' test is 9.16 and the table value of 't' test is 2.71 at 0.01 level.

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their posttest achievement in comparison to pre test.

The value of mean for post test (A.M. = 27.75) is found to be greater than pre test (A.M. = 33.8) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of rural students of class V at significant level.

There will not be significant difference of effectiveness of Alternative-Instructional Material(AIM) on arithmetic achievement of class V urban and rural students.

In order to test the hypothesis difference between pre test and post test has been computed separately for Urban and Rural students. This difference indicates improvement obtained due to Alternative Instructional Material (AIM). Significance of difference of means has been arrived by computing 't' value, to know whether locale variance are evident. For this purpose the difference between pre test and post test has been taken as a score. The result on verification of hypothesis has been presented in following table.

Table 4.7 showing the significance means difference between the score difference of urban and rural students.

No.	Variables	No. of students	Mean	S.D.	df	t- value	Significance
1	Urban	52	4.56	2.28	93	3.24	Significant
2	Rural	43	6.02	2.08			

The table shows that the computed value of the 't' test is 3.24 and the table value of 't' test is 2.63 at 0.01 level

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is rejected.

It shows that urban and rural students of experiment group do differ significantly from each other in arithmetic achievement. From this it may be implied that Alternative Instructional Material (AIM) has differential effect on urban and rural students in respect of their achievement

INTERPRETATION:

Table 4.5 , 4.6 and 4.7 inform us following basic facts:

Firstly, At both , pre test and post tests urban students achievement is better than rural students.

Secondly, Alternative Instructional Material (AIM) has shown positive effect on both, rural and urban students. In the both the cases post test scores are significantly higher than the scores of pre tests.

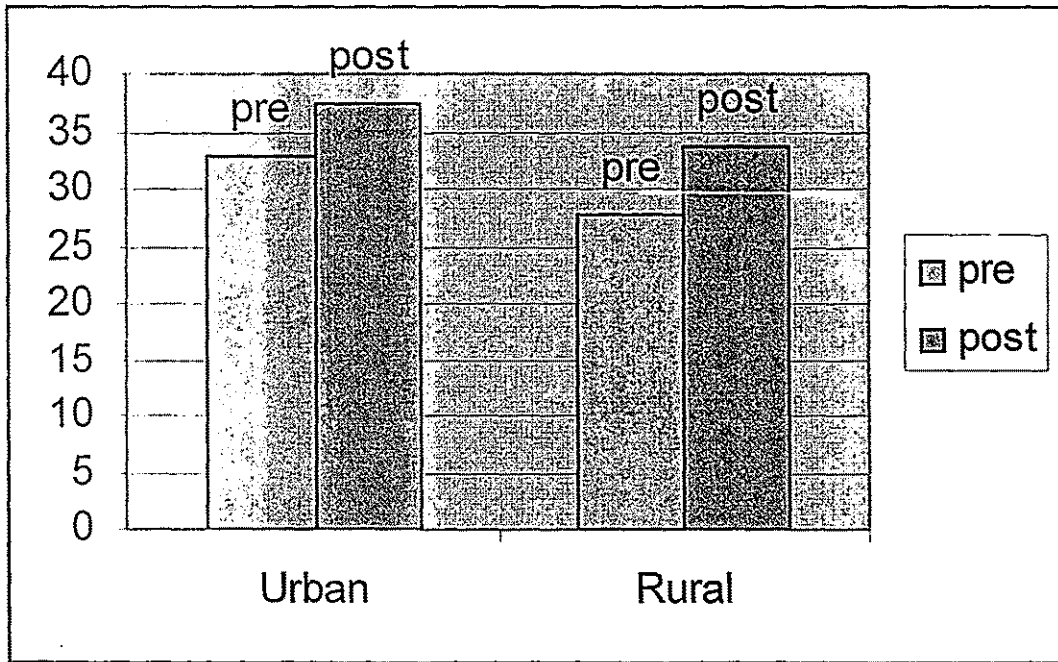
Thirdly, The difference in the effect of Alternative Instructional Material (AIM) on both rural and urban student's arithmetic achievement varied significantly.

Though Alternative Instructional Material (AIM) intervention has shown significant effect on arithmetic effect of both, the ' Intensity of Improvement ' of rural students due to the intervention of Alternative Instructional Material (AIM) is significantly bettered than that of urban students.

By looking at pre test and post test scores of both , it can be deduced that , due to the intervention of Alternative Instructional Material (AIM) , performance levels in both the cases not improved only improved significantly but also gap that existed between urban and rural student's arithmetic achievement has been relatively reduced.

This shows that, the Alternative Instructional Material (AIM) is more beneficial to rural students. The Alternative Instructional Material (AIM) developed without any locale specificity, but has yielded more learning gains arithmetic among rural students. Of course , this variation in learning achievement may be verified in future research as probing into reasons is beyond the scope of present study

GRAPH 2



Graphical Representation Of Pre and Post Test Mean Value of Urban and Rural students.

4.2.4 ANALYSIS PERTAINING OF INTELLIGENCE LEVEL:

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V below average intelligence level students.

Table 4.8 showing the significance means difference between pre test and post test scores of the below average intelligence level students.

No.	Test	No. of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	31	18.5	3.05	30	0.72	16.15	Significant
2	Post test	31	24.8	2.37				

The table shows that the computed value of the 't' test is **16.15** and the table value of 't test is **2.75** at 0.01 level

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their posttest achievement in comparison to pre test.

The value of mean for post test (A.M. =**18.5**) is found to be greater than pre test (A.M. = **24.8**) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of below average intelligence level students of class V at significant level.

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V above average intelligence level students.

Table 4.9 showing the significance means difference between pre test and post test scores of the above average intelligence level students.

No.	Test	No. Of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	27	43.9	3.1	26	0.80	7.2	Significant
2	Post test	27	46.5	2.8				

The table shows that the computed value of the 't' test is 7.2 and the table value of 't test is 2.78 at 0.01 level.

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their posttest achievement in comparison to pre test.

The value of mean for post test (A.M. = 43.9) is found to be greater than pre test (A.M. = 46.5) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of above average intelligence level students of class V at significant level.

There will be significant effect of Alternative Instructional Material (AIM) on arithmetic achievement of class V average intelligence level students.

Table 4.10 showing the significance means difference between pre test and post test scores of the average intelligence level students.

No.	Test	No. Of students	Mean	S.D.	df	Co-relation 'r'	t- value	Significance
1	Pre test	37	31.2	4.14	36	0.62	13.75	Significant
2	Post test	37	36.7	3.7				

The table shows that the computed value of the 't' test is 13.75 and the table value of 't' test is 2.72 at 0.01 level

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is accepted. It indicates that the students of experimental group do differ in their post test achievement in comparison to pre test.

The value of mean for post test (A.M. = 31.2) is found to be greater than pre test (A.M. = 36.7) as mean difference is significant, it may be inferred that Alternative Instructional Material (AIM) improves arithmetic achievement of average intelligence level students of class V at significant level.

There will not be significant difference of effectiveness of alternative-instructional material on arithmetic achievement of class V different Intelligence level students.

In order to test the hypothesis difference between pre test and post test has been computed separately for below average and average Intelligence students. This difference indicates improvement attained due to Alternative Instructional Material (AIM). Significance of difference of means has been arrived by computing 't' value, to know whether Intelligence level variance is evident. For this purpose the difference between pre test and post test has been taken as a score. The results on verification of hypothesis have been presented in following table.

Table 4.11 showing the significance means difference between below and average I.Q. students test scores.

No.	Variables	No. Of students	Mean	S.D.	df	t- value	Significance
1	Below Average	31	6.70	1.62	66	2.92	Significant
2	Average	37	5.62	1.48			

The table shows that the computed value of the 't' test is 2.92 and the table value of 't test is 2.65 at 0.01 level

Thus, the computed value of 't' is greater than table value. Hence the hypothesis is rejected.

It shows that below and average Intelligence students of experiment group do differ significantly from each other in arithmetic achievement. From this it may be implied that Alternative Instructional Material (AIM) has differential effect on below-average and average Intelligence students in respect of their achievement

In order to test the hypothesis difference between pre test and post test has been computed separately for average and above average Intelligence students. This difference indicates improvement attend due to Alternative Instructional Material (AIM). Significance of difference of means has been arrived by computing 't' value, to know whether Intelligence level variance are evident. For this purpose the difference between pre test and post test has been taken as a score. The results on verification of hypothesis has been presented in following table.

Table 4.12 showing the significance means difference between average and above average Intelligence students test scores.

No.	Variables	No. Of students	Mean	S.D.	df	t- value	Significance
1	Average	37	5.62	1.48	62	2.27	Not Significant
2	Above Average	27	3.51	4.67			

The table shows that the computed value of the 't' test is 2.27 and the table value of 't test is 2.65 at 0.01 level

Thus, the computed value of 't' is less than table value. Hence the hypothesis is not rejected.

It shows that average and above average Intelligence students of experiment group do not differ significantly from each other in arithmetic achievement. From this it may be implied that Alternative Instructional Material (AIM) has not

differential effect on average and above average Intelligence students in respect of their achievement

In order to test the hypothesis difference between pre test and post test has been computed separately for above average and below students. This difference indicates improvement attend due to Alternative Instructional Material (AIM). Significance of difference of means has been arrived by computing 't' value, to know whether Intelligence level variance is evident. For this purpose the difference between pre test and post test has been taken as a score. The result on verification of hypothesis has been presented in following table.

Table 4.13 showing the significance means difference between below average and above average Intelligence students test scores .

No.	Variables	No. Of students	Mean	S.D.	df	t- value	Significance
1	Below Average	31	6.70	1.62	56	3.39	Significant
2	Above average	27	3.51	4.67			

The table shows that the computed value of the 't' test is **3.39** and the table value of 't test is **2.65** at 0.01 level

Thus, the computed value of 't' is greater than table value, and hence the hypothesis is rejected.

It shows that below average and above average Intelligence students of experiment group do differ significantly from each other in arithmetic achievement. From this it may be implied that Alternative Instructional Material (AIM) has differential effect on below average and above average Intelligence students in respect of their achievement

INTERPRETATION

In a nutshell, the results pertaining to Intelligence levels reveals that students belonging to different Intelligence levels have improve their arithmetic achievement due to Alternative Instructional Material (AIM) . However the intensity of

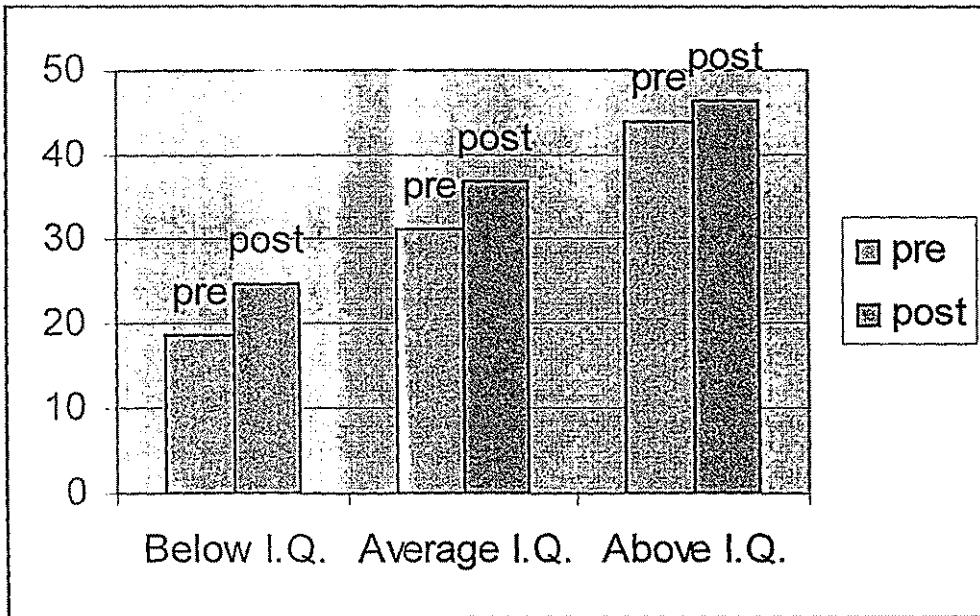
improvement in varying in below average and average Intelligence students. Below Intelligence students having improved more compare to average Intelligence students in their arithmetic achievement

The intensity of improvement in varying in average and above average Intelligence students. Average Intelligence students having improved more compare to above average Intelligence students in their arithmetic achievement but not at significant level

The intensity of improvement in varying in above average and below average Intelligence students. Below average Intelligence students having improved more compare to above average Intelligence students in their arithmetic achievement.

This means that Alternative Instructional Material (AIM) come through improved arithmetic achievement among students of different Intelligence level.. It is more beneficial to below average Intelligence students. The Alternative Instructional Material (AIM) developed without any Intelligence specificity, but has yielded more learning gains arithmetic among below average Intelligence students. Of course, this variation in learning achievement may be verified in future research as probing into reasons is beyond the scope of present study

GRAPH 3



Graphical Representation Of Pre and Post Test Mean Value of Different level of Intelligence Students.