CHAPTER V

ANALYSIS AND INTERPRETATION OF DATA

5.0.0 Introduction

This chapter presents analysis of data collected during the summative evaluation and results thereof. The main purpose of this chapter is to show the analytical picture of the effect verbal creativity instructional materials produced on students having varied characteristics. The data have been quantitatively as well as qualitatively analysed. The variables of the study are (i) independent variable, i.e.,verbal creativity instructional materials, (ii) dependent variable,i.e.,creativity scores of the children as evidenced by the gains from pre-test to post-test, (iii) the secondary independent variables, i.e. sex, levels of creative potential, levels of socio-economic status and rural-urban backgrounds. The data regarding the variables mentioned above have been quantitatively analysed, along with correlational data and creativity rating scale data. The reaction questionnaire data and the interview data have been qualitatively analysed.

5.0.1 Preliminary Considerations

After the administration of the Passi test of Creativity, the creativity scores of urban schools and rural schools were compared in terms of means and standard deviations.

Table 5.1 : Showing the Means and Standard Deviations of Pre-test Creativity Scores of Four Schools

	Name of the School	N	Mean	S.D.
Urban	Experimental School 1	46	69.1	38.32
	Control School 2	39	37.15	21.69
Roral	Experimental School 3	37	19.89	16.52
	Control School 4	27	31	22.04

Note : School : 1 = M.E.S.Higher Primary School
School : 2 = Vijaya Middle School
School : 3 = G.M.Primary School, Kaggalipura
School : 4 = G.M.Primary School, Byramangala

The above table (5.1) reveals the non-equivalence of urban schools and rural schools. One to one pairing of the students was impossible, as the schools were different, faf off, having different number of students, etc. In the case of urban schools, the experimental school is having the higher mean, and in the case of rural schools, the control school is having the higher mean.

After the post-test, the investigator used 't' test for correlated means, to find out the significance of difference between means of post-test and pre-test. The use of 't' test, vis-a-vis normality of the distributions have been discussed in a subsequent section. (Vide 5.1.1.)

Table 5.2 : Showing the Results of 't' Test for Correlated Means.

School	N	Post-mean	Pre-mean	't'	Significance
School 1	46	93.7	69.1	3.63	S(P < .01)
School 2	39	48.85	37.15	3.91	S(P < .01)
School 3	37	41.11	19.89	5.56	S(P < .01)
School 4	27	43.07	31	2.62	S(P < .05)

Note : School 1 = M.E.S.Higher Primary School
School 2 = Vijaya Middle School
School 3 = G.M.Primary School, Kaggalipura
School 4 = G.M.Primary School, Byramangala

As all the schools have done significantly better in the post-test, the comparison of experimental and control schools does not reveal much. To know whether the experimental groups have done well over the control groups, taking into consideration pre-test scores also, simple analysis of covariance (one treatment variable) was run, which helped in statistical control of the groups.

Table 5.3 : Showing the Analysis of Covariance of Experimental and Control Students Creativity Test Performance in Urban and Rural Areas

Source of Variation	Degrees of freedom	Sum of squares	Mean squares	F
Urban				
Between	1	4785.01	4785.01	4.13*
Within	82	94947.1	1157.89	
Total	83	99732.11		
Rural				
Between	1	1193.42	1193.42	2.17
Within	61	33563.99	550.23	
Total	62	34757.41		

* Significant at 0.05 level

The data shows that children in the experimental schools did better than the control groups. The urban experimental group did significantly better at 0.05 level, but the rural experimental school could not significantly gain over the control school.

It can be inferred that when covariance analysis was used to equate statistically the groups, according to the 'Passi tests of Creativity, the verbal creativity instructional materials produced significant result in case of urban experimental group, but not in case of rural experimental group,

which means even the test-sensitization effect has been surpassed by the urban experimental group. Test-sensitization is the facility of answering the because of the familiarity of the test, if used again. In the present study same tests were used during pre-test to post-test.

The possible reason for rural experimental group children not reaching the level of significance could be that the rural control children were initially superior to rural experimental school children, as their creativity scores indicate. The rural experimental children had to reach the level of rural control children first and then make superior gains to reach the level of significance.

The post-test scores and pre-test scores of experimental schools on Passi tests of Creativity were tabulated, keeping the sex, rural-urban background, levels of creative potential and levels of socio-economic status as variables. The reasons for giving importance to experimental schools in the present study were : (i) in a developmental study like the present one, the emphasis will be mainly on the effectiveness of instructional materials on various groups, viz., high SES group, low creative group,etc.; (ii) as the control groups were not administered the verbal creativity

instructional materials, these variables would serve hardly any purpose, from the point of view of present study; and (iii) as the experimental and control schools were also nonequivalent initially, with respect to creativity scores, these variables were not considered in case of control group.

When all the four variables, viz., sex, levels of creative potential, levels of socio-economic status and rural-urban backgrounds were taken at a time, a 2 X 2 X 3 X 3 table emerged with respect to experimental schools' creativity test data. But the number of students in some cells were very low and some cells were empty. As any plausible inference from such small samples would be highly questionable, it was decided to restrict the hypotheses to those with one and two variables only. If the size of the sample had been very large, say 300, the number in each cell would have increased and the significance tests could have been applied, but in the present investigation, the size of sample was 83.

In analysing the data, the following sequence has been adhered to.

(A) Creativity test data, having the pre-test and post-test scores of the students of all the four schools, two being experimental and two being control. The

control schools data have been utilised in section For testing the hypotheses the data of experimental children have been considered.

(B) Correlational data, of comprehension test scores and pre-test creativity scores of experimental schools' children.

(C) Creativity rating scale data, of the experimental schools' children, who got ratings before and after the experiment, by their teachers.

(D) Reaction questionnaire data, of experimental school's children who completed parts of the reaction questionnaire, after every two chapters were over.

(E) Interview data of students, viz., high gainers and low gainers, who were interviewed by the investigator.

(F) Interview data of parents, viz., the parents of high gainers and low gainers, who were also interviewed by the investigator.

The quantitative analysis in case of A, B, and C was done by the investigator using a desk calculator. Even though percentages were calculated in case of D, more of qualitative analysis was done. Purely qualitative analysis was taken recourse to, in case of E and F.

5.1.0 Creativity Test Data

(A) The process of data collection in the experimental schools for validation study was described in the last chapter. The quantitative data so collected were subjected

to the techniques of descriptive and inferential statistics for the purpose of analysis.

5.1.1 Discussion of Distributions

The pre-test and post-test scores of experimental schools, on the Passi tests of Creativity were descriptively analysed. The Mean, Standard Deviation, Skewness and Kurtosis were computed. These are given in the following table.

Table 5.4 : Showing the Descriptive Statistics of the Experimental Schools together

Type of Statistics (N=83)	Pre-test	Post-test
Mean	47.17	70.25
Standard Deviation	39.17	47.65
Skewness	0.7	0.78
Kurtosis	0.298	0.299

A scrutiny of the distributions reveal that both are positively skewed and both are platy-kurtic, because, by definition, if kurtosis is greater than 0.263, then the distribution is platy kurtic.

The skewness and standard deviation seem to be appreciably large. Standard deviation gets affected by range, as the creativity tests demand responses of divergent nature,

and so the distributions are quite likely to be affected by largeness of range.

The ratios of the total range to the standard deviation were calculated. They were 4.2 and 5.2 for the first distribution and second distribution respectively. A comparison of these values with interpolated values given in Guilford (1965), viz., 5.3 and 5.6 (approx.) revealed that the first distribution differs appreciably from the table value. As a precaution, 'goodness of fit' test was run using chi-square. The first distribution's difference with the normal distribution was significant at 0.05 level. The second distribution's difference with the normal distribution was not significant, that is, the second distribution was more near to normalcy. This result gave a clue to the investigator in taking caution to use parametric 't' tests for inference.

The discussion of the distribution led to an examination of assumptions of both parametric and non-parametric tests. Siegel (1956) succinctly puts that non-parametric tests assumptions are fewer and much weaker than those associated with parametric tests. They do not require measurement so strong as that required for the parametric tests.

But Guilford (1965) cautions that before an investigator resorts to nonparametric tests, he should examine whether any of the more powerful tests could be used. Some of the distribution free or non-parametric methods have lower power to detect a real difference as significant. When there is a choice, therefore, one should prefer a parametric test, except where a quick, rough test will do.

Guilford (1965) continuing the argument says that some empirical evidences have been gathered to show that 'slight' deviations in meeting the assumptions underlying parametric tests may not have 'radical' effects on the obtained probability figure. There is as yet no general agreement as to what constitutes a'slight' deviation.

The investigations of Boneau (1960) have clarified the above stand to a greater extent. He has investigated by means of sampling from non-normal distributions, with unequal variances of samples, and with differing N's, the effects of conditions such as these, which violate the assumptions of the 't' test, upon rejections of hypotheses at the 0.05 and 0.01 levels. On the whole, 't' test is not markedly affected by rather strong violations, unless N is very small.

The discussion of distributions and the pros and cons of parametric and non-parametric tests led the investigator to go in for both the types of significance testing techniques. The N being large becomes a common factor for both parametric and non-parametric tests to be effective tests. Therefore, itmwas decided to run parametric and non-parametric tests of all subgroups distributions with N = 8 and above and others were omitted (except in hypothesis 2 (b), page no. 171.).

5.1.2 Students 't' Test and Wilcoxon 'T' Test

't' test and 'T' test have been mostly used tests to find the significance of difference between two correlated means. In the present study these tests have been used to find the significance of difference of means of creativity scores of pre-test and post-test, as well as the pre-rating and post-rating of students on creativity rating scale.

't' test and 'Mann-Whitney U' test have been mostly used to find the significance of difference between means of independent means. In the present study these tests have been used to find the significance of difference between means of creativity test scores of post-test in case of two groups.

Analysis of Covariance has been used in case of finding the significance of difference between means of Boys and girls, taking into consideration their pre-test creativity scores.

Out of the ten hypotheses, the first four have been stated directly in terms of four variables, viz., levels of creative potential, levels of socio-economic status, rural-urban backgrounds and sex. These would be analysed at two levels. (i) Between post-test and pre-test scores, and (ii) among the post-test scores of different groups. The reason for analysing these hypotheses at two levels is that these variables are secondary independent variables and therefore their effect has to be considered from both the angles. The next six hypotheses are interactional in nature. If only sex is taken, it may not show the influence of instructional materials properly, but when taken together with levels of socio-economic status, one would get a better picture of types of interactional effect. These six interactions would be analysed with post-test and pre-test scores only. It would be difficult to analyse the effectiveness among the post-test scores, as the size of the samples differ and sometimes does not provide a clear picture at all. Throughout the analysis, the 'effect' has been measured in terms of gains in the Passi tests of Creativity scores.

5.1.2.1 Hypothesis No.1 : There will be no significant difference in the effect of verbal creativity instructional materials on the students of different creative potentials.

The investigator employed 't' test for related measures and Wilcoxon 'T' to find the significance of difference between means of post-test and pre-test.

Table 5.5 : Showing the 't' and 'T' Test Results of Different Creative Potential Groups (Post Test Vs Pre Test)

Type	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
High C.P group	22	95.14	85.27	1.12	N.S.	0	N.S.
Middle C.P.group	42	70.17	41.19	5.69	S(P < .01)	61.5	S(P < .01)
Low C.P. group	19	41.63	15.74	5.08	S(P < .01)	3	S(P < .01)

The values of Student 't' or Wilcoxon 'T'/Z obtained call for rejection of null hypotheses in case of middle creative potential group and low creative potential group. In case of high creative potential group the null hypothesis is not rejected.

This means, the students of middle creative potential and low creative potential did significantly better in the

post-test compared to the pre-test. The high creative potential students could not do significantly well.

The reasons for the above finding could be that verbal creativity instructional materials were more in favour of middle and low creative potential students than the high creative potential students, or the high creative students being already high on the score level might have found it difficult to go still higher. Another technical reason could be that of statistical regression (Vide Chapter VI section 6.5.0).

(b) In the second stage, 't' test with facility to estimate the 't' values for different degrees of freedom, when $n_1 \neq n_2$ (Edwards, 1954), and Mann-Whitney U test were used to find the significance of difference between post-test scores of different groups. (Z was computed from U). When N is large, Z is calculated out of U which is approximately normally distributed with zero mean and unit variance. (Siegel, 1956).

Table 5.6 : Showing 't' and 'U' Test Results of Three Groups taken two at a Time (Post-test Scores only)

Type	N	Mean	Student 't'	Significance	Mann-Whitney Z	Significance
High C.P.	22	95.14	2.17	S(P < .05)	2.39	S(P < .01)
Middle C.P.	42	70.17				
Middle C.P.	42	70.17	2.79	S(P < .01)	1.74	S(P < .05)
Low C.P.	19	41.63				
Low C.P.	19	41.63	5.33	S(P < .01)	4.25	S(P < .01)
High C.P.	22	95.14				

The values of 't' and 'Z' call for rejection of Null hypotheses in all the three cases.

The high creative potential group differs significantly from middle creative potential group, which differs significantly from low creative potential group and that in turn differs significantly from high creative potential group. It means that all the three groups differ significantly from each other. In other words, the high creative potential students have done better than middle creative potential students who in turn have done better than the low creative potential students. This means that verbal creativity instructional materials have produced differential effects on different creative potential students. Again, this indicates that each one of these groups was able to enhance its creative

thinking abilities according to its capabilities and that too in a clearcut manner.

5 6.1.2.2 Hypothesis No. 2 : There will be no significant difference in the effect of verbal creativity instructional materials on the students of different socio-economic statuses.

(a) The investigator employed 't' test for related measures and Wilcoxon 'T' test to find the significance of difference between means of post-test and pre-test.

Table 5.7 : Table showing 't' and 'T' Test Results of Different Socio-economic Groups (Post-test Vs Pre-test)

Type	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
High SES	27	82.37	59.93	2.33	S(P< .05)	78	S(P < .01)
Middle SES	50	61.05	39.54	5.1	S(P < .01)	160	S(P < .01)

(Tests were not run for low SES group because of its size being 6).

The values of 't' and 'T' call for rejection of Null hypotheses in both the cases, i.e., high SES students and middle SES students. Both the groups of students, whether they belong to high or middle socio-economic statuses, have done significantly well in the post-test compared to the pre-test. Middle SES students seems to have done well than the other

group in terms of significance.

(b) In the second stage 't' test with facility to estimate the 't' values for different degrees of freedom when $n_1 \neq n_2$, and Mann-Whitney U test were used to find the significance of difference between means of post-test scores of different groups (Z was computed from U).

Table 5.8 : Showing the 't' and 'U' Test Results of Three Groups, taken two at a Time (Post-test Scores only)

Type of Group	N	Mean	Student t	Significance	Mann-Whitney Z	Significance
High SES	27	82.37	1.67	N.S.	0.015	N.S.
Middle SES	50	61.04				
Middle SES	50	61.04	2.02	N.S.	0.052	N.S.
Low SES	6	92.5				
Low SES	6	92.5	0.55	N.S.	0.039	N.S.
High SES	27	82.37				

The nonsignificance in all the three cases led the investigator not to reject the Null hypotheses.

This means that high SES group does not differ significantly with middle SES group, which does not differ significantly with low SES group, which in turn does not differ significantly high SES group. That is, the students have benefitted equally well from verbal creativity instructional materials irrespective of their high, middle or low socio-economic

statuses. This may be due to verbal creative instructional materials being unbiased towards any one of the socio-economic statuses groups.

A comparison of this result with the second part of hypothesis 1, gives an interesting finding that the students do not differ in gains because of their levels of socio-economic status, but do differ with respect to their initial creative potential levels. This speaks of the merit of verbal creativity instructional materials being ability based than SES based.

5.1.2.3 Hypothesis No. 3 : There will be no significant difference in the effect of verbal creativity instructional materials on the students of rural-urban backgrounds.

To test the hypothesis, 't' test for finding significance of difference between the two correlated means, and the Wilcoxon test (T) were applied.

Table 5.9 : Showing 't' and 'T' Test Results of Rural and Urban Schools (Post-test Vs Pre-test)

Type of Students	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
Urban	46	93.7	69.1	3.63	S(P < .01)	199	S(P < .01)
Rural	37	41.11	19.89	5.56	S(P < .01)	53	S(P < .01)

The obtained 't' and 'T' values show the significance at 0.01 level and so the Null hypotheses were rejected.

This means that the rural and urban children have done significantly better in the post-test when compared to the pre-test. A point of importance has been that the gains obtained by both the groups are nearly equal. Even though the rural children are handicapped in many respects, like, lack of good facilities in schools, insufficient library books, inability to buy books other than text, etc., they have done equally well like urban children.

The rural children could go up equally with urban children, if suitable opportunities are provided to them, even though they were at a lower level initially. This finding throws light on the unbiased nature of the verbal creativity instructional materials towards either the urban group or the rural group.

(b) 't' test for finding the significance of difference between two independent means and Mann-Whitney U test were applied for post-test scores only (Z was computed from U).

Table 5.10 : Showing 't' and 'U' Test Results of Rural and Urban Groups (Post-Test only)

Type of Students	N	Mean	Student t	Significance	Mann-Whitney Z	Significance
Urban	46	93.7	6.27	S(P < .01)	5.43	S(P < .01)
Rural	37	41.11				

The significance of the 't' and 'Z' values led the investigator to reject the Null hypothesis.

The urban children have done significantly better than the rural children in their creativity scores after the treatment was over. This may be because of the initial superiority of urban children, i.e., to say, the non-equivalence of the two groups in the beginning of the treatment. The initial superiority may be due to the opportunities for learning the urban children get at home, in the school, etc., and generally the educationally conscious parents in urban area try to develop their abilities by different means or educational atmosphere in the home itself, could be one of the factors. This again adds to the point made in the second part of analysis of hypothesis two, that the verbal creativity instructional materials are ability based, that is, the urban children with their initial high creativity score have maintained significant difference, after the treatment also.

5.1.2.4 Hypothesis No. 4 : There will be no significant difference in the effect of verbal creativity instructional materials on male and female students.

(a) The investigator employed 't' test for finding the significance of difference between two correlated means and Wilcoxon test (T) to analyse the hypothesis.

Table 5.11 : Showing 't' and 'T' Test Results of Males and Females (Post-Test Vs Pre-Test)

Type	N	Post-mean	Pre-mean	Student 't'	Signi-fiance	Wilcoxon T	Signifi-cance
Males	44	72.89	41.71	4.84	S(P<.01)	102	S(P<.01)
Females	39	67.28	53.33	3.1	S(P<.01)	147.5	S(P<.01)

As the 't' and 'T' values reached the level of significance, Null hypotheses had to be rejected.

This means both boys and girls have done significantly better in the post-test when compared to the pre-test. That is, the verbal creativity instructional materials were able to enhance the creative abilities of both and girls significantly.

(b) A comparison of the pre-test means and post-test means of boys and girls revealed that boys had gained more than the girls. The boys who were at a lower level have superceeded girls in the post-test. The girls, on the other hand, even though they were superior at the pre-test time could not maintain that superiority, which casted a doubt. Therefore, analysis of covariance was run to adjust the effect of pre-test scores.

Table 5.12 : Showing Analysis of Covariance of Boys's and Girls's Creativity Test Performance

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F
Between	1	5987.98	5987.98	24.97*
Within	80	19778.4366	239.73	
Total	81	25166.4146		

* Significant at 0.01 level

The Null hypothesis that there is no significant difference in the effect of instructional materials on males and females was rejected., as the F ratio was significant at 0.01 level. That is, the boys were found to excel girls significantly.

In the Indian social set up, many studies have found that boys do better than girls in creativity tests (Prakash, 1966), (Raina, 1966), (Raina, 1969) and (Passi, 1971). Even in creativity fostering studies, they have done well, seems to be an extension of the findings of others. In Indian society, the boys are given more freedom, whereas, the girls are more protected by parents. More than the abilities, it is the social setting that can explain such findings.

5.1.2.5 Hypothesis No.5 : The effect of the verbal creativity instructional materials will not be significant on the students of different creative potentials with regard to their different socio-economic statuses.

	H.C.P.	M.C.P.	L.C.P	
H.SES	8	11	8	27
M.SES	11	29	10	50
L.SES	3*	2*	1*	6
	22	42	19	83

Note: Statistical tests were not run for the Cells marked *, as they were below 8.

The hypothesis was tested using the 't' test for related measures and Wilcoxon test (T) between post-test and pre-test means.

Table 5.13 : Showing the Significance of Difference Between Means of SES X CP Interactions (Post-test Vs Pre-test)

Type	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
HSES with HCP	8	107.5	108.75	0.06	N.S.	16	N.S.
HSES with MCP	11	92.73	56.18	2.02	N.S.	7.5	S(P< .05)
HSES with LCP	8	43	16.25	2.298	N.S.	3	S(P< .05)
MSES with HCP	11	86	75.09	0.93	N.S.	40	N.S.
MSES with MCP	29	58.45	33.59	4.45	S(P <.01)	24.5	S(P< .01)
MSES with LCP	10	40.7	16.7	7.06	S(P < .01)	0	S(P< .01)

The 't' and 'T' values in case of last two hypotheses call for rejection of Null hypotheses. The parametric test is to be preferred to a non-parametric test under comparable situations because it is more powerful and robust and so the first four Null hypotheses are not to be rejected. In testing of further hypotheses if such variation occurs, this logic will stand.

The students belonging to middle socio-economic status with middle creative potential and middle socio-economic status with low creative potential have done significantly better in the post-test compared to the pre-test whereas, high socio-economic status students of all levels of creative potential and middle socio-economic status students with high creative potential have not done significantly better in the post-test compared to the pre-test.

The possible reason could be that high SES students might not get positive reinforcements for their creative ideas, innovations, etc., in the family, it may also be that the parents are otherwise engaged in their own work. As all the children were treated in the same manner without the knowledge of their antecedents or initial creative potential, only the family could provide the answer.

The middle SES students except those having high creative potential have done significantly well. Answer

again could be found in the family. The middle socio-economic status group generally suffers from 'status consciousness'. Only the achievement of children could bring them up and not the family position. Therefore, it is natural that the middle socio-economic status parents try hard to recognize the salient points in their children's personality and reinforce them, especially in urban areas.

Out of the six top gainers, who were interviewed, 3 belonged to the middle socio-economic status group, two to high SES group and one to low socio-economic status group.

The observations made above regarding the middle socio-economic status group was very well observed in the interviews with them.

Considering all this the investigator can infer that only two of the middle socio-economic status and creative potential interactions were significant but not others.

5.1.2.6 Hypothesis No. 6 : The effect of the verbal creativity instructional materials will not be significant on the students of different creative potentials with regard to their rural-urban backgrounds.

	HCP	MCP	LCP	
Urban	12	23	11	46
Rural	10	19	8	37
	22	42	19	83

't' test for correlated means and Wilcoxon test (T) were run to find the significance of difference between post-test and pre-test.

Table 5.14 : Showing the Significance of Difference Between Means of (CP X Rural-Urban) Interactions (Post-test Vs Pre-test)

Type of Students	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Signifiaance
Urban HCP	12	1ν.67	120.25	0.94	N.S.	28	N.S.
Urban MCP	23	103.96	63.65	3.898	S(P< .01)	18	S(P < .01)
Urban LCP	11	53.73	24.73	3.55	S(P< .01)	1	S(P< .01)
Rural HCP	10	76.5	43.3	2.88	S(P < .05)	5	S(P < .05)
Rural MCP	19	29.47	14	4.85	S(P < .01)	6	S(P < .01)
Rural LCP	8	25	3.38	4.88	S(P< .01)	1	S(P < .05)

The significance of 't' and 'T' values directed the investigator to reject the Null hypotheses in all the cases except in the case of urban high creative potential group.

All the types of students of urban or rural area with different creative potentials have done significantly better in the post-test compared to the pre-test, except the urban high creative potential group, whose less score in post-test

may be traced to 'statistical regression'.

This finding supports the earlier inference, that all students irrespective of their being in rural or urban area could do significant progress because of the input or it may also mean that the students' abilities are more important than the place of residence, in making significant gains because of the programme.

The break up of the 6 top gainers supports the above finding. Out of the 3 urban top gainers two belonged to the middle creative group, one to the low creative group and none to the high creative group. All the three rural top gainers belonged to high creative potential group, which means the ability of the children has mattered much in the rural area, but not in urban area, where there may be other factors influencing the same like the social ones discussed earlier.

It may be said at this stage that five out of six interactions of levels of creative potential and rural-urban backgrounds were found significant which speak of the merit of verbal creativity instructional materials being unbiased towards any one of the groups.

5.1.2.7 Hypothesis No. 7 : There will be no significant effect of verbal creativity instructional materials on male and female students of different creative potentials.

	HCP	MCP	LCP	
Male	12	23	9	44
Female	10	19	10	39
	22	42	19	83

The investigator employed 't' test for correlated means and Wilcoxon test (T), to find the significance of difference between means of post-test and pre-test.

Table 5.15 : Showing the Significance of Difference Between Means of (Sex X CP) Interactions (Post-test Vs Pre-test)

Type	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
HC Males	12	84.33	69.58	1.28	N.S.	23	N.S.
MC Males	23	78.09	37.57	4.14	S(P < .01)	3	S(P < .01)
LC Males	9	44.33	14	3.25	S(P < .05)	1	S(P < .01)
HC Females	10	108.1	104.1	0.29	N.S.	0	N.S.
MC Females	19	60.58	45.58	2.97	S(P < .01)	25.5	S(P < .01)
LC Females	10	39.2	17.3	4.4	S(P < .01)	1	S(P < .01)

The significance of values of t and T resulted in the rejection of Null hypotheses in all the cases except that of high creative males and high creative females, where Null hypotheses were not rejected.

The males of middle and low creative potential and females of middle and low creative potential were found to gain

significantly. But the males or females of high creative potential could not gain significantly in the post-test over the pre-test.

This finding is an extension and further confirmation of the finding on levels of creative potential of hypothesis 1. The students of high creative potential of both sexes have made significant progress in the training. It may be said that both boys and girls of high creative potential are responsible for not attaining the level of significance.

This may also be said that the verbal creativity instructional materials are more biased towards middle and low creative potential groups, than the high creative potential group or the earlier interpretation of 'Statistical Regression' holds good here for both boys and girls.

Four out of the six interactions of sex and levels of creative potential were found to be significant, which again speaks of the ability based nature of the instructional materials.

5.1.2.8 Hypothesis No. 6 : The effect of verbal creativity instructional materials will not be significant on the students of different socio-economic statuses having rural-urban backgrounds.

	HSES	MSES	LSES	
Urban	20	23	3*	46
Rural	7*	27	3*	37
	27	50	6	83

Note : Statistical tests were not run for the Cells marked * , as they were below 8.

This hypothesis was analysed using the 't' test for related measures and Wilcoxon test (T) between post-test and pre-test means.

Table 5.16 : Showing the Significance of Difference Between Means of (SES X Rural-Urban) Interactions. (Post-test Vs Pre-test)

Type of Students	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
Urban HSES	20	101.35	75.35	2.03	N.S.	47.5	S(P < .05)
Urban MSES	23	84.35	61.96	2.91	S(P < .01)	46.5	S(P < .01)
Rural MSES	27	41.19	20.07	4.57	S(P < .01)	27	S(P < .01)

The significance values in case of urban MSES students and rural MSES students led the investigator to reject the Null hypotheses. The special case of urban high SES students having high 't' which is slightly less for the significance by 0.06, and Wilcoxon T having reached the significance level, the Null hypothesis could be rejected.

This means, the high SES students and middle SES students of urban area and middle SES students of rural area have done

significantly well in the post-test when compared to the pre-test.

It has been observed that in all these discussions that middle SES students have done consistently well, which was discussed in the interpretation of hypothesis No. 5. The results of high SES students with respect to hypotheses No.5 and 8 raises an important question, do high SES parents have an anticreative attitude ? or it may be the provision of high status in rural area, because of the family, by others, which may go anticreative. The achievement for the high status students does not become a necessary and sufficient condition to thrive in life, like the middle socio-economic status students.

Three of the interactions of rural-urban background and levels of socio-economic statuses were found significant, which speaks of the merit of instructional materials in terms of relevant variables, producing equally good gains in those students.

5.1.2.9 Hypothesis No. 9 : There will be no significant effect of verbal creativity instructional materials on male and female students of different socio-economic statuses.

	HSES	MSES	LSES	
Male	12	28	4*	44
Female	15	22	2*	39
	27	50	6	83

Note : Statistical tests were not run for Cells marked *, because they were less than 8

The hypothesis was analysed by using 't' test for related measures and Wilcoxon test (T) to find the significance of difference between means of post-test and pre-test.

Table 5.17 : Showing the Significance of Difference Between Means of (SEX X SES) interactions. (Post-test Vs Pre-test)

Types	N	Post-mean	Pre-mean	Student 't'	Significance	Wilcoxon T	Significance
HSES Males	12	94	51.08	2.38	S(P< .05)	9	S(P< .05)
MSES Males	28	59.36	35.82	3.81	S(P<.01)	48	S(P<.01)
HSES Females	15	73.07	67	0.75	N.S.	36	N.S.
MSES Females	22	62.73	43.82	3.44	S(P<.01)	31.5	S(P<.01)

The significance of 't' and 'T' values necessitated the rejection of Null hypotheses in three cases. In case of females of high SES, the Null hypothesis could not be rejected.

The high SES and middle SES males and middle SES females have done significantly well in the post-test when compared to the pre-test. The females of high socio-economic status group have not done well in terms of creativity test gains.

The high socio-economic status group has been the point of discussion. It may be that females of high SES group more

than the males, who suffer from excess of parental supervision and provision of less freedom in the family or the high socio-economic status girls do not have the achievement motivation, to achieve and get a status among the peer group members, as they are already being looked up in appreciation by others for their possessions. Less of unsupervised practise helps in the enhancement of creative abilities, which may not be found in the high SES families. May be, the high SES parents want their daughters to achieve better in tests and examinations than in other types of activities, thus encouraging convergent thinking to conserve the family traditions and societal norms.

Three out of four interactions of sex and levels of socio-economic status were found to be significant, which implies that even when relevant variables were considered together, the verbal creativity instructional materials have been able to bring in significant gains.

5.1.2.10 Hypothesis No. 10 : There will be no significant effect of verbal creativity instructional materials on male and female students of rural and urban backgrounds.

	Male	Female	
Urban	20	26	46
Rural	24	13	37
	44	39	83

't' tests for correlated measures and Welcoxon test (T) were run to find the significance of difference between means of post-test and pre-test.

Table 5.18 : Showing the Significance of Difference Between Means of Sex X Rural-Urban Interactions (Post-test Vs Pre-test)

Type	N	Post-mean	Pre-mean	Student t	Significance	Wilcoxon T	Significance
Urban Males	20	111.1	65.65	3.67	S(P < .01)	28	S(P < .01)
Urban Females	26	80.31	71.77	1.49	N.S.	98	S(P=0.05)
Rural Males	24	41.04	21.33	4.2	S(P< .01)	31	S(P < .01)
Rural Females	13	41.23	16.46	3.98	S(P< .01)	1	S(P < .01)

The significance of 't' and 'T' values necessitated the rejection of Null hypotheses in three cases. In the case of urban females, under comparable situations and that too when T was found with (P = 0.05), the parametric 't' is to be more relied upon, and so the Null hypothesis was not rejected.

Males of rural and urban areas and rural females have done significantly well in the post-test compared to the pre-test. Only the urban females have not done well to attain the level of significance.

The males of rural and urban areas doing well is in consonance with the finding of hypothesis No. 4. The possible reason for the urban females not doing significantly well may be again found in the family. More of supervision on girls than boys may be the reason, especially the case in middle SES families.

5.1.2.1 Information Contained in the Cells with $N < 8$:

The information contained in some cells, having $N < 8$ (sections 5.1.2.2, 5.1.2.5, 5.1.2.8, 5.1.2.9) could not be meaningfully drawn out through significance testing. Although hypothesis testing could not be used with regard to these cells, their meaningfulness as sources of evidence in the study could hardly be neglected. These sources of evidence have therefore been analysed rather qualitatively on the basis of an examination of the performance in the creativity tests of the students belonging to these cells, as also from the qualitative data based on their reactions and responses. This part of the data analysis has therefore been presented after all other types of qualitative data have been presented (Vide section 5.7.0).

5.2.0 Correlational Data

(B) As has been described in chapter III, the Passi tests of Creativity were administered to the students of four schools, two being experimental and two control. The experimental school children were also administered comprehension test in Kannada by Dave, et al (1974) and Socio-economic status

scale by Aaron, et al. (1969).

The data collected by socio-economic status scale was used for deciding the levels of socio-economic status to which the students belonged. That data have been used in Part A of this chapter and various significance tests have been worked out.

The comprehension test answer scripts were scored and the total for each student was found out. As the verbal creativity instructional materials were in Kannada, it was thought fit to use the comprehension test, to know the childrens' ability to comprehend the written passage.

The creativity scores were correlated with the comprehesion test scores of the students of experimental schools. Pearson's Product-Moment formula was used to compute the coefficient of correlation. The coefficients of correlation were separately computed for M.E.S. Higher Primary School and Government Model Primary School, Kaggalipura, and for both the schools together also.

M.E.S. Higher Primary School,	r	= 0.28
G.M.Primary School, Kagalipura,	r	= 0.22
Both the schools combined,	r	= 0.34

The r's that are got are well below 0.4, i.e.,to say that there is positive but low correlation between comprehension test scores and the creativity scores. The low

'r's imply that it is nneeessary to comprehend the ideas before the children can think creatively. The grasping of the idea properly is a pre-requisite to further creative thinking, but its role is rather low. Had there been high correlation, then the creative thinking would have become a similar activity like comprehending a written passage.

The positive but low correlation led the investigator to an interesting inference that even though the verbal creativity instructional materials are to be comprehended well before an attempt is made to think creatively, the effect of such an ability is not very much in the increase of creativity scores, because the verbal creativity instructional materials were based on creative thinking abilities (Vide section 5.1.2.1)

5.3.0 Creative Rating Scale Data

(C) The students of experimental schools were observed by their teachers and rated before and after the administration of verbal creativity instructional materials, i.e., the treatment. The teachers had been oriented regarding the use of creativity rating scale, during the orientation programme held before the treatment started for the students.

The urban experimental school teachers rated their students of VI standard, twice before and twice after the experiment. The rural experimental school teachers could rate

only once before and only once after the experiment, owing to the paucity of staff. In both the schools, the same students were observed by the same teachers before and after the experiment.

The ratings given to each student on various factors like Fluency, Flexibility, etc., were summed up to arrive at a summated rating. In the rural school the summated rating itself was used for testing the significance of difference between the means of those ratings. In the urban school, two summated ratings were added up to arrive at a score and those scores were used to find the means and significance of difference between the means thereof.

As had been decided earlier and done in Part A, both the parametric and non-parametric tests were used to test the significance of difference between the means, i.e., t test and Wilcoxon test (Z). As N was large, Z was computed from U in Wilcoxon test.

Table 5.19 : Showing the Significance of Difference Between Means of Pre- and Post-ratings

School	N	Post-mean	Pre-mean	t	Significance	Wilcoxon Z	Significance
M.E.S.	46	30.3	20.57	12.22	S(P < .01)	5.73	S(P < .01)
G.M.P.	37	13	9.3	4.16	S(P < .01)	3.42	S(P < .01)

The values of 't' and 'Z' necessitated the rejection of Null hypotheses, i.e. the difference between post-observation ratings and pre-observation ratings is significant. The students have got better ratings after the experiment, than before.

The result implies that there were some behavioural changes in the children and that too perceptibly, which made them get better ratings after the treatment or the verbal creativity instructional materials were able to bring out clear and perceptible changes in the behaviour of children, which were reflected in the ratings of children by the teachers.

The change in the behaviours of children as reflected by the ratings of teachers show that cognitive input, that is verbal creativity instructional materials and creativity climate that was maintained in the class during the experiment were able to bring in significant changes in behaviour. The behavioural changes were also found in the answers given by high gainers and low gainers during the interviews. The investigator also found the changes in thinking process gradually during the experiment. The occassional feedback given by the parents during the experiment could also be mentioned here, as evidence.

5.4.0 Reaction Questionnaire Data

During the treatment, the investigator administered reaction questionnaire, two parts at a time, to know the reactions of the children on the verbal creativity instructional materials. As there were nine chapters, the last part had to be administered after the nineth chapter was over. The data so collected were consolidated and percentages were calculated. The suggestions and difficulties, the students had expressed, were also quantitatively analysed. The consolidated data will be presented partwise and questionwise, in this section. There will be 9 parts as there were 9 chapters in the instructional materials.

5.4.1 PART I : Introduction

91.78 % of the children havef felt that the chapter 'Introduction' was highly informative, whereas 8.22 % of them said that it was not.

68.06 % of the children have said that the chapter motivated them sufficiently, whereas 31.94 % of them have said that it did not.

89.33 % of the children would like to become highly creative persons, whereas 10.67 % of them do not want to.

The suggestions given by children have been categorised for the benefit of seeing the similarities well. Two of the students have said that introduction chapter could have also

been in the form of a story. Another student feels that the incident of Leaf - Donkey - Linga - Bull, could have been explained more. One student has said that he could have modified the chapter by reading some books, while another feels that the investigator should have informed them to bring the first chapter.

Majority of students feel that the first chapter has served its purpose. The second question having a comparatively lower percentage indicates, the children's descrimination ability, with which they have answered the questions.

Out of the six students who have given suggestions, two of them have suggested that this chapter could have also been in the form of a story, coupled with another student, who wants more explantion of an incident. This means that children liked the story format of the instructional materials, which was the case, in the present investigation.

Even though 91.78 % and 89.33 % of children have said that the chapter was highly informative and they would like to become highly creative persons, respectively, only 68.8% of the children have said that the chapter motivated them sufficiently. This speaks of the descriminating ability of the children and the cautiousness of the students to commit themselves, that they have been really motivated.

5.4.2 PART 2 : Story with Consequences Situations

- 90.54 % of the students have said that the story 'Kalyani' was interesting, whereas 9.46 % of them have said that it was not.
- 73.97 % of the children have said that the consequences situations tickled their imagination, whereas, 26.03% have said that consequences situations did not tickle their imagination.
- 75.68 % of the students said that it was fun to imagine, whereas 24.32 % have said that it was not.

The difficulties, the children faced while solving the Consequences situations have been categorised. Five of the children say that they did not face any difficulty whereas many have expressed different types of difficulties. Thirteen students say that some difficulty was felt, but have not specified the types of difficulty. The types of difficulty others have specified with their numbers are (i) some were difficult to answer (6) (ii) we thought but found it difficult to put it (7), (iii) understanding the question was the problem (2), (iv) I was afraid of answering some questions (3), (v) The paper you gave (duplicating paper) was not good to write (1), (vi) we were ashamed as to why some answers did not flash to us (3), (vii) we could not tell our friends, even though they asked us (1), (viii) thinking of many responses was a difficulty (1), (ix) some letters were the cause of difficulty (2).

It is interesting to note that the children have expressed their difficulties starting from quality of paper, duplicating, etc., to understanding the problem and thinking of many responses, whose number compared to the whole group is small Majority of the students agree that the story 'Kalayani' was interesting and it was fun to imagine and the consequences situation did tickle their imagination.

73.97 % of the children have said that the consequences situations tickled their imagination and 75.68 % of them have said that it was fun to imagine. The approximately equal percentages though looks strange, show the quality of the students, viz., almost the same number of them have opined positively to the similar questions. This also speaks of the reliability of the instrument, as it gets positive responses, almost equally to similar questions.

5.4.3 PART 3 : Story with Puzzle Solving

- 91.3 % of the children have expressed that the story was interesting and 8.7 % have said that the story was not interesting.
- 76.63 % of the students have said that the 'Catch' was easily forth-coming to them, whereas 23.37 % of them have said it was with difficulty.
- 95.65 % of the students felt that puzzle solving was an enjoyable exercise, whereas 4.35 % do not feel to be an enjoyable exercise.

The difficulties experienced by the children while solving puzzles have been grouped to have better understanding.

Thirteen of the students say some puzzles were difficult, whereas 3 of them pinpoint 'beggars problem's and one of them Raja Rani's and clock problem as difficult ones. Four of them say that they did not face any difficulty where many have expressed different types of difficulties whose number have been put in brackets along with the difficulties. (i) I could not understand some puzzles (10), (ii) some sentences were difficult to grasp (2), (iii) I was afraid of some puzzles in the beginning (8), (iv) for me puzzle solving is impossible (5), (v) thinking in proper manner was difficult (6), (vi) I had no experience of solving puzzles (1), (vii) I was finding it difficult to put it (2), (viii) I committed mistakes in some (7), (ix) for some, I had to request others (1), (x) Then I could not solve, but now I can (1), (xi) The puzzles at the end were more difficult (1), (xii) The number of puzzles were more (2).

It is interesting to note that various types of difficulties have been expressed starting from understanding of sentences, puzzles,etc., to a statement puzzle solving is impossible for me by five students.

Majority of the students agree that the story 'Visit to the City of Fishes' was interesting, the puzzle solving

was an enjoyable exercise and the 'catch' was easily forth coming. A total of 15 students, 10 saying that they could not understand the puzzles and 5 declaring that the puzzle solving was impossible for them, calls for some rethinking on the difficulty of puzzles, may be, the puzzles could have been more simpler. This gets credence with the drop in percentage to 76.63% who got 'catches' easily i.e. 23.37% were finding it difficult to get 'catches'.

5.4.4 PART 4 : Story With Riddle Solving

- 84.44 % of the children have said that the story was interesting, whereas 15.56 % of them have said that it was not interesting.
- 83.7 % of the children have said that the riddles were attractive to solve, but 16.3 % have said that they were not.
- 64.44 % had the experience of solving riddles earlier, but 35.56 % did not have.
- 75.33 % have said that riddle solving is easier to puzzle solving, whereas, 26.67 % have said 'no' to the question.

The difficulties again have been categorised. Five of the children say that there was no difficulty at all, but nine of them have said that some difficulty was felt but have not specified the difficulties. Some have specified the riddles which were difficult, like, rotis to be eaten without breaking

them (1), hand on wood, in front of Shiva (1), (i) one of them feels that riddle solving took more time. (ii) I could not understand some (3), (iii) solving some of them took more time (1), (iv) there was difficulty because of no experience (3), (v) I did not know the proper mode of thinking (1), (vi) while solving, I used to be afraid (3), (vii) I could not solve the riddles at all (1), (viii) Some difficulty was felt, but not much (1), (ix) Solving the riddles continueously was a difficulty (1).

None has suggested any modification in the story, and only one has written 'no change'.

Again the difficulties expressed fall from understanding the riddles to a statement by one that I could not solve riddles at all. The number of students who say that solving of puzzle or riddle is impossible has come down from 5 to 1, which can be corroborated by the evidence that 75.33 % of the students feel that riddle solving easier to puzzle solving, that too when a sizeable number in the group, viz., 35.56 % did not have the experience of riddle solving earlier.

Majority of the students have said that the story 'Village for the Old and Retired' was interesting, and riddles were attractive to solve.

The reason for none suggesting any modification in the story could be that the story was good enough structurally,

flow-wise,etc., but also, that they had just been entering formal operations stage. Had they been of higher age group, they would have dealt with all classes of problems, including verbal, and could have thought logically and dealt with abstractions.

Even though 35.56 % of the children did not have the previous experience of solving the riddles earlier, 75.33 % of the children have said that riddle solving is easier to puzzle solving. This indicates the enormous potential of the riddle solving as a creativity fostering component, which is part of our culture, easily available, but neglected otherwise.

5.4.5 PART 5 : Story With Divergent Problems

- 91.67 % of the students have said that the story was interesting, whereas 8.33 % have said that the story was not interesting.
- 92.77 % of the students have said that thinking up more than one answer was an enjoyable exercise, whereas 7.23 % have said that it was not.
- 93.02 % of the children would like to solve problems of same type, but more difficult ones, whereas 6.98 % do not want to.

- 61.9 % of the children have said that the practice has helped them develop an attitude of not being contended with only one answer, whereas 38.1 % of them have said that the practice has not helped them in developing the attitude.

The difficulties felt by children have been categorised here. Thirteen of them have felt no difficulty while 13 of them say that they faced many difficulties. Two say that some problems were difficult, whereas other specify the problem of pond with crocodiles and that of skeleton. The other difficulties were (i) we took more time and met with some difficulties (3), (ii) problem of understanding (2), (iii) our creative abilities were less and couldn't do as much as Manju and Kamali (5), (iv) Immediate thinking was difficult (3), (v) I was unhappy, when I could not get the answers (1), (vi) we were not getting the correct responses (2).

One student has responded to the question, if given a chance, how would you like to modify the story ? i.e., Manju should go to different countries and become famous because of his creativity, he should collect information and meet people. The range of difficulties are from the problem of understanding to a statement of self-assessment, viz., our creative abilities were less and we could not do as much as Manju and Kamali. This implies the effectiveness of the identification models, having taken them as standards even.

Majority of the students have said that the story 'Manju in an Unknown Island' was interesting, thinking up more than one answer was an enjoyable exercise and they would like to solve the problems of more challenging type. It is interesting to note that the percentage has come down for the next question of attitude development, which tells upon the discrimination ability of the children with which they have answered the reaction questionnaire.

Only one student has suggested an interesting modification to the story, whereas all others have remained out of answering this question.

5.4.6 PART 6 : A New Approach to Solving Mysteries

- 46.51 % of the students have said that they were frightened by the story of kidnappings, thefts,etc., whereas 53.49 % of them have said that they were not.
- 80 % of the students have put forward hunches, like detectives in solving mystery plots, whereas 20 % of them have not put forward hunches.
- 61.18 % of the students say that the mystery plots were sufficiently challenging, whereas 38.82 % have said that they were not.
- 82.14 % of the students would like to be detectives and solve many mysteries, theft cases,etc., whereas 17.86 % of them do not want to become detectives. For the question

if not, two of them have said that there could be more quarrel cases, two of them say thieves could be caught two of them say that the problems evoked fear in them and one says that he doesn't like the police.

A sizeable number of students getting frightened, shows the tender age of the children, a majority of whom have the motivation to become detectives and solve mysteries, theft cases,etc. The ambivalence of this type is natural among primary children, who get drawn towards both simultaneouly. Majority of them have opined that they put forward hunches like detectives, and a sizeable number of them agree that mystery plots were sufficiently challenging. The opinions of children raises important questions for research, viz.,(i) should the crime and theft stories be removed from the instructional materials ? (ii) How much difficulty should be introduced into the mystery plots, we create, etc.

5.4.7 PART 7 : Children's Story Competition

- 92.77 % of the children were inspired to enter into story writing competition, whereas 7.23 % of them were not.
- 81.93 % of the students opine that the stories and the ideas given were not interesting, whereas, 18.07% do not.
- 84.34 % of the students have said that the ideas given for story writing lent themselves well for good stories, whereas 15.66 % of them do not feel so.

None has given any suggestion for improving the technique of story writing in 4 stages. Four have written 'no suggestions'.

The difficulties faced by students have been categorised here. Fifteen students have said that they did not have any difficulty. Five of them have said that some difficulty was felt, without specifying them. Five of them have said that some stories / ideas were difficult, like the dog that cannot bark. But four of the students have said story writing was really difficult. The other difficulties were (i) sometimes ideas and words were difficult to get (3), (ii) we did not have the practice of doing such things (3), (iii) the half to be completed stage was more difficult (1) (iv) while writing stories, we were afraid whether they were right (2). A suggestion has also been placed, viz., better ones could have been given.

Majority of the children were inspired to enter into a story writing competition, the stories and other ideas were interesting and the ideas given for story writing lent themselves well for story writing.

The difficulties range from problem of understanding words/ideas to a statement that story-writing is really difficult by four students.

The reason for none suggesting any other stages for improving the technique of story writing, may be that they were just entering formal operations stage.

5.4.8 PART 8 : Story With Poem Writing

- 83.13 % of the children have said that they liked the story, whereas 16.87 % of them have said that they did not.
- 73.49 % of the children have said that poem writing was an enjoyable activity, where 26.51 % of them have said that it was not.
- 61.73 % of the students have said that the ideas that were given for poem writing lent themselves well for poem writing, whereas 38.27 % of them feel that they did not lend themselves well.
- None has commented on the writing of poems in three stages, but five of them have written 'no comments'.
- 52.44 % of the children found it difficult to symbolise their thoughts, whereas 47.56 % of them found it easy to symbolize their thoughts.

The difficulties of children, while writing poems have been categorised here. Nineteen of them have said no difficulty at all. Eleven of them felt some difficulty in writing poems; whereas seven of them say that it was difficult to write poems. The other specific difficulties were, (i) poems were

difficult to understand (2), (ii) we did not have the practice of doing such things (1), (iii) Ideas did not flash to me first (1), (iv) 'Happy child, Nation's pride' was difficult for poem writing (1), (v) we were afraid of the correctness of the poems (1) (vi) spelling mistakes were a problem to all of us (1).

Majority of the students agree that the story 'face to face with barbarians' was interesting and they felt that poem writing as an enjoyable activity. Sizeable number of them opined that the ideas given for poem writing lent themselves well for poem writing.

Around half of the students found it easy to symbolize their thoughts and around half found it difficult. None has commented on the writing of poems at three stages.

Difficulties again range from problem of understanding to a statement that it was really difficult to write poems by seven students.

5.4.9 PART 9 : Story With Riddle Construction

- 71.74 % of the children have said that the story has brought home to them the troubles, creative children have to face, whereas 28.26 % of them have said that the story has not served the purpose.
- 78.02 % of the children have said that riddle construction is an interesting pastime, whereas 21.98% of them have said that it is not.

- 78.89 % of the children have said that the ideas lent themselves well for riddle construction, whereas 21.11% of them say that they did not.
- 70.79 % of the students have said that it is appropriate to have two steps for riddle construction, but 29.21 % have said that they are not. For the question, if not suggest the type of steps, only two suggestions have been made . (i) You could have given us the meaning and asked us to think and complete the riddle (1), (ii) you could have given parallel names (2).
- 49.44 % of the children have said that they found it difficult to get analogies, whereas 50.56 % did not.

The difficulties faced by children, while constructing riddles have been categorised here. Twelve of them have said that they faced no difficulty, whereas, eighteen of them felt some difficulty and eight of them felt the difficulty in a few cases, without specifying them. Others specify them like papaya, mango, pan supari, (1), River, Bag (1), onion cutting, banana (1). The other difficulties were (i) we could not think up fast (3), (ii) our creative abilities were less (2), (iii) you avoided old ones and gave new ones (3), (iv) we could not put it properly (1), (v) we could not construct new ones (4), (vi) we were writing the uses in constructing the riddles (1), (vii) I did not have the experience and so the starting trouble (1), (viii) we were not thinking the right ones (1), (ix) we were bit afraid (2), (x) we did not think (2), (xi) some words were difficult (1)

Majority of the students agree that they learnt the trials and tribulations of creative children, that riddle construction is an interesting pastime, the ideas given lent themselves well for riddle construction and it is appropriate to have two stages for riddle construction.

Around half of the students had difficulty in getting analogies, but the remaining half did not have.

The difficulties range from the problem of not having experience to proper mode of thinking.

52.44 % of the children finding it difficult to symbolise their thoughts and 49.44 % of them finding it difficult to get analogies in part 8 and part 9 respectively, shows the sincerity with which the children have taken to answering reaction - questionnaire. Almost the same number of students answering similar questions in the same way, indicates the seriousness of thinking about thinking by the students.

5.4.10 Summative Interpretation of Reaction Questionnaire Data

The opinions of children in different parts of the instructional material have been analysed and separate interpretations have been made in the preceding section.

In this section a summative interpretation will be attempted, so as to get a comparative picture of the opinions of children in different parts of the reaction questionnaire.

If the difficulties and their number could be taken as an indicator of the 'difficulty with the component', then they range from 23 to 62. But many of the students have expressed more than one difficulty, as each one had been given three options. These numbers may give a rough picture. The number and categories of difficulties chapterwise have been presented in the following table.

Table 5.20 : Showing the Number and Categories of Difficulties experienced by Children

Sl.No.	Name of the Chapter	No. of difficulties	Categories
1.	Story with Consequences	39	9
2.	Story with Puzzle Solving	62	12
3.	Story with Riddle Solving	26	9
4.	Story with Divergent Problems	31	6
5.	Children's Story Competition	23	4
6.	Story with Poem Writing	26	6
7.	Story with Riddle Construction	50	11

The number of difficulties and categories of difficulties expressed indicate that puzzle solving and riddle construction as the 'most difficult' components. The categories of difficulties also increase with the number of difficulties is an interesting point to note. Each one of these categories

has been presented in the previous section. The number of difficulties in the 'story with riddle solving' being 26, speaks of the riddle solving being easier to puzzle solving and other components of 'creative problem solving' type. The ⊕ story writing has got least number as well as categories of difficulties, indicates that it is the easiest among all the components. It is interesting that story writing and poem writing have been put as less difficult than 'riddle construction' both in terms of number of difficulties as well as categories. May be, there is a hierarchy of activities of 'creative expression' according to the children, with story writing being more easy and riddle construction, being more difficult. The probable reason could be, the children find it difficult to make familiar strange using analogies. This gets support with 50 % of the children finding it difficult to get analogies. This finding is in conformity with that of Khatena (1977), who has concluded that 'Although the training programme significantly increased mean originality scores, it did not serve the function of significantly increasing the use of personal, fantasy, and symbolic analogy strategies'.

The types of difficulties expressed by children vary from ordinary difficulties to very important ones, viz., the

quality of paper to modes of thinking. It is interesting to note that some children have expressed difficulty in the domain of thinking, a perusal of which is important, as the purpose of constructing instructional materials was to make children think and think creatively. (i) Thinking of many responses was a difficulty, (ii) thinking in proper manner was difficult, (iii) I did not know the proper mode of thinking, (iv) solving the riddles continuously was a difficulty, (v) immediate thinking was difficult, (vi) ideas did not flash to me first, (vii) we could not think up fast, (viii) we were writing the uses in constructing riddles, etc. Cognizance of their shortcoming in 'thinking domain' itself could be considered as an important outcome of the study. The questions raised/ difficulties expressed by the children indicate the seriousness with which the children had taken to verbal creativity instructional materials.

The other general difficulties have been : (i) inability to understand the words, poems, etc., which supports the use of comprehension test in the beginning of the experiment; (ii) finding it difficult to put the ideas and words on paper; (iii) not having the experience of doing such activities earlier; and (iv) being afraid of the correctness of the responses, etc.

A few of the students have opined that their creative abilities were less and they could not do as much as Manju and Kamali. This speaks of the effectiveness of identification models, with whom the children identified themselves and compared themselves also.

5.5.0 Interview Data of Students

As has been described earlier, the high gainers and low gainers from both the experimental schools were selected. The difference between the post-test creativity scores and pre-test creativity scores was taken as the criterion of selection of these students. These children were interviewed in one of the classrooms of their school. They were called in, one by one and proper rapport was built by asking some general questions. Then the investigator started asking the questions he had prepared earlier. The students' answers have been quantitatively analysed here, taking into consideration high gainers first and then the low gainers. The analysed data has been arranged in the decreasing order of the frequencies with respect to the high gainers. The corresponding answers of the low gainers to the same question has been presented along with to get a comparative picture of high gainers and low gainers.

All the twelve students irrespective of whether they were high or low gainers have liked the programme conducted

by the investigator in their schools. Two of them have said that it was enjoyable and one has named the activity he liked, viz.,puzzle solving.

All the six high gainers were getting positive reinforcements from their friends. One was asked to dictate the answer to them and another was told 'who teaches all this, it is good' and one was asked as to 'who gave so much papers'. All the six low gainers also got good reinforcements from their friends, with words 'you said it', 'you did it', etc. Two of them were asked to dictate answers. None of the twelve students had any reaction from the neighbour.

All the six high gainers were feeling ashamed/depressed when they could not give the unusual or original response. One even determined to do better next time. All the six low gainers were feeling sorry that they could not give,one even said that his face fell on such occassions.

All the six high gainers have said that it was fun to imagine, one says that he could get Kamala falling into water before him, and two of them want to do better when they grow up. All the six low gainers also have said that it was fun to imagine, one says that it is easy and the other says that he gets new answers out of it.

All the six high gainers like sitting and imagining on the problem at hand, whereas five low gainers would like

to sit and imagine, one of these to some extent only. One has answered 'No' to this question.

All the six high gainers day dream and would like to become Doctor, Engineer, Police Inspector, Car driver etc. All the six low gainers also day dream but three would like to become Doctors, one Car driving, One Engineer and one wants to be in Corporation job.

All the six high gainers would think and solve the problem if given now, one of them feels that the problem appears before him. Five of the low gainers have said that they would think and answer, two of them stressing logicality. One has not responded to this question.

All the six gainers would think further for more answers. Three of the low gainers would like to think further, but the three rural low gainers have said that they would get satisfied.

All the six high gainers ask questions inquisitively about new things, as well as the six low gainers.

Five of the high gainers feel that there was no change in their behaviour, whereas, one says he used to make mischiefs, and now he plays and has stopped the mischiefs. Two of the low gainers have said that parents are better judges, two of them

say that there was no change and two of them did not respond to the question.

Five of the high gainers have given varieties of interests they are pursuing like, reading comics, putani, chandamama, stories, paper cutting, penmaking, making house with cigarette packs, one even feels like writing stories poems,etc. One has said that he has not pursued any interest. Four of the low gainers have said about their pursuit of interests like, Reading 'Sudha' magazine, Phantom, adventurous stories, match box arrangement, rearranging, pasting,etc. One has become a member of a library, whereas, two of them have not pursued any interest.

Five of the high gainers read children's stories in the magazines and feel happy, but one does not read, one among the five has pinpointed 'Sudha' magazine. Five of the low gainers have said that they do read children's stories in the magazines, one of them has given the name of 'Sudha', and one has said 'no'.

Four of the high gainers have tried to specify the difficulties they had, like not getting parents' help, starting trouble with some type of headache, and getting depressed when they could not get answer even after their thinking. Two of them did not respond to this question.

Three of the low gainers have pinpointed their difficulty, like, puzzle solving and riddle solving. Two of them had no difficulties and one did not respond.

Four oft the high gainers were getting verbal reinforcements, like, clever boy, do well both in studies and work, etc., when they did a novel thing. Two of them were not getting encouragement. All the six low gainers were getting encouragement, one of them was asked to by heart and the other was asked 'who is this man doing all this ?'

Three of the high gainers had encouragement from their fathers, one had brother along with the father, whereas one had the teacher. One had encouragement from all but one did not have encouragement from anybody. Three of the low gainers had encouragement from all and two had encouragement from teachers and one had encouragement from father.

Three of the high gainers have liked riddle solving very much and one each has liked puzzle solving, consequences situations and mystery plots. Three of the low gainers have liked riddle solving, two of them poem writing and one puzzle solving.

Regarding the parents reactions for the behaviour of these children at home, two of the high gainers were asked to read well, answer questions and get first rank, etc. Two

of them said 'no reactions'. One of them got abuses for concentrating on this from his brother, whereas, another got encouragement from his brother. Two of the low gainers got nice encouragement, two of them said 'no reactions' and two of them did not respond to the question.

Two of the high gainers concentrate on a particular thing in their mind and think about it. One has said that he thinks of mysteries, and one has said 'No'. Two of them did not respond to the question. Three of the low gainers would sit and think logically on the problem, one thinks of what he would be when he grows up, etc., two of them have said 'I don't know'.

None of the twelve students has given any reason for change in behaviour.

None of the twelve students have related any childhood experience that either supported or hindered their creativity. Many have said 'I don't know. Only one high gainer has recalled his sister saying 'good'.

5.5.1. Interpretation of Students Interview Data

The analysis of data in terms of how many high gainers and how many low gainers opine regarding the effectiveness of verbal creativity instructional materials led the investigator to the following interpretations.

The high gainers or low gainers cannot be distinguished in terms of liking of the programme, not feeling the changes in their behaviour, reinforcements they got from their friends, liking of the components, none being able to relate the childhood experiences, reading of children's stories, daydreaming and asking inquisitive questions.

The high gainers could be distinguished from the low gainers in terms of expressing difficulties of general nature, pursuit of interests being varied, source of encouragement being father, thinking more flexibly and less logically when given a problem, and not being satisfied with only one answer. All of them, except the first one are similar to the indicators of creative behaviour drawn by Lee and Williams (1972).

The perusal of the list of characteristics gives one, the general agreement between the high gainers and low gainers, but the differences are vital and very prominent from the point of view of creative thinking. The verbal creativity instructional materials were able to bring out the important differences between high gainers and low gainers. The general agreement in the first list shows the ability of the verbal creativity instructional materials to bring out the changes of general nature in students of both groups, viz., high gainers and low gainers.

5.6.0 Interview Data of Parents

The parents of high gainers and low gainers were contacted in their dwelling places and the purposes of the investigator's visit was explained to them. After a few general questions, they were asked the main question prepared earlier by the investigator. The responses of the parents have been quantitatively analysed, taking into consideration the parents of the high gainers first and then the parents of the low gainers to get a comparative picture. The quantitative analysis has been presented in the decreasing order of frequencies in case of high gainers.

All the six parents of high gainers said that their wards have started giving attention to magazine section, writing poems, jokes,etc. Three of the parents of low gainers said that their wards have started looking into small magazines, Bond stories, Phantom comics,etc., but the other three parents said their wards have not.

All the six parents of high gainers said that their children tell their activities, stories,etc. Four of the parents of low gainers tell their activities, stories,etc. in the house, one among them writes a diary. One does not tell anything in the house, and the other one discusses with his sister, who is his classmate also.

All the six parents of high gainers have said that their wards have started improvising or constructing something these days. Five of the parents of low gainers have said that their children have started doing something, but one has said that he does not allow the boy to do.

Five of the parents of high gainers had not observed any behavioural changes in their children during the programme, whereas, one said 'only a slight change'. Three of the parents of low gainers had not observed any change, but the other three said that concentration, deligence, alertness in work has grown.

Five of the parents of high gainers encourage their children, when they give unusual answers, one among the persons varies depending upon the occassions, and one does not encourage his child for such answers. Four of the parents of low gainers encourage their children, but two of them do not.

Five of the parents of high gainers have said that their children ask many questions and they do reinforce the children. One parent said that they do not have the opportunity. Five of the parents of low gainers also said that they encourage their ward's inquisitive questions and one said that he does not.

Five of the parents of high gainers have said that they do not provide scope for flexible ways of thinking, but one of the parents has said that he does. Four of the parents of low gainers provide opportunities in their own way, but two

of them said that they do not.

Five of the parents of high gainers encourage their children to ask inquisitive questions and one has not responded to the question. Four of the parents of low gainers also provide freedom and two say that their wards do not ask questions at all.

Four parents of high gainers had got the letter the investigator had sent through their children and two of them had not. Five of the parents of low gainers had got the letter, whereas, one had not got the letter.

Four of the high gainers had informed about the programme in the school, at house; whereas one had not, and a parent did not respond to this question . Five of the low gainers had informed their parents and one had not.

Four of the parents of high gainers had enquired about the programme, after becoming curious, whereas, two of them did not respond to this question. Five of the parents of low gainers had enquired and one had not.

Four of the parents of high gainers have said that their children day dream and two said that their children do not. Three of the parents of low gainers have said that their children do not day dream and one said that his ward does. The other two parents said that their children do it in different ways like, role playing like teachers, doing it with paper, mud,etc.

Four of the parents of high gainers have said that their children change the play or the game they are playing, but two of the parents said that their children do not. Three of the parents of low gainers have said that their children bring modifications in the games they play, but three of the parents have said that their wards play the same game.

Four of the parents of high gainers provide freedom to their wards to manipulate things at home, one said that he gives some freedom and one has not responded. Four of the parents of low gainers provide freedom, one feels he gives more freedom and oned does not provide freedom at all.

Three of the parents of high gainers said that they would encourage their children's creative abilities by encouraging words, guiding him,etc. Two of them said that they have not done and one did not respond to this question. Five of the parents of low gainers encourage their childrens' creative activities by (i) novel questions, keeping a prize to win, get books,etc. one did not respond.

Three of the parents of high gainers have said that they do not get anything but books. Two of them would get what their ward asks. One of the parents buys quiz books, playing instrument,etc. for his child. One of the parents of low gainers simply provides money and one does not buy anything for his child. The other four parents buy things their children like,

viz., screw driver, lamp, tops, carromboard, ball, paint box, map, rolling board, books, dolls, etc.

Two of the parents of high gainers said that their children's study habits have changed, three of the parents opined that the study habits have not changed and one did not respond to this question. Five of the parents of low gainers have said that their ward's study habits have not changed, but one has said that it has changed somewhat.

Two of the parents of high gainers ask the child again, when they do not know the answer, two of them tell their wards that they do not know and two of them search for answer or send him to the library or to consult others. Four of the parents of low gainers do one of these, viz., ask him to think or show him the way, find out for him, do reference in library or send him to others. One parent answers in a consoling manner and the other does not know what to do ?

None of the parents of high gainers had any reaction, as they had not seen any behavioural change. Four of the parents of low gainers did not have any reaction, but two of them had, like (i) it was welcome and different from stereotype (ii) hidden talent may find expression.

5.6.1 Interpretation of Parents' Interview Data

Analysis of the parents interview data in terms of how many parents of high gainers or low gainers opined regarding their children led the investigator to the following interpretations.

The parents of high gainers cannot be distinguished from the parents of low gainers in terms of their children informing them about the programme, they themselves enquiring about the programme, encouragement given by them to their children when their children give unusual answer, change in the study habits of their children, their children's day dreaming, modifications of the play/game their children play, their children asking many questions, improvisation or constructing something at home, freedom provided at home, and encouraging their children to ask inquisitive questions.

The parents of high gainers could be distinguished from parents of low gainers in terms of their children looking into magazine section of the paper, writing poems, jokes, etc., their children talking about their activities in the school or the stories they read, etc., in the home.

The parents of low gainers could be distinguished from parents of low gainers in terms of observing behavioural

changes in their children like concentration, diligence, alertness in work, etc., encouraging their children by asking novel questions, getting books, keeping a prize to win, etc., providing opportunities for their children to think flexibly, providing variety of things to their children, adopting variety of ways when they do not know the answer themselves.

A perusal of the above three paragraphs presents an inconsistent picture, viz., the parents of low gainers being more enthusiastic and responding well compared to the parents of high gainers. The reasons could be, two of the urban low gainers, Mahesh and Vidya were initially having high creativity scores. Their parents having recognized the worth of their children will naturally be more enthusiastic about them and provide good opportunities too, to their children. But why did these two kids score so low in the post-test ? In the case of Mahesh, it could be the motivational problem, whereas, in the case of Vidya, it is the emotional problem. Her mother narrated an incident, which might have caused the low score in her.

Vidya's father works at Karwar in Karnataka about 300 miles away from Bangalore. Around first of September, the family at Bangalore, got the news that he is transferred to Channapatna, which is just 40 miles away. Every one in the

family was happy. On 4th of September, the newspaper carried an item that the transfer has been cancelled. Vidya, the last child in the family, who is more attached to her father was highly depressed and wept before the family deity for an hour. The same day, the investigator gave the post-test, and her mother was of the opinion that her daughter has not done well because of her emotional stress.

Another reason for the parents of low gainers giving better responses than the parents of high gainers could be, that the rural parents, four of them being illiterate, do not know much about their children's education. The investigator did not have any way to cross-check the responses of them. It was good that they showed lot of interest in the project, but from their answers one could not delve deep into the creativity characteristics of their children. With their limited knowledge of school, curriculum, etc., they volunteered to help the investigator by expressing their opinions about their children. The lack of reliable and valid data from parents inhibits the investigator from drawing fruitful inferences.

5.7.0 Data Analysis Where Hypothesis Testing Could Not be Applied

As mentioned in section 5.1.2.11, hypothesis testing could not be applied in respect of the Cells having $N < 8$ occurring in sections 5.1.2.2, 5.1.2.5, 5.1.2.8, 5.1.2.9. The students coming under these particular cells could be located as two groups in terms of the variables of the study, viz., low SES students and rural - high SES students, the former being related to hypotheses 2, 5, 8 and 9 and the latter to hypothesis 8.

Out of six low SES students, 3 belonged to the rural area and 3 to the urban area. Creative potential wise, 3 were high creative potential students, two were middle creative potential students and one was a low creative potential student. Sexwise, 4 were boys and 2 were girls. An interesting aspect of this group is that one among them is a high gainer from rural experimental school. Their pre-test aggregate is 320 and post-test aggregate is 555, i.e., the mean has risen from 53.33 to 92.5.

Of seven rural high SES students coming under the interactional hypothesis No.8, three were boys and four were girls. Creative potentialwise, one was a high creative potential student, three were middle creative potential students

and three were low creative potential students. Their pre-test aggregate is 111 and post-test aggregate is 194, i.e., the mean has risen from 15.86 to 27.71.

Although the significance test could not be applied for the above cells, because of N being less than 8, the increase in mean creativity scores indicate that these two groups have had sufficiently good gains. The low SES students seem to have done better than rural high SES students in terms of mean gains. The reason for this could be found in the break up of students creative potentialwise and sexwise. The low SES group has more high creative potential students than rural - high SES group, and sexwise also they have more numbers of boys than girls. The analysis of the data in some other cells has revealed that high SES and female groups have not done significantly better (Vide sections 5.1.2.5, 5.1.2.9, 5.1.2.10).

The reactions expressed by these two groups of (low SES students and rural high SES students) students on reaction questionnaire were separated out to delve deep into their difficulties with the creativity instructional materials. In the table below the difficulties of students in their own words have been given chapterwise. The expression 'some difficulty' probably means that the students have faced some difficulty but are not in a

position to pinpoint the same. Similarly the expression 'some were difficult' probably means that some of the puzzles or mystery plots or stories, etc., were difficult to solve or difficult to write.

Table 5.21 : Showing the Difficulties of Low SES Students and Rural High SES Students in Each Chapter

Chapter	Low SES students	Rural high SES students
1. Introduction	--	Some ideas were difficult to understand.
2. Kalyani	Some were difficult, some responses were not flashing to us.	Some difficulty was felt. Some were difficult to respond
3. Visit to City of Fishes	Some were difficult like, beggars problem, clock puzzle, etc. Some were difficult to understand. Some difficulty	Some were difficult, but now I can think
4. Village for the old and retired	Some difficulty	Riddles were easy. Some were difficult.
5. Manju in an unknown island.	Some difficulty. Some were difficult. Immediate thinking was not possible.	Some difficulty. Some were difficult.
6. Children's story competition	Some difficulty. Some were difficult.	--
7. Face to face with barbarians	Sometimes only half could be written	Some difficulty
8. A Picnic	Some difficulty. Ideas did not flash to us.	Some difficulty, Some were difficult.

An examination of the table reveals that both the low SES students and rural high SES students have been vague in writing about their difficulties. The common expressions have been 'some difficulty' and 'some were difficult. The low SES students seem to have scored over the other group, as they have pinpointed some difficulties, like 'some responses were not flashing to us', 'immediate thinking was not possible' and mentioning the specific puzzles, mystery plots, etc., which were difficult.

This shows that when no significance test was applied, but the responses of students were qualitatively analysed, the low SES students seem to indicate better potential than rural SES students, which means that the learners have interacted with the instructional materials. Barring the group affiliation, all the above students have taken to the systematised instructional materials, seriously, seems to be a welcome change in the school.

The responses of Shivappa, a high gainer and a rural low SES student during the interview could be taken as a typical case for discussion. He had enjoyed the programme; was getting depressed when he was not getting answers; he got praises from friends like 'how did you think'; he was determining to solve the problem, when somebody commented on

his inability to solve the same; he had persued hobbies like, paper cutting, pasting, etc., he was finding it fun to imagine; he was thinking about mysteries while 'Sitting still and Concentrating; now he will think of more than one answer, instead of getting satisfied with one; and he is curious and asks inquisitive questions.

A perusal of the responses given by this rural low SES high gainer indicates the development of habits from creativity view point. Some of these characteristics are very much necessary for a creative person, like, perseverance, inquisitiveness, not being satisfied with one answer, etc.
