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CHAPTER IV

ANALYSIS AND INTERPRETATIONS

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The present chapter is devoted to analysis and interpretations of the data obtained from the experiment undertaken for testing the hypotheses as pointed out in the earlier chapters. Level of significance at 0.05 has been accepted for making decisions about rejecting or retaining the hypotheses.

As explained in caption 3.1.1 the experiment follows the 4 X 4 Latin Square Design with the same square replicated. One square with four subjects or four sequences in four rows gives in all 16 observations. Each row gives 4 observations.

Each group or cell (G) consists of 20 subjects i.e. each square is replicated 20 times. Thus, the total number of observations becomes 320. (16 experimental conditions X 20 replicates).

Table 4.1 provides the summary of the results for the criterion variables scores of achievements under planned testing conditions.

Based upon this set of data, summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.2.

Table :4.1: Summary of Achievement Scores

Group	Unit 1 Teacher I	Unit 2 Teacher II	Unit 3 Teacher III	Unit 4 Teacher I	Total
I	St_1 Ex=259 N=20	St_2 Ex=285 N=20	St_3 Ex=302 N=20	St_4 Ex=320 N=20	$EG_1=$ 1166 N=80
II	St_2 Ex=289 N=20	St_3 Ex=293 N=20	St_4 Ex=306 N=20	St_1 Ex=282 N=20	$EG_2=$ 1170 N=80
III	St_3 Ex=320 N=20	St_4 Ex=337 N=20	St_1 Ex=284 N=20	St_4 Ex=316 N=20	$EG_3=$ 1257 N=80
IV	St_4 Ex=349 N=20	St_1 Ex=268 N=20	St_2 Ex=299 N=20	St_3 Ex=310 N=20	$EG_4=$ 1226 N=80
Total Units	$EU_1=1217$ N=80	$EU_2=1183$ N=80	$EU_3=1191$ N=80	$EU_4=1228$ N=80	Grand Total 4819 N=320
Total Stra-tegies	$ESt_1=1093$ N=80	$ESt_2=1189$ N=80	$ESt_3=1225$ N=80	$ESt_4=1312$ N=80	

'E' Stands for '$\leq$'

Table :4.2: Summary of ANOVA of the Achievement

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	308.11	102.70	$MS_{TR}/MS_{E(b)}$ = 22.72	.01
Columns (Units)	3	17.24	5.74	$MS_{U}/MS_{E(b)}$ = 1.27	NS
Rows (Subjects+ Sequence)	79	3339.62	42.27		—
Sequence	3	73.63	24.54	$MS_{Seq}/MS_{E(a)}$ =0.57	NS
Error (a)	76	3265.99	42.97		
Residual Error (b)	234	1059.90	4.52		
Pooled Ss_{Seq} X Units	180	1027.66	5.70	MS_{Seq}/MS_{Pooled} = 0.08	NS
Latin Sq. Error	54	32.24	0.49		
Total	319	4724.87			

NS = Not Significant

Looking to the Table 4.2, it is seen that the test
of homogeneity of the two variances (i.e. the F ratio of
$MS_{Latin\ Sq.}$ / $MS_{Pooled\ Sq\ X\ U}$ is not significant i.e.
variance is homogeneous.

It is also seen that treatments contribute significantly
at 0.01 level. Thus, the effect of various strategies of
teaching is found significant when examined in terms of F
ratios. The concerned F ratio is 22.72 for df 3/234. This
value is significant at .01 level. It means that teaching
strategies have differential effects upon the achievement
scores of seventh class pupils in science.

In order to pin point the relative effectiveness of
teaching strategies and also to know the direction of their
efficiency, mean achievement scores of all children under each
strategy, were compared. For this comparison L.S.D. test
(Least Significance Difference Test - Extension of 't' test)
was used. Values calculated for level of significance at
0.05 level = 0.64 and at .01 level = 0.85.

Table 4.3 gives such means for achievement scores as
well as the 't' values meant for significance of difference
between means.

Table :4.3: Means of Achievement Scores

Treatments	Total Score	Mean	St_2	St_3	St_4
1. Lecture	1093	13.66	1.20^{**}	1.65^{**}	2.74^{**}
2. Lecture + Discussion	1189	14.86	–	0.45^{NS}	1.54^{**}
3. Lecture + Discussion + Practicals	1225	15.31	–	–	1.09^{**}
4. Lect. + Disc. + Practical+ A.V. aids	1312	16.40	–	–	–

  * Significant at .05 level
** Significant at .01 level
NS Not significant

The order of effectiveness of the teaching strategies in terms of achievement scores is Strategy IV, Strategy III, Strategy II and Strategy I with mean scores of 13.66, 14.86, 15.31, and 16.40 respectively. The 't' values given in Table 4.3 indicate that mean of achievement scores under strategy IV is significantly higher than those of Strategy I , II and III at .01 level. It is also indicated that mean under St_3 is significantly higher than that under St_1 at 0.01 level, and it is not more significant than that under St_2 . Similarly mean scores of St_2 is higher than that of St_1 at .01 level.

Table :4.4: Summary of Total Creative Thinking Scores

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 EX= 1651 N=20	St_2 EX=1671 N=20	St_3 EX=1672 N=20	St_4 EX=1781 N=20	EG_1=6776 N=80
II	St_2 EX=1648 N=20	St_3 EX=1612 N=20	St_4 EX=1767 N=20	St_1 EX=1604 N=20	EG_2=6631 N=80
III	St_3 EX=1506 N=20	St_4 EX=1555 N=20	St_1 EX=1514 N=20	St_2 EX=1573 N=20	EG_3=6148 N=80
IV	St_4 EX=1481 N=20	St_1 EX=1399 N=20	St_2 EX=1429 N=20	St_3 EX=1411 N=20	EG_4=5720 N=80
Total Units	EU_1=6286 N=80	EU_2=6238 N=80	EU_3=6382 N=80	EU_4=6369 N=80	Grand Total 25275 N=320
Total Strategies	ESt_1 6168 N=80	ESt_2 6322 N=80	EST_3 6201 N=80	ESt_4 6584 N=80	

E Stands for ' $\leq$ '

Table 4.4 above provides the summary of results for the criterion variable scores of Total Creative Thinking under planned testing conditions. Based upon this set of data, summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.5.

Table :4.5: Summary of ANOVA of the Total Creative Thinking

Source of Variance	df	Ss	Ms	F ratio	Level of Signifi-cance
Treatments (Strategies)	3	1337.00	445.6	7.71	.01
Columns (Units)	3	176.49	58.83	1.02	NS
Rows (Subjects+ Sequence)	79	289957.63	–	–	–
Sequence	3	8677.94	2892.65	.78	NS
Error (a)	76	281279.69	3701.05		
Residual Error (b)	234	13547.81	57.8	–	–
Pooled $Ss_{sq}X$ Units	180	13339.71	74.11	0.05	NS
Latin Sq. Error	54	208.1	3.85		
Total	319	305018.93	–	–	–

It is clear from Table 4.5 that the test of homogeneity

of the two variance (i.e. F ratio of $MS_{Latin\ Sq.}$ / $MS_{Pooled\ SS\ X\ U}$)

is not significant i.e. variance is homogeneous.

It is also evident that treatments contribute significantly

at .01 level. Thus, the effect of various strategies is found

significant when examined in terms of F ratio. The concerned F

ratio is 7.71 for df 3/234. This value is significant at .01

level. It means that teaching strategies have differential effects

upon the Total Creative Thinking Scores, of seventh class pupils.

In order to pin point the relative effectiveness of teaching strategies and also to know the direction of their efficiency mean scores of all the children under each strategy were compared. For this comparison L.S.D test (Least Significance Difference test - extension of 't' test) was used. Values calculated for level of significance at .05 level = 2.35 and at .01 level =3.10.

Table 4.6 gives such means for Total Creative Thinking scores as well as the 't' values meant for significance of difference between means.

Table :4.6: Means of Total Creative Thinking Scores

|	Treatments	Total Score	Mean	St_2	St_3	St_4
St_1	Lecture	6168	77.10	1.93^{NS}	0.41^{NS}	5.20^{**}
St_2	Lecture + Discussion	6322	79.03	–	1.52^{NS}	3.27^{**}
St_3	Lect.+ Disc. + Practicals	6201	77.51	–	–	4.79^{**}
St_4	Lect.+ Disc. + Pract. + A.V. Aids	6584	82.30	–	–	–

* Significant at .01 level
** Significant at .05 level
NS Not significant

The order of effectiveness of the teaching strategies in terms of total creative thinking scores is Strategy IV, Strategy II, Strategy III and Strategy I with mean scores of

Fig. 4.1   GRAPH SHOWING THE EFFECTS OF STRATEGIES ON THE
MEAN SCORES OF ACHIEVEMENT AND TOTAL CREATIVE THINKING
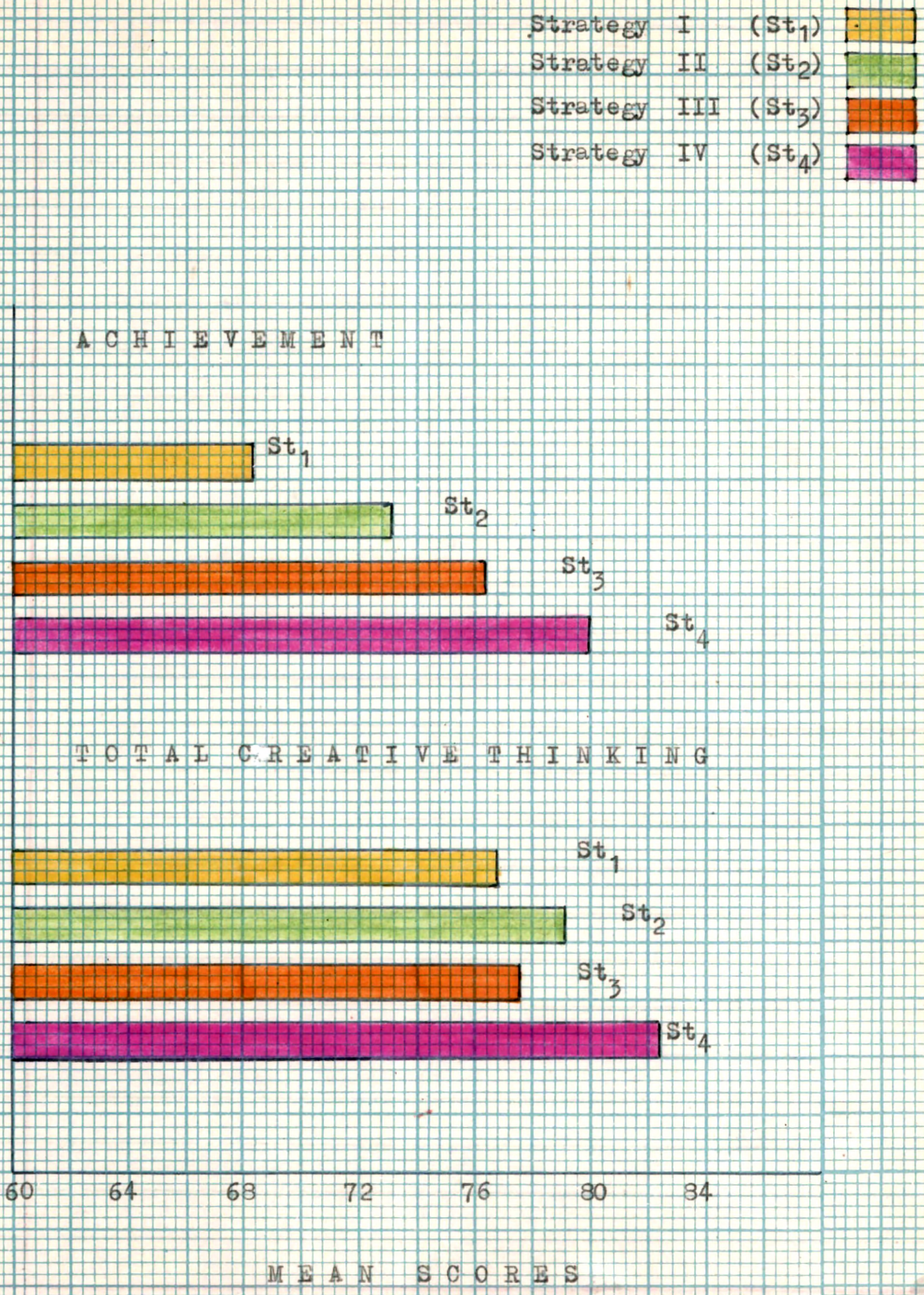
82.30, 79.03, 77.51 and 77.10 respectively. The 't' values given in Table 4.6 indicate that mean of total creative thinking scores under Strategy IV is significantly higher than those of all other strategies, at 0.01 level. While mean scores of St_1 , St_2 and St_3 are not significant, when compared to each other. It is remarkable that adding practical work in lecture and discussion (St_2), has no positive effect for developing creative thinking in the present experiment.

Table 4.7 on the next page provides the summary of results for the criterion variable scores of originality under planned testing conditions. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.8.

From the Table 4.8, it is seen that the test of homogeneity of the two variances (i.e. F ratio of $MS_{Latin\ Sq}$ / $MS_{Pooled\ Ss\ X}$ is not significant i.e. variance is homogeneous.

It is also clear that treatments contribute significantly at .05 level. Thus, the effect of various strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio is 3.58 for df 3/234. This value is significant at 0.05 level. It means that the strategies of teaching have differential effects upon the originality scores of seventh class pupils.

Table :4.7: Summary of Originality Scores

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=453 N=20	St_2 Ex=492 N=20	St_3 Ex=465 N=20	St_4 Ex=497 N=20	$EG_1=$ 1907 N=80
II	St_2 Ex=416 N=20	St_3 Ex=456 N=20	St_4 Ex=505 N=20	St_1 Ex=452 N=20	$EG_2=$ 1889 N=80
III	St_3 Ex=393 N=20	St_4 Ex=434 N=20	St_1 Ex=388 N=20	St_2 Ex=406 N=20	$EG_3=$ 1621 N=80
IV	St_4 Ex=398 N=20	St_1 Ex=372 N=20	St_2 Ex=376 N=20	St_3 Ex=367 N=20	$EG_4=$ 1513 N=80
Total Units	$EU_1=1720$ N=80	$EU_2=1754$ N=80	$EU_3=1734$ N=80	$EU_4=1722$ N=80	Grand Total 6930 N=320
Total Strategies	$ESt_1=1665$ N=80	$ESt_2=1750$ N=80	$ESt_3=1681$ N=80	$ESt_4=1834$ N=80	

'E' Stands for ' $\sum$ '

Table :4.8: Summary of ANOVA of the Originality

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	222.7	74.23	3.58	.05
Columns (Units)	3	8.2	2.73	0.13	NS
Rows (Strategies + Subjects)	79	39590.2	–	–	–
Sequence	3	1444.45	481.48	0.96	NS
Error (a)	76	38145.75	501.92		
Residual Error (b)	234	4837.1	20.67	–	–
Pooled SS_{Seq} X Units	180	4820.95	26.78	0.01	NS
Latin Sq. Error	54	16.15	0.3		
Total	319	44658.2			

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency, mean scores of all children under each strategy were compared. For the comparison least significance difference test (L.S.D.) was used. Values calculated for level of significance at 0.05 level = 1.41 and at 0.01 level = 1.86.

Table 4.9 gives such means for originality scores as well as the 't' values meant for significance of difference between means.

Table :4.9: Mean of Originality Scores

Treatments	Total Score	Mean	St_2	St_3	St_4
St_1 Lecture	1665	20.81	1.07^{NS}	0.2^{NS}	2.13^{**}
St_2 Lect. + Discussion	1750	21.88	–	0.87^{NS}	1.06^{NS}
St_3 Lect. + Disc. + Practical	1681	21.01	–	–	1.93^{**}
St_4 Lect. + Disc. + Pract. + A.V. Aids	1834	22.94	–	–	–

* Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

The order of the effectiveness of the teaching strategies in terms of originality scores is Strategy IV, Strategy II, Strategy III and Strategy I with mean scores of 22.94, 21.88, 21.01 and 20.81 respectively. The 't' values given in Table 4.9 indicate that mean of originality scores under Strategy IV is significantly higher than those of Strategies I and III at .01 level while mean scores of St_1 , St_2 and St_3 are not significant when compared to each other. From this it is clear that Strategy IV is superior to Strategies I, II and III.

Table 4.10 on the next page provides the summary of results for the criterion variable scores of flexibility under planned testing conditions. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is

Table :4.10: Summary of Flexibility Scores

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 3 Teacher 4	Total
I	St_1 Ex=490 N=20	St_2 Ex=488 N=20	St_3 Ex=492 N=20	St_4 Ex=545 N=20	$EG_1 =$ 2015 N=80
II	St_2 Ex=488 N=20	St_3 Ex=466 N=20	St_4 Ex=522 N=20	St_1 Ex=480 N=20	$EG_2 =$ 1956 N=80
III	St_3 Ex=446 N=20	St_4 Ex=479 N=20	St_1 Ex=461 N=20	St_2 Ex=464 N=20	$EG_3 =$ 1850 N=80
IV	St_4 Ex=459 N=20	St_1 Ex=406 N=20	St_2 Ex=418 N=20	St_3 Ex=401 N=20	$EG_4 =$ 1684 N=80
Total Units	$EU_1=1883$ N=80	$EU_2=1839$ N=80	$EU_3=1893$ N=80	$EU_4=1890$ N=80	Grand Total 7505 N=320
Total Strategies	$ESt_1=1837$ N=80	$ESt_2=1858$ N=80	$ESt_3=1805$ N=80	$ESt_4=2005$ N=80	

E Stands for '$\leq$'

given in Table 4.11.

Table ::4.11: Summary of ANOVA of The Flexibility

Source of Variance	df	cSs	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	294.08	98.02	16.3	.01
Columns (Units)	3	27.78	7.92	1.3	NS
Rows (Subjects + Sequence)	79	19918.55	252.13	41.95	
Sequence	3	790.76	263.59	1.05	NS
Error (a)	76	19127.79	251.68		
Residual Error (b)	234	1405.89	6.01	–	
Pooled Ss$_{seq}$ X Units	180	1397.56	7.76	.02	
Latin Sq. Error	54	8.33	0.15		
Total	319	21646.3			

Looking at the above table, it is seen that the test of homogeneity of the two variances (i.e. F ratio of

$MS_{Latin \ Sq}$ / $MS_{Pooled \ Ss \ X \ U}$) is not significant i.e. variance is homogeneous.

It is also seen that treatments contribute significantly at .01 level. Thus, the effects of various strategies of

teaching is found significant when examined in terms of F ratio.
The concerned F ratio happens to be 16.3 for df 3/234. This
value is significant at .01 level. It means that teaching
strategies have differential effects upon the flexibility
scores of seventh class pupils.

In order to pin-point the relative effectiveness of teaching
strategies and also to know the direction of their efficiency
mean scores of all children under each strategy were compared.
For the comparison least significant difference test was used.
Values calculated for level of significance at .05 level = 0.75
and at .01 level = 0.98.

Table 4.12 gives such means for Flexibility scores as well
as the 't' values meant for significance of difference between
means.

Table :4.12: Means of Flexibility Scores

Treatments		Total Score	Mean	St_2	St_3	St_4
St_1	Lecture	1837	22.96	0.27^{NS}	0.4^{NS}	2.1^{**}
St_2	Lect.+ Discussion	1858	23.23		0.67^{NS}	1.83^{**}
St_3	Lect.+ Disc.+ Practicals	1805	22.56			2.5^{**}
St_4	Lect.+ Disc.+ Pract.+ A.V.Aids	2005	25.06			

* Significant at .05 level
** Significant at .01 level
NS Not Significant

The order of effectiveness of the teaching strategies

in terms of flexibility scores is Strategy IV, Strategy II,

Strategy I and Strategy III with mean scores 25.06, 23.23,

22.96 and 22.56 respectively. The 't' values given in Table

4.12 indicate that mean of flexibility scores under Strategy

IV is significantly higher than those of all other strategies

at .01 level. While mean scores of St_1 , St_2 and St_3 are not

significant when compared to each other. It is remarkable that

Strategy III was least effective as far as flexibility is

concerned, Strategy IV was superior to Strategies I, II and III.

Table 4.13 provides the summary of results for the

criterion variable scores of fluency under planned testing

conditions. Based upon this set of data, summary of analysis of

variance on the lines of Latin Square Design is given in

Table 4.14.

From the Table 4.14, it is seen that the test of

homogeneity of the two variances (i.e. F ratio of

$MS_{Latin\ Sq.}$ / $MS_{Pooled\ SS\ X\ U}$) is not significant i.e. variance

is homogeneous.

It is also seen that contribution of treatments is not

significant. Thus the effect of various strategies of teaching

is not found to be significant when examined in terms of F ratio.

Table :4.13: Summary of Fluency Scores

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=708 N=20	St_2 Ex=684 N=20	St_3 Ex=667 N=20	St_4 Ex=624 N=20	$EG_1=$ 2683 N=80
II	St_2 Ex=692 N=20	St_3 Ex=690 N=20	St_4 Ex=642 N=20	St_1 Ex=621 N=20	$EG_2=$ 2645 N=80
III	St_3 Ex=695 N=20	St_4 Ex=740 N=20	St_1 Ex=665 N=20	St_2 Ex=635 N=20	$EG_3=$ 2735 N=80
IV	St_4 Ex=739 N=20	St_1 Ex=672 N=20	St_2 Ex=703 N=20	St_3 Ex=643 N=20	$EG_4=$ 2757 N=80
Total Units	$EU_1=2834$ N=80	$EU_2=2786$ N=80	$EU_3=2677$ N=80	$EU_4=$ 2523 N=80	Grand Total 10820 N=320
Total Strategies	$ESt_1=2666$ N=80	$ESt_2=2714$ N=80	$ESt_3=2695$ N=80	$ESt_4=2745$ N=80	

E   Stands   for   '≤'

Table :4.14: Summary of ANOVA of the Fluency

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	41.27	13.75	0.78	NS
Columns (Units)	3	96.10	32.03	1.82	NS
Rows (Subjects + Sequence)	79	46668.25	590.73	-	-
Sequence	3	713.87	237.96	0.39	NS
Error (a)	76	45954.38	604.60		
Residual Error (b)	234	4124.38	17.62		
Pooled SS seq X Units	180	3947.27	21.93	0.15	NS
Latin Sq. Error	54	177.11	3.28		
Total	319	50930.75			

The concerned F ratio happens to be 0.78 for df 3/234. This is not significant. It means that the strategies of teaching have no differential effects upon the fluency scores of seventh class pupils.

The details given in the foregoing tables, and the analysis carried out on the preceding pages of the present chapter, were about the achievement, total creative thinking and its

Fig. 4.2   GRAPH SHOWING THE EFFECTS OF STRATEGIES ON THE MEAN SCORES OF THE COMPONENTS OF CREATIVE THINKING
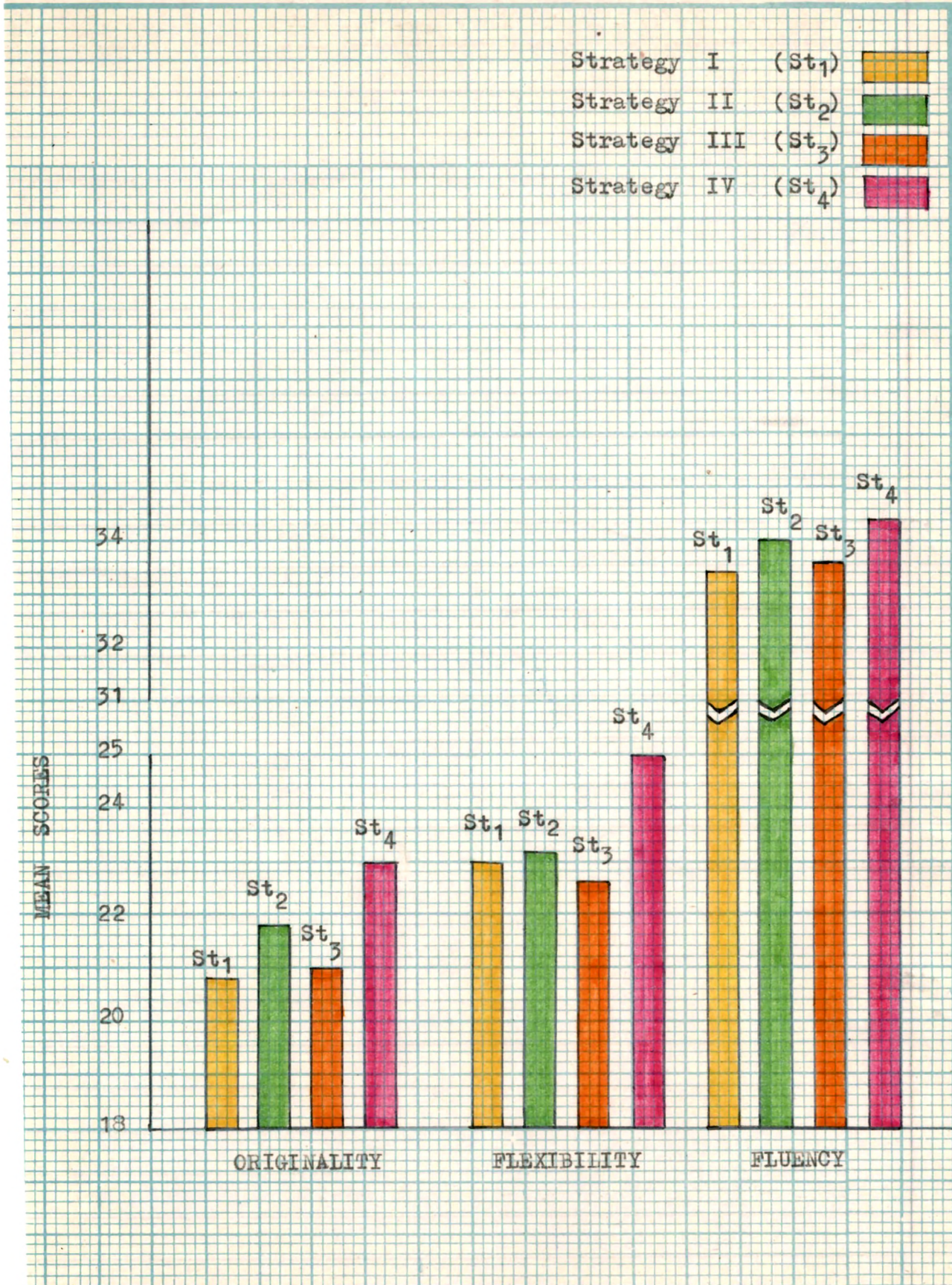
components viz., fluency, flexibility and originality. All
pupils of all groups were taken as the sample, neglecting the
other factors. Now onwards in doing the analysis that follow,
I.Qs., achievement scores, sex and creativity will be taken
into consideration.

Upper 25 percent is selected from each group that is
comprised of pupils having high I.Qs., high achievement scores
and high creative thinking scores. This group is selected on
the basis of its performance on the pre-test. In a similar
manner is selected lower 25 percent from each group. Thus, the
form of the experimental design is 4 X 4 Latin Square with 5
replicates and total observations for each factor happen to be
4 X 4 X 5 = 80.

Table 4.15 provides the summary of results for criterion
variable scores of Total Creative Thinking of the high achiever
pupils. Based upon this set of data summary of analysis of
variance on the lines of the Latin Square Design is given in
Table 4.16.

Looking at the Table 4.16, it is seen that the contribution
of treatments is not significant at accepted level i.e. 0.05.
Thus, the effect of various strategies of teaching is not found
significant when examined in terms of F ratio. The concerned F
ratio happens to be 0.88 for df 3/54. This is not significant

Table :4.15: Summary of Total Creative Thinking Scores of High Achievers

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=501 N=5	St_2 Ex=521 N=5	St_3 Ex=529 N=5	St_4 Ex=532 N=5	EG_1 = 2083 N=20
II	St_2 Ex=493 N=5	St_3 Ex=499 N=5	St_4 Ex=491 N=5	St_1 Ex=496 N=5	EG_2 = 1979 N=20
III	St_3 Ex=521 N=5	St_4 Ex=498 N=5	St_1 Ex=486 N=5	St_2 Ex=522 N=5	EG_3 = 2027 N=20
IV	St_4 Ex=471 N=5	St_1 Ex=451 N=5	St_2 Ex=472 N=5	St_3 Ex=451 N=5	EG_4 = 1845 N=20
Total Units	EU_1=1986 N=20	EU_2=1969 N=20	EU_3=1978 N=20	EU_4=2001 N=20	Grand Total 7934 N=80
Total Strategies	ESt_1=1934 N=20	ESt_2=2008 N=20	ESt_3=2000 N=20	ESt_4=1992 N=20	

E Stands for ' $\leq$ '

Table :4.16: Summary of ANOVA of the Total Creative Thinking of High Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	169.75	56.58	0.88	NS
Columns (Units)	3	27.65	9.22	0.14	NS
Row (Subjects)	19	49454.55	2602.87	-	-
Sequence	3	1549.75	506.58	0.17	NS
Error (a)	16	47904.8	2994.05		
Residual Error (b)	54	3469.6	64.25	-	—
Total	79	53121.55	-	-	-

at 0.05 level. It means that the selected strategies of teaching have no differential effects upon the total creative thinking scores of seventh class pupils who are high achievers.

The Table 4.17 on the next page provides the summary of results for criterion variables scores of originality of the high achievers group. Based upon this set of data summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.18.

Looking to Table 4.18 it is clear that contribution of treatments is not significant even at 0.05 level. Thus, the

Table :4.17: Summary of Originality Scores of High Achievers

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=131 N=5	St_2 Ex=153 N=5	St_3 Ex=161 N=5	St_4 Ex=150 N=5	EG_1 = 595 N=20
II	St_2 Ex=147 N=5	St_3 Ex=147 N=5	St_4 Ex=160 N=5	St_1 Ex=137 N=5	EG_2 = 591 N=20
III	St_3 Ex=156 N=5	St_4 Ex=158 N=5	St_1 Ex=131 N=5	St_2 Ex=159 N=5	EG_3 = 604 N=20
IV	St_4 Ex=123 N=5	St_1 Ex=118 N=5	St_2 Ex=122 N=5	St_3 Ex=110 N=5	EG_4 = 474 N=20
Total Units	EU_1=557 N=20	EU_2=576 N=20	EU_3 =574 N=20	EU_4 =556 N=20	Grand Total 2263 N=80
Total Strategies	ESt_1=517 N=20	ESt_2=581 N=20	ESt_3=574 N=20	ESt_4=591 N=20	

E Stands for ' $\leq$ '

Table :4.18: Summary of ANOVA of Originality of High
              Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	165.74	55.25	1.74	NS
Columns (Units)	3	17.24	5.75	0.18	NS
Row≤ (Subjects)	19	8328.64	438.35	-	-
Sequence	3	577.94	192.65	0.4	NS
Errors (a)	16	7750.7	484.42		
Residual Error (b)	54	1718.77	31.83		
Total	79	10230.39	-	-	-

effect of various strategies of teaching is not found significant
when tested in terms of F ratio. The concerned F ratio is 1.74
for df 3/54. This is not significant at 0.05 level. It means that
the selected strategies of teaching have no differential effect
upon the originality scores of seventh class pupils having high
achievement.

Table 4.19 on the next page provides the summary of
results for criterion variable scores of Flexibility of Thinking
of the high achievers group. Based upon this set of data summary
of analysis of variance on the lines of the Latin Square design
is given in Table 4.20.

Table :4.19: Summary of Flexibility Scores of High
Achievers

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=153 N=5	St_2 Ex=157 N=5	St_3 Ex=150 N=5	St_4 Ex=163 N=5	$EG_1=$ 623 N=20
II	St_2 Ex=140 N=5	St_3 Ex=140 N=5	St_4 Ex=133 N=5	St_1 Ex=143 N=55	$EG_2=$ 556 N=20
III	St_3 Ex=145 N=5	St_4 Ex=140 N=5	St_1 Ex=148 N=5	St_2 Ex=137 N=5	$EG_3=$ 570 N=20
IV	St_4 Ex=140 N=5	St_1 Ex=126 N=5	St_2 Ex=136 N=5	St_3 Ex=129 N=5	$EG_4=$ 531 N=20
Total Units	$EU_1=578$ N=20	$EU_2=563$ N=20	$EU_3=567$ N=20	$EU_4=572$ N=20	Grand Total 2280 N=80
Total Strategies	$ESt_1=570$ N=20	$ESt_2=570$ N=20	$ESt_3=564$ N=20	$ESt_4=576$ N=20	

E   Stands for '$\mathcal{E}$'

Table :4.20: Summary of ANOVA of Flexibility of High
Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	3.6	1.2	0.25	NS
Columns (Units)	3	6.3	2.1	0.44	NS
Rows (Subjects)	19	3132	164.84	–	–
Sequence	3	226.3	75.43		
Error (a)	16	2905.7	181.61	0.42	NS
Residual Error (b)	54	260.1	4.82	–	–
Total	79	3402.00			

ing
Look at the above Table 4.20, it becomes evident that the

contribution of treatments is not significant even at 0.05

level. Thus, the effect of various strategies of teaching is

not found significant when examined in terms of F ratio. The

concerned F ratio is 0.25 for df 3/54. This is not significant

at 0.05 level. It means that the selected strategies of teaching

have no differential effect upon the flexibility scores of

seventh class pupils having high achievement.

Table :4.21: Summary of Fluency Scores of High Achievers

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=217 N=5	St_2 Ex=211 N=5	St_3 Ex=218 N=5	St_4 Ex=219 N=5	$EG_1 = 865$ N=20
II	St_2 Ex=206 N=5	St_3 Ex=212 N=5	St_4 Ex=198 N=5	St_1 Ex=216 N=5	$EG_2 = 832$ N=20
III	St_3 Ex=220 N=5	St_4 Ex=200 N=5	St_1 Ex=207 N=5	St_2 Ex=226 N=5	$EG_3 = 853$ N=20
IV	St_4 Ex=208 N=5	St_1 Ex=207 N=5	St_2 Ex=214 N=5	St_3 Ex=212 N=5	$EG_4 = 841$ N=20
Total Units	$EU_1=851$ N=20	$EU_2 =830$ N=20	$EU_3=837$ N=20	$EU_4=873$ N=20	Grand Total 3391 N = 80
Total Strategies	$ESt_1=847$ N=20	$ESt_2 =857$ N=20	$ESt_3 =862$ N=20	$ESt_4 =825$ N=20	

E Stands for '$\leq$'

The Table 4.21 provides the summary of results for criterion variable scores of Fluency of Thinking of the high achievers group. Based upon this set of data summary of analysis of variance on the lines of Latin Square Design is given in Table 4.22 below.

Table :4.22: Summary of ANOVA of Fluency of High Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	40.35	13.45	0.94	NS
Columns (Units)	3	53.95	17.98	1.25	NS
Rows (Subjects)	19	7025.25	369.75	–	–
Sequence	3	30.95	10.32		
				0.02	NS
Error (a)	16	6994.3	437.14		
Residual Error (b)	54	775.45	14.36		
Total	79	7895.0			

Looking at the above table, it is clear that the treatments do not contribute significantly, even at 0.05 level. Thus, the effects of various strategies of teaching is not found significant when tested in terms of F ratio. The concerned F ratio is 0.94 for df 3/54. This is not significant at 0.05 level. It means that selected strategies of teaching have no differential effect upon the fluency scores of seventh class pupils having high achievement.

Table :23: Summary of Total Creative Thinking of Low Achievers Scores

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=257 N=5	St_2 Ex=241 N=5	St_3 Ex=237 N=5	St_4 Ex=253 N=5	$EG_1 = 988$ N=20
II	St_2 Ex=213 N=5	St_3 Ex=181 N=5	St_4 Ex=256 N=5	St_1 Ex=216 N=5	$EG_2 = 871$ N=20
III	St_3 Ex=313 N=5	St_4 Ex=324 N=5	St_1 Ex=337 N=5	St_2 Ex=344 N=5	$EG_3 = 1318$ N=20
IV	St_4 Ex=285 N=5	St_1 Ex=262 N=5	St_2 Ex=272 N=5	St_3 Ex=260 N=5	$EG_4 = 1079$ N=20
Total Units	$EU_1 = 1073$ N=20	$EU_2 = 1008$ N=20	$EU_3 = 1102$ N=20	$EU_4 = 1073$ N=20	Grand Total 4256 N=80
Total Strategies	$ESt_1 = 1072$ N=20	$ESt_2 = 1075$ N=20	$ESt_3 = 991$ N=20	$ESt_4 = 1118$ N=20	

E Stands for ' $\sum$ '

Table 4.23 above provides the summary of results for criterion variable scores of Total Creative Thinking of the low achievers pupils. Based upon this set of data summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.24 below.

Table :4.24: Summary of ANOVA of the Total Creative Thinking of Low Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	421.5	140.5	2.44	NS
Columns (Units)	3	237.1	79.03	1.37	NS
Rows (Subjects)	19	48458.3	2550.44	-	-
Sequence	3	5388.3	1796.1	0.67	NS
Error (a)	16	43070.0	2691.88		
Residual Error (b)	54	3103.9	57.48	-	-
Total	79	52220.8			

From Table 4.24, it is clear that the contribution of treatments is not significant at 0.05 level. Thus, the effect of various strategies of teaching is not found significantly effective, when examined in terms of F ratio. The concerned F ratio happens to be 2.44 for df 3/54. This is not significant at 0.05 level. It means that the selected strategies of teaching have no differential effects upon the total creative thinking scores of seventh class pupils having low achievements.

Table :4.25: Summary of Originality Scores of Low Achievers

Groups	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=68 N=5	St_2 Ex=79 N=5	St_3 Ex=58 N=5	St_4 Ex=54 N=5	$EG_1 = 259$ N=20
II	St_2 Ex=57 N=5	St_3 Ex=41 N=5	St_4 Ex=44 N=5	St_1 Ex=54 N=5	$EG_2 = 196$ N=20
III	St_3 Ex=73 N=5	St_4 Ex=82 N=5	St_1 Ex=84 N=5	St_2 Ex=82 N=5	$EG_3 = 321$ N=20
IV	St_4 Ex=57 N=5	St_1 Ex=67 N=5	St_2 Ex=64 N=5	St_3 Ex=72 N=5	$EG_4 = 260$ N=20
Total Units	EU_1=255 N=20	EU_2=269 N=20	EU_3=250 N=20	EU_4=262 N=20	Grand Total 1036 N=80
Total Strategies	ESt_1=273 N=20	ESt_2=282 N=20	ESt_3=244 N=20	ESt_4=237 N=20	

E Stands for '$\leq$'

The above Table 4.25 gives the summary of results for

criterion variable scores of Originality of thinking of the low

achievers group. Based upon this set of data summary of analysis

of variance on the lines of the Latin Square Design is given in Table 4.26 below.

Table :4.26: Summary of ANOVA of Originality of Low Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	71.7	23.9	1.97	NS
Columns (Units)	3	10.3	3.43	0.28	NS
Rows (Subjects)	19	5229.8	275.25	–	–
Sequence	3	390.7	130.23	0.43	NS
Errors (a)	16	4839.1	302.44		
Residual Error (b)	54	654.0	12.11		
Total	79	5965.8	–	–	–

Table 4.26 above indicates that the contribution of treatment is not significant even at 0.05 level. So the effect of various strategies of teaching is not found significant when examined in terms of F ratio. The concerned F ratio happens to be 1.97 for df 3/54. This is not significant at 0.05 level. It means that the selected strategies of teaching have no differential effect upon the originality scores of seventh class pupils having low achievement.

Table :4.27: Summary of Flexibility Scores of Low Achievers

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=74 N=5	St_2 Ex=68 N=5	St_3 Ex=77 N=5	St_4 Ex=87 N=5	$EG_1=$ 306 N=20
II	St_2 Ex=70 N=5	St_3 Ex=61 N=5	St_4 Ex=91 N=5	St_1 Ex=71 N=5	$EG_2=$ 293 N=20
III	St_3 Ex=101 N=5	St_4 Ex=106 N=5	St_1 Ex=104 N=5	St_2 Ex=104 N=5	$EG_3=$ 415 N=20
IV	St_4 Ex=98 N=5	St_1 Ex=81 N=5	St_2 Ex=83 N=5	St_3 Ex=74 N=5	$EG_4=$ 336 N=20
Total Units	$EU_1=343$ N=20	$EU_2=316$ N=20	$EU_3=355$ N=20	$EU_4=336$ N=20	Grand Total 1350 N=80
Total Strate- gies	$ESt_1=330$ N=20	$ESt_2=325$ N=20	$Est_3=313$ N=20	$ESt_4=382$ N=20	

E = E

The above table provides the summary of results for the criterion variable scores of Flexibility of Thinking of the low achievers group. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.28.

Table :4.28: Summary of ANOVA of Flexibility of Low
Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	139.65	46.55	5.5	.01
Columns (Units)	3	40.05	13.35	1.58	NS
Rows (Subjects)	19	3793.75	199.67	–	–
Sequence	3	449.05	149.68	0.72	NS
Error (a)	16	3344.7	209.4		
Residual Error (b)	54	457.3	8.47	–	–
Total	79	4430.75	–	–	–

From the above Table 4.28, it is seen that the treatments
contribute significantly at 0.01 level. Thus, the effects of
various selected strategies of teaching is found significant
when tested in terms of F ratio. The concerned F ratio is 5.5
for df 3/54. This value is significant at 0.01 level. It
means that teaching strategies have differential effects upon
the flexibility scores of seventh class pupils having low
achievements.

In order to pin-point the relative effectiveness of teaching
strategies and also to know the direction of their efficiency

means of flexibility scores of selected children under each strategy were compared. For this comparison L.S.D. Test was applied. Values calculated for level of significance at 0.05 and 0.01 level are 1.85 and 2.47 respectively. Table 4.29 gives such means for flexibility scores of low achievers group as well as 't' values meant for significance of difference between means. The order of effectiveness of teaching strategies in terms of flexibility scores of low
                              Strategy IV,
achievers group is Strategy I, Strategy II and Strategy III
with mean scores of 19.01, 16.50, 16.25 and 15.65 respectively. The 't' values given in Table 4.29 indicate that mean of flexibility scores of low achievers group under St_4 is significantly higher than those of St_1 , St_2 and St_3 at 0.01 level. While mean scores of St_1 St_2 and St_3 are not significant

Table 4.29: Means of Flexibility Scores of Low Achievers

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	330	16.50	0.25^{NS}	0.85^{NS}	2.60^{**}
2. Lecture+Discussion	325	16.25		0.60^{NS}	2.85^{**}
3. Lect.+Disc.+ Practicals	313	15.65			3.47^{**}
4. Lect.+Disc.+Pract. +A.V.Aids	382	19.01			

   *   Significant at .05 level
 **   Significant at .01 level
NS   Not Significant

even at 0.05 level. when compared to each other. It is
remarkable that addition of practical work in lecture and
discussion has no positive effect for developing flexibility
of thinking in low achievers group of seventh class.

Table :4.30: Summary of Fluency Scores of Low Achievers

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=115 N=5	St_2 Ex=94 N=5	St_3 Ex=102 N=5	St_4 Ex=112 N=5	$EG_1 = 423$ N=20
II	St_2 Ex=91 N=5	St_3 Ex=79 N=5	St_4 Ex=121 N=5	St_1 Ex=91 N=5	$EG_2 = 382$ N=20
III	St_3 Ex=139 N=5	St_4 Ex=136 N=5	St_1 Ex=149 N=5	St_2 Ex=158 N=5	$EG_3 = 582$ N=20
IV	St_4 Ex=130 N=5	St_1 Ex=114 N=5	St_2 Ex=125 N=5	St_3 Ex=114 N=5	$EG_4 = 483$ N=20
Total Units	EU_1=475 N=20	EU_2=423 N=20	EU_3=497 N=20	EU_4=475 N=20	Grand Total 1870 N=80
Total Stra-tegi-es	ESt_1=469 N=20	ESt_2=468 N=20	ESt_3=434 N=20	ESt_4=499 N=20	

Table 4.30 above provides the summary of results for
criterion variable scores of Fluency of Thinking of the low

achievers group. Based upon this set of data summary of analysis of variance on the lines of Latin Square Design is given in Table 4.31 below.

Table :4.31: Summary of ANOVA of Fluency of Low Achievers

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	105.85	35.28	1.73	NS
Columns (Units)	3	148.15	49.38	2.42	NS
Rows (Subjects)	19	8507.75	447.78	–	–
Sequence	3	1132.05	377.35	0.82	NS
Error (a)	16	7375.70	460.98		
Residual Error (b)	54	1101.0	20.39	–	–
Total	79	9862.75			

From the above Table 4.31, it is clear that the contribution of treatments is not significant, even at 0.05 level. Thus, the effect of various strategies of teaching is not found significant, when tested in terms of F ratio. The concerned F ratio is 1.73 for df 3/54. This is not significant at 0.05 level. It means that the selected strategies of teaching have no differential effect for increasing fluency scores of seventh class pupils having low achievement.

Table :4.32: Summary of Total Creative Thinking Scores
of High I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=497 N=5	St_2 Ex=564 N=5	St_3 Ex=525 N=5	St_4 Ex=558 N=5	$EG_1=$ 2144 N=20
II	St_2 Ex=485 N=5	St_3 Ex=503 N=5	St_4 Ex=505 N=5	St_1 Ex=481 N=5	$EG_2=1974$ N=20
III	St_3 Ex=502 N=5	St_4 Ex=498 N=5	St_1 Ex=481 N=5	St_2 Ex=519 N=5	$EG_3=$ 2000 N=20
IV	St_4 Ex=480 N=5	St_1 Ex=453 N=5	St_2 Ex=473 N=5	St_3 Ex=473 N=5	$EG_4=$ 1879 N=20
Total Units	$EU_1=1964$ N=20	$EU_2=2018$ N=20	$EU_3=1984$ N=20	$EU_4=2031$ N=20	Grand Total 7997 N=80
Total Strategies	$ESt_1=1912$ N=20	$ESt_2=2041$ N=20	$ESt_3=2003$ N=20	$ESt_4=2041$ N=20	

Table 4.32 provides the summary of results for the criterion
variable scores of Total Creative Thinking of the high intelligent
pupils. Based upon this set of data, summary of analysis of
variance on the lines of the Latin Square Design is given in Table
4.33 on the next page .

Table :4.33: Summary of ANOVA of the Total Creative
Thinking of High I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	555.64	185.21	2.84	.05
Columns (Units)	3	141.74	47.25	0.73	NS
Rows (Subjects)	19	33852.64	1781.72	-	-
Sequence	3	1802.54	600.85	0.3	NS
Error (a)	16	32050.10	2003.1		
Residual Error (b)	54	3518.87	-	-	-
Total	79	38068.89			

From the above table, it is seen that the treatments

contribute significantly at 0.05 level. Thus, the effect of

various strategies of teaching is found significant when

examined in terms of F ratio. The concerned F ratio is 2.84

for df 3/54. This value is significant at 0.05 level. It means

that teaching strategies have differential effects upon the

total creative thinking scores of seventh class pupils having

high I.Q.

In order to pin-point the relative effectiveness of

teaching strategies and also to know the direction of their

efficiency means of creative thinking scores of the selected

children under each strategy were compared. For this comparison

L.S.D. Test was applied. Values calculated for level of

significance at 0.05 level = 5.13 and 0.01 level = 6.84.

Table :4.34: Means of Total Creative Thiniing Scores
of High I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	1912	95.6	6.45^*	4.55^{NS}	6.45^*
2. Lect. + Discussion	2041	102.05		1.9^{NS}	0.00^{NS}
3. Lect. + Disc. + Practicals	2003	100.15			1.9^{NS}
4. Lect. + Disc. + Pract. + A.V. Aids	2041	102.05			

*   Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

Table 4.34 above gives such means for total creative

thinking scores of high intelligente pupils as well as the 't'

values meant for significance of difference between means.

The order of effectiveness of teaching strategies in

terms of total creative thinking scores is Strategy IV,

Strategy II, Strategy III and Stratevy I with mean scores of

102.05, 102.05, 100.15 and 95.6 respectively. The 't' values

given in Table 4.34 indicate that mean of total creative

thinking scores of high I.Q. pupils under St_4 and St_2 are

significantly higher than that of St_1 , at 0.05 level. It is

also seen that effectiveness of St_2 is similar to St_4 , while

St_1 and St_3 are not significantly effective. It is also

seen that St_2 is more effective than St_3 i.e. addition of

practical thinking is not useful for increasing creative

thinking of seventh class pupils belonging to high I.Q.

group.

Table :4.35: Summary of Originality Scores of High
I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=137 N=5	St_2 Ex=175 N=5	St_3 Ex=156 N=5	St_4 Ex=155 N=5	EG_1=623 N=20
II	St_2 Ex=152 N=5	St_3 Ex=163 N=5	St_4 Ex=175 N=5	St_1 Ex=143 N=5	EG_2=633 N=20
III	St_3 Ex=135 N=5	St_4 Ex=140 N=5	St_1 Ex=115 N=5	St_2 Ex=137 N=5	EG_3=527 N=20
IV	St_4 Ex=144 N=5	St_1 Ex=121 N=5	St_2 Ex=132 N=5	St_3 Ex=130 N=5	EG_4=527 N=20
Total Units	EU_1=568 N=20	EU_2=599 N=20	EU_3=578 N=20	EU_4=565 N=20	Grand Total 2310 N=80
Total Strate-gies	ESt_1=516 N=20	ESt_2=596 N=20	ESt_3=584 N=20	ESt_4=614 N=20	

The above Table 4.35 provides the summary of results for

the criterion variable scores of Originality of the high

intelligent pupils. Based upon this set of data, summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.36 below.

Table :4.36: Summary of ANOVA of Originality of High I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	274.95	91.65	4.28	.01
Columns (Units)	3	35.45	11.82	0.55	NS
Rows (Subjects)	19	6446.25	339.28	–	–
Sequence	3	512.55	170.85	0.45	NS
Error (a)	16	6133.7	383.36		
Resudial Error (b)	54	1156.1	21.41	–	–
Total	79	7912.75	–	–	–

From the above Table 4.36, it is seen that the treatments contribute significantly at 0.01 level. Thus, the effect of various selected strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio happens to be 4.28 for df 3/54. This value is significant at 0.01 level. It means that teaching strategies have differential effects upon the originality scores of seventh class pupils having high I.Q.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency, means of originality scores of selected children were compared. For this comparison L.S.D. Test was applied. Values calculated for the level of significance at 0.05 level and 0.01 level are 2.93 and 3.91 respectively.

Table :4.37: Means of Originality Scores of High I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	516	25.8	4.0^{**}	3.4^{*}	4.9^{**}
2. Lect. + Discussion	596	29.8		0.6^{NS}	0.9^{NS}
3. Lect. + Disc. + Practicals	584	29.2			1.5^{NS}
4. Lect. + Disc. + Pract. + A.V. Aids	614	30.7			

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  *   Significant at 0.05 level
 **   Significant at 0.01 level
 NS   Not Significant
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Table 4.37 gives such means for Originality scores of high intelligent pupils as well as the 't' values meant for significance of difference between means.

The order of effectiveness of teaching strategies in terms of Originality scores is Strategy IV, Strategy II, Strategy III and Strategy I with mean scores of 30.7, 29.8, 29.2 and 25.8 respectively. The 't' values given in Table 4.37 indicate that mean of Originality scores under Strategies St_4 and St_2 are

significantly higher than that of St_1 at 0.01 level. It is also indicated that mean under St_3 is significantly higher than that under St_1 at 0.05 level, but St_3 is not superior than St_2. It is also remarkable that Strategy-4 is not significantly more effective than St_3 and St_2. In short, it can be seen from Table 4.37 that merely lecturing is not effective for developing originality of thinking of seventh class pupils having high I.Q.

Table :4.38: Summary of Flexibility Scores of High I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=144 N=5	St_2 Ex=163 N=5	St_3 Ex=149 N=5	St_4 Ex=173 N=5	$EG_1=$ 629 N=20
II	St_2 Ex=138 N=5	St_3 Ex=138 N=5	St_4 Ex=129 N=5	St_1 Ex=138 N=5	$EG_2=$ 543 N=20
III	St_3 Ex=151 N=5	St_4 Ex=159 N=5	St_1 Ex=153 N=5	St_2 Ex=153 N=5	$EG_3=$ 616 N=20
IV	St_4 Ex=145 N=5	St_1 Ex=127 N=5	St_2 Ex=134 N=5	St_3 Ex=127 N=5	$EG_4=$ 533 N=20
Total Units	$EU_1=578$ N=20	$EU_2=587$ N=20	$EU_3=565$ N=20	$EU_4=591$ N=20	Grand Total 2321 N=80
Total Strategies	$EST_1=562$ N=20	$ESt_2=588$ N=20	$ESt_3=565$ N=20	$ESt_4=606$ N=20	

E Stands for ' $\sum$ '

differential effect upon flexibility scores of seventh class
pupils having high I.Q.

In order to pin-point the relative effectiveness of
teaching strategies and also to know the direction of their
efficiency, means of flexibility scores of the selected
children under each strategy were compared. For this comparison
L.S.D. Test was applied. Values calculated for level of
significance at 0.05 and 0.01 level are 1.74 and 2.30 respectively.
Table 4.40 gives such means for flexibility scores of pupils
having high I.Q., as well as the 't' values meant for
significance of difference between means.

Table :4.40: Means of Flexibility Scores of High I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	562	28.1	1.3^{NS}	0.15^{NS}	2.2^{*}
2. Lect. + Discussion	588	29.4		-1.15^{NS}	0.9^{NS}
3. Lect. + Disc. + Practicals	565	28.5			2.05^{*}
4. Lect. + Disc. + Pract. + A.V. Aids	606	30.3			

* Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

The order of effectiveness of teaching strategies in terms
of flexibility scores is Strategy IV, Strategy II, Strategy III
and Strategy I, with mean scores of 30.3, 29.4, 28.5 and 28.1

respectively. The 't' values given in the Table indicate that

mean of high I.Q. group under Strategy IV is significantly

higher for developing flexibility than those of St_1 and St_3 at

0.05 level, while it is not significantly higher than that

of St_2. When compared to each other, the mean scores of St_1 , St_2

abd St_3 are not significant even at 0.05 level. It is also

seen that addition of discussion into lecture has positive

effects but addition of practical work has no positive effects

for increasing flexibility of thinking of experimental

subjects having high I.Q.

Table :4.41: Summary of Fluency Scores of High I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=216 N=5	St_2 Ex=226 N=5	St_3 Ex=220 N=5	St_4 Ex=230 N=5	EG_1= 892 N=20
II	St_2 Ex=195 N=5	St_3 Ex=202 N=5	St_4 Ex=201 N=5	St_1 Ex=200 N=5	EG_2=798 N=20
III	St_3 Ex=216 N=5	St_4 Ex=199 N=5	St_1 Ex=213 N=5	St_2 Ex=229 N=5	EG_3= 857 N=20
IV	St_4 Ex=191 N=5	St_1 Ex=205 N=5	St_2 Ex=207 N=5	St_3 Ex=216 N=5	EG_4= 819 N=20
Total Units	EU_1=818 N=20	EU_2=832 N=20	EU_3=841 N=20	EU_4=875 N=20	Grand Total N=80 3366
Total Strate- gies	ESt_1=834 N=20	ESt_2=857 N=20	ESt_3=854 N=20	ESt_4=821 N=20	

E Stands for ' $\leq$ '

Table 4.41 provides the summary of results for criterion variable scores of Fluency of Thinking of the high I.Q. group. Based upon this set of data summary of analysis of variance on the lines of Latin Square Design is given in Table 4.42.

Table 4.42: Summary of ANOVA of Fluency of High I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	43.65	14.55	0.72	NS
Columns (Units)	3	88.25	29.42	1.46	NS
Rows (Subjects)	19	5195.55	273.43	–	–
Sequence	3	259.45	86.48	0.28	NS
Error (a)	16	4936.1	308.51		
Residual Error (b)	54	1088.1	20.15	–	–
Total	79	6415.55	–	–	–

Looking at Table 4.42 it becomes evident that the contribution of ∂ treatments is not significant even at 0.05 level. Thus, the effect of various strategies of teaching is not found significant when examined in terms of F ratio. The concerned F ratio is 0.72 for df 3/54. This is not significant at 0.05 level. It means that the selected strategies of teaching have no differential effect upon the Fluency scores of seventh class pupils having high I.Q.

Table :4.43: Summary of Total Creative Thinking
Scores of Low I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit III Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=299 N=5	St_2 Ex=257 N=5	St_3 Ex=245 N=5	St_4 Ex=276 N=5	EG_1=1077 N=20
II	St_2 Ex=290 N=5	St_3 Ex=254 N=5	St_4 Ex=346 N=5	St_1 Ex=282 N=5	EG_2=1172 N=20
III	St_3 Ex=307 N=5	St_4 Ex=304 N=5	St_1 Ex=317 N=5	St_2 Ex=330 N=5	EG_3=1258 N=20
IV	St_4 Ex=283 N=5	St_1 Ex=283 N=5	St_2 Ex=272 N=5	St_3 Ex=233 N=5	EG_4=1071 N=20
Total Units	EU_1=1179 N=20	EU_2=1098 N=20	EU_3=1180 N=20	EU_4=1121 N=20	Grand Total 4578 N=80
Total Strategies	ESt_1=1181 N=20	ESt_2=1149 N=20	ESt_3=1039 N=20	ESt_4=1209 N=20	

E Stands for '$\leq$'

Table 4.43 provides the summary of results for the criterion variable scores of total creative thinking of the low intelligent pupils. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.44.

Table :4.44: Summary of ANOVA of the Total Creative
Thinking of Low I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	832.15	277.38	5.09	.01
Columns (Units)	3	258.25	86.08	1.58	NS
Rows (Subjects)	19	45537.45	2396.71	–	–
Sequence	3	1179.85	393.28	0.15	NS
Error (a)	16	44357.60	2772.35		
Residual Error (b)	54	2940.10	54.45	–	–
Total	79	49567.95	–	–	–

From the above table, it is seen that the treatments contribute significantly at 0.01 level. Thus, the effect of various strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio is 5.09 for df = 3/54. This value is significant at 0.01 level. It means that teaching strategies have differential effect upon the total creative thinking scores of seventh class pupils with low I.Q.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency,

means of creative thinking scores of the selected children under each strategy were compared. For this comparison L.S.D. Test was applied. Values calculated for level of significance at 0.05 level = 4.68 and at 0.01 level = 6.24.

Table :4.45: Means of Total Creative Thinking Scores of Low I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	1181	59.05	-1.6^{NS}	-7.1^{**}	1.4^{NS}
2. Lect. + Discussion	1149	57.45		-5.5^{*}	3.0^{NS}
3. Lect. + Disc. + Practicals	1039	51.95			8.5^{**}
4. Lect. + Disc. + Pract. + A.V. Aids	1209	60.45			

* Significant at 0.01 level
** Significant at 0.05 level
NS Not Significant

Table 4.45 above gives such means for total creative thinking scores of low intelligent pupils as well as 't' values meant for significance of difference between means. The order of effectiveness of teaching strategies in terms of total creative thinking scores of low intelligent pupils is Strategy IV, Strategy I, Strategy II and Strategy III with mean scores of 60.45, 59.05, 57.45 and 51.95 respectively. The 't' values given in Table 4.45 indicate that mean of total creative thinking scores of low intelligent pupils under St_4 is significantly higher than that of St_3 at 0.01 level, while it is not

significantly higher than those of St_1 and St_2. It is also seen that mean scores under Strategy I is higher than that of Strategy St_3 at 0.01 level of significance while mean scores of St_2 is significantly higher than that of St_3 at 0.05 level. When compared with each other, the mean scores of St_1 and St_2 are not significant. It is remarkable that addition of practical work in St_2 has no positive effect for developing creative thinking in low intelligent pupils.

Table :4.46: Summary of Originality Scores of Low I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=78 N=5	St_2 Ex=62 N=5	St_3 Ex=51 N=5	St_4 Ex=60 N=5	$EG_1=$ 251 N=20
II	St_2 Ex=75 N=5	St_3 Ex=58 N=5	St_4 Ex=70 N=5	St_1 Ex=74 N=5	$EG_2=$ 277 N=20
III	St_3 Ex=80 N=5	St_4 Ex=79 N=5	St_1 Ex=86 N=5	St_2 Ex=88 N=5	$EG_3=$ 333 N=20
IV	St_4 Ex=65 N=5	St_1 Ex=67 N=5	St_2 Ex=64 N=5	St_3 Ex=51 N=5	$EG_4=$ 247 N=20
Total Units	$EU_1=298$ N=20	$EU_2=266$ N=20	$EU_3=271$ N=20	$EU_4=273$ N=20	Grand Total 1108 N=80
Total Strategies	$ESt_1=305$ N=20	$ESt_2=289$ N=20	$ESt_3=240$ N=20	$ESt_4=274$ N=20	

E Stands for ' $\leqslant$ '

Table 4.46 provides the summary of results for
criterion variable scores of originality of low I.Q. pupils.
Based upon this set of data summary of analysis of variance
on the lines of the Latin Square Design is given in Table
4.47.

Table :4.47: Summary of ANOVA of Originality of Low I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	115.3	38.43	3.19	.05
Columns (Units)	3	30.7	10.23	0.85	NS
Rows (Subjects)	19	4422.7	232.77	–	–
Sequence	3	235.6	78.53	0.3	NS
Error (a)	16	4187.1	261.69		
Residual Error (b)	54	651.5	–	–	–
Total	79	5220.2			

From Table 4.47 it is clear that the contribution of
treatments is significant, at 0.05 level. Thus, the effect
of various selected strategies of teaching is found significant
when tested in terms of F ratio. The concerned F ratio is
3.19 for df 3/54. This is significant at 0.05 level. It
means that the selected strategies of teaching have differential
effect upon the originality scores of seventh class pupils

having low I.Q.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency mean of originality scores of the selected children under each strategy were compared. For the comparison L.S.D. Test was applied. Values calculated for level of significance at 0.05 level and 0.01 level are 2.21 and 2.95 respectively.

Table :4.48: Means of Originality Scores of Low I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	305	15.25	-0.8^{NS}	-3.25^{**}	-1.55^{NS}
2. Lect. + Discussion	289	14.45		-2.45^{*}	-0.75^{NS}
3. Lect.+ Disc. + Practicals	240	12.00			1.70^{NS}
4. Lect. + Disc. + Pract. + A.V.Aids	274	13.70			

* Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

The above Table 4.48 gives such means for originality scores of low intelligent pupils as well as 't' values meant for significance of difference between means. The order of effectiveness of teaching strategies in terms of originality scores of low intelligent pupils is Strategy I, Strategy II, Strategy IV and Strategy III with mean scores of 15.25, 14.45, 13.70 and 12.00 respectively. The 't' values given in Table 4.48 indicate that mean of originality scores of low intelligent

pupils under St_1 is significantly higher than that of St_3 at 0.01 level, while it is not significantly higher than those of St_2 and St_4. It is also seen that St_2 is significantly more effective than St_3 at 0.05 level. When compared with St_1, and St_2 it is remarkable that Strategy III and Strategy IV have no positive effect for developing originality in low intelligent group of pupils of seventh class. It means that practical works and use of A.V. aids are not beneficial for developing Originality in low intelligent pupils.

Table :4.49: Summary of Flexibility Scores of Low I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=84 N=5	St_2 Ex=80 N=5	St_3 Ex=76 N=5	St_4 Ex=92 N=5	$EG_1=332$ N=20
II	St_2 Ex=90 N=5	St_3 Ex=84 N=5	St_4 Ex=117 N=5	St_1 Ex=91 N=5	$EG_2=382$ N=20
III	St_3 Ex=93 N=5	St_4 Ex=100 N=5	St_1 Ex=92 N=5	St_2 Ex=96 N=5	$EG_3=381$ N=20
IV	St_4 Ex=85 N=5	St_1 Ex=87 N=5	St_2 Ex=83 N=5	St_3 Ex=77 N=5	$EG_4=332$ N=20
Total Units	$EU_1=352$ N=20	$EU_2=351$ N=20	$EU_3=368$ N=20	$EU_4=356$ N=20	Grand Total 1427 N=80
Total Strate-gies	$ESt_1=354$ N=20	$ESt_2=349$ N=20	$ESt_3=330$ N=20	$ESt_4=394$ N=20	

E Stands for 'Σ'

Table 4.49 provides the summary of results for the criterion variable scores of Flexibility of Thinking of the low intelligent group. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.50.

Table :4.50: Summary of ANOVA of Flexibility of Low I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	108.54	36.18	4.17	.01
Columns (Units)	3	9.14	3.05	0.35	NS
Rows (Subjects)	19	3191.14	167.95	–	–
Sequence	3	122.54	40.85	0.21	NS
Error (a)	16	3068.6	191.79		
Residual Error (b)	54	468.07	8.67	–	–
Total	79	3776.89	–	–	–

Looking at the above table, it is clear that the treatments contribute significantly at 0.01 level. Thus, the effect of various strategies of teaching is found significant when examined in terms of F ratio. The related F ratio is 4.17 for df 3/54. This value is significant at 0.01 level and it indicates that selected strategies of teaching have differential effects upon the flexibility scores of seventh class pupils

having low I.Q.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction oft their efficiency, means of flexibility scores of selected children under each strategy were compared. For this comparison L.S.D. Test was applied. Values calculated for level of significance at 0.05 level and 0.01 level are 1.87 and 2.49 respectively.

Table 4.51 gives such means for flexibility scores of low intelligent pupils as well as 't' values meant for significance of difference between means. The order of effectiveness of teaching strategies in terms of flexibility scores of low intelligent group is Strategy IV, Strategy I,Strategy II

Table :4.51: Means of Flexibility Scores of Low I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	354	17.7	-0.25^{NS}	-1.2^{NS}	2.0^{*}
2. Lect.+ Discussion	349	17.45		-0.95^{NS}	2.25^{*}
3. Lect. + Disc. + Practicals	330	16.5			3.2^{**}
4. Lect. + Disc. + Pract. + A.V. Aids	394	19.7			

* Significant at 0.05 level
** Significant at 0.01 level   NS   Not Significant

and Strategy III with mean scores of 19.7, 17.7, 17.45 and 16.5 respectively. The 't' values given in Table 4.51 indicate that mean of flexibility scores of low intelligent group under Strategy IV

is significantly higher than those of St_1 and St_2 at 0.05 level

and that of St_3 at 0.01 level. While mean scores of St_1 , St_2

and St_3 are not significant even at 0.05 level when compared to

each other. It is remarkable that addition of practical work in

lecture and discussion has no positive effect for developing

flexibility of thinking in low intelligent group of present

experimental subjects.

Table :4.52: Summary of Fluency Scores of Low I.Q.

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=137 N=5	St_2 Ex=115 N=5	St_3 Ex=98 N=5	St_4 Ex=124 N=5	$EG_1 =$ 474 N=20
II	St_2 Ex=125 N=5	St_3 Ex=112 N=5	St_4 Ex=159 N=5	St_1 Ex=117 N=5	$EG_2=$ 513 N=20
III	St_3 Ex=134 N=5	St_4 Ex=125 N=5	St_1 Ex=139 N=5	St_2 Ex=146 N=5	$EG_3=$ 544 N=20
IV	St_4 Ex=133 N=5	St_1 Ex=129 N=5	St_2 Ex=125 N=5	St_3 Ex=105 N=5	$EG_4=$ 492 N=20
Total Units	EU_1 =529 N=20	EU_2=481 N=20	EU_3=521 N=20	EU_4=492 N=20	Grand Total 2023 N=80
Total Strate-gies	ESt_1=522 N=20	ESt_2=511 N=20	ESt_3=449 N=20	ESt_4=541 N=20	

E Stands for ' Σ '

Table 4.52 provides the summary of results for the criterion variable scores of Fluency of Thinking of the low intelligent group. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.53 bwlow.

Table :4.53: Summary of ANOVA of Fluency of Low I.Q.

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	237.75	79.25	4.17	.01
Columns (Units)	3	78.75	26.25	1.38	NS
Rows (Subjects)	19	8483.15	446.48	–	–
Sequence	3	183.1	61.03	0.12	NS
Error (a)	16	8300.05	518.75		
Residual Error (b)	54	1028.75	19.05	–	–
Total	79	9828.4	–	–	–

From the above table, it is seen that the treatments contribute significantly at 0.01 level. Thus, the effect of selected strategies of teaching is found significant when tested in terms of F ratio. The concerned F ratio is 4.17 for df 3/54 . This value is significant at 0.01 level. It implies that teaching strategies have differential effect upon the fluency scores of seventh class pupils having low intelligence.

In order to understand the relative effectiveness of teaching strategies and also to know the direction of their

efficiency, means of fluency scores of the selected pupils

under each strategy were compared. For this comparison L.S.D.

Test was applied. Values calculated for level of significance

at 0.05 and at 0.01 level are 2.77 and 3.70 respectively.

Table :4.54: Means of Fluency Scores of Low I.Q.

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	522	26.10	-0.55	-3.65[*]	0.95[NS]
2. Lect. + Discussion	511	25.55	-	-3.1[*]	1.5[NS]
3. Lect. + Disc. + Practicals	449	22.45	-	-	4.6[**]
4. Lect.+Disc.+Pract.+ A.V. Aids	541	27.05	-	-	-

   * Significant at 0.05 level
 ** Significant at 0.01 level
NS Not Significant

Table 4.54 above gives such means for fluency scores of

low intelligent pupils as well as 't' values meant for signifi-

cance of difference between means.

The order of effectiveness of teaching strategies in terms

of fluency scores is Strategy IV, Strategy I, Strategy II and

Strategy III with mean scores of 27.05, 26.1, 25.55 and 22.45

respectively. The 't' values given in Table 4.54 indicate that

mean of fluency scores of low intelligent group under Strategy IV

is significantly higher than that of Strategy III at 0.01 level.

It is also seen that St_1 and St_2 are significantly more effective

than St_3 at 0.05 level. It is remarkable that St_2 is not superior to St_1 for developing fluency in low intelligent group, and it is also seen that St_3 is less effective than all other strategies. It means that addition of practical work in St_1 and St_2 has no positive effect in increasing fluency among low intelligent group.

Table :4.55: Summary of Total Creative Thinking Scores of Boys

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=973 N=12	St_2 Ex=984 N=12	St_3 Ex=1013 N=12	St_4 Ex=1079 N=12	$EG_1=$ 4049 N=48
II	St_2 Ex=1135 N=12	St_3 Ex=1121 N=12	St_4 Ex=1172 N=12	St_1 Ex=1089 N=12	$EG_2=$ 4517 N=48
III	St_3 Ex=1012 N=12	St_4 Ex=1042 N=12	St_1 Ex=1008 N=12	St_2 Ex=1054 N=12	$EG_3=$ 4116 N=48
IV	St_4 Ex=950 N=12	St_1 Ex=905 N=12	St_2 Ex=935 N=12	St_3 Ex=879 N=12	$EG_4=$3669 N=48
Total Units	$EU_1=4070$ N=48	$EU_2=4052$ N=48	$EU_3=4128$ N=48	$EU_4=4101$ N=48	Grand Total 16351 N=192
Total Strategies	$ESt_1=$ 3975 N=48	$ESt_2 =$ 4108 N=48	$ESt_3 =$ 4025 N=48	$ESt_4 =$ 4243 N=48	

E Stands for ' $\leq$ '

Table 4.55 provides the summary of results for criterion variable scores of Total Creative Thinking of the boys. Based upon this set of data summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.56.

Table :4.56: Summary of ANOVA of the Total Creative Thinking of Boys

Source of Variance	df	Ss	Ms	F ratio	Level of Signifi- cance
Treatments (Strategies)	3	857.5	285.83	4.59	.01
Columns (Units)	3	70.6	23.53	0.38	NS
Rows (Subjects)	47	178659.7	3801.27	–	–
Sequence	3	7539.7	2513.23	0.65	NS
Error (a)	44	171120.0	3889.1		
Residual Error (b)	138	8594.2	62.28	–	–
Total	191	188182			

It is clear from the above table that the treatments contribute significantly at 0.01 level. Thus, the effect of various strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio is 4.59 for df 3/138. This value is significant at 0.01 level. It means that teaching strategies have differential effect upon the total creative thinking scores of boys of seventh class.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency, means of creative thinking scores of selected children under each strategy were compared. For this comparison L.S.D. Test was applied. Values calculated for level of significance at 0.05 level = 3.17 and at 0.01 level = 4.18. Table 4.57 gives such means for total creative thinking scores of boys as well as 't' values meant for significance of difference between means. The order of effectiveness of teaching

Table :4.57: Means of Total Creative Thinking Scores of Boys

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	3975	82.81	2.69^{NS}	1.04^{NS}	5.59^{**}
2. Lect.+ Discussion	4108	85.5		-1.65^{NS}	2.9^{NS}
3. Lect.+ Disc.+ Practicals	4025	83.85			1.55^{**}
4. Lect.+ Disc.+Pract. + A.V.Aids	4243	88.4			

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 *  Significant at 0.05 level
 ** Significant at 0.01 level
 NS Not Significant
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strategies in terms of total creative thinking scores of boys is Strategy IV, Strategy II, Strategy III and Strategy I with mean scores of 88.4, 85.5, 83.85 and 82.81 respectively. The 't' values given in Table 4.57 indicate that mean of total creative thinking scores of boys under St_4 is significantly higher than

those of st_3 and St_1 at 0.01 level, while it is not significantly higher than that of St_2, even at 0.05 level. While mean scores of St_1 , St_2 and St_3 are not significant when compared with each other. It is remarkable that addition of practical work in Strategy St_2 has no positive effect for developing creative thinking in the boys of experimental group.

Table :4.58: Summary of Originality Scores of Boys

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=264 N=12	St_2 Ex=301 N=12	St_3 Ex=291 N=12	St_4 Ex=322 N=12	$EG_1=$1178 N=48
II	St_2 Ex=332 N=12	St_3 Ex=313 N=12	St_4 Ex=350 N=12	St_1 Ex=296 N=12	$EG_2=$1291 N=48
III	St_3 Ex=277 N=12	St_4 Ex=308 N=12	St_1 Ex=260 N=12	St_2 Ex=288 N=12	$EG_3=$1133 N=48
IV	St_4 Ex=265 N=12	St_1 Ex=238 N=12	St_2 Ex=256 N=12	St_3 Ex=237 N=12	$EG_4=$996 N=48
Total Units	$EU_1=$1138 N=48	$EU_2=$1160 N=48	$EU_3=$1157 N=48	$EU_4=$1143 N=48	Grand Total 4598 N=192
Total Strategies	$ESt_1=1058$ N=48	$ESt_2=1177$ N=48	$ESt_3=1118$ N=48	$ESt_4=$ 1245 N=48	

E Stands for ' $\leq$ '

The above table provides the summary of results for the criterion variable scores of Originality of Thinking of the boys.

Based upon this set of data, summary of analysis of variance

on the lines of Latin Square Design is given in Table 4.59.

Table :4.59: Summary of ANOVA of Originality of Boys

Source of Variance	df	Ss	Ms	F ratio	Level of Signifi-cance
Treatments (Strategies)	3	400.85	133.62	5.7	.01
Columns (Units)	3	7.1	2.37	0.1	NS
Rows (Subjects)	47	26299.98	559.57	–	–
Sequence	3	930.6	310.02	0.5	NS
Error (a)	44	25369.38	576.58		
Residual Error (b)	138	3235.55	23.45	–	–
Total	191	29943.48	–	–	–

From the above table it is clear that the contribution

of treatments is significant at 0.01 level. Thus, the effect

of various strategies of teaching is found significant when

tested in terms of F ratio. The concerned F ratio is 5.7 for

df 3/138. This value is significant at 0.01 level. It means

that teaching strategies have differential effects upon the

originality scores of boys of seventh class.

In order to pin-point the relative effectiveness of teaching

strategies and also to know the direction of their efficiency,

means of originality scores of selected children under each strategy were compared. For this comparison L.S.D. Test was applied. Values calculated for level of significance at 0.05 and 0.01 level are 1.94 and 2.56 respectively. Table 4.60 gives such means for originality scores of boys, as well as 't' values meant for significance of difference between means.

Table :4.60: Means of Originality Scores of Boys

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	1058	22.04	2.48^*	1.25^{NS}	3.9^{**}
2. Lect.+ Discussion	1177	24.52		-1.23^{NS}	1.42^{NS}
3. Lect.+Disc.+ Practicals	1118	23.29			2.65^{**}
4. Lect.+Disc.+Pract.+ A.V. Aids	1245	25.94			

  * Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

The order of effectiveness of teaching strategies in terms of originality scores of boys in Strategy IV, Strategy II, Strategy III and Strategy I with mean scores of 25.94, 24.52, 23.29 and 22.04 respectively. The 't' values given in Table 4.60 indicate that mean of originality scores of boys under Strategy IV is significantly higher than those of St_1 and St_3 at 0.01 level, but it is not significantly higher than that of St_2. It is

also seen that the mean of St_2 is significantly higher than that of St_1 at 0.05 level, but St_3 has no positive superiority over St_1. It means that addition of practical work is not useful for increasing originality scores of boys.

Table :4.61: Summary of Flexibility Scores of Boys

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=284 N=12	St_2 Ex=286 N=12	St_3 Ex=302 N=12	St_4 Ex=319 N=12	EG_1=1191 N=48
II	St_2 Ex=330 N=12	St_3 Ex=320 N=12	St_4 Ex=345 N=12	St_1 Ex=323 N=12	EG_2=1318 N=48
III	St_3 Ex=294 N=12	St_4 Ex=313 N=12	St_1 Ex=304 N=12	St_2 Ex=303 N=12	EG_3=1214 N=48
IV	St_4 Ex=284 N=12	St_1 Ex=262 N=12	St_2 Ex=264 N=12	St_3 Ex=250 N=12	EG_4=1060 N=48
Total Units	EU_1=1192 N=48	EU_2=1181 N=48	EU_3=1215 N=48	EU_4=1195 N=48	Grand Total 4783 N=192
Total Strategies	ESt_1=1173 N=48	ESt_2=1183 N=48	ESt_3=1166 N=48	ESt_4=1261 N=48	

E Stands for 'Σ'

Above Table provides the summary of results for the criterion variable scores of Flexibility of Thinking of the boys. Based upon this set of data, summary of analysis of variance is given in Table 4.62.

Table :4.62: Summary of ANOVA of Flexibility of Boys

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	121.31	40.44	7.35	.01
Columns (Units)	3	12.56	4.19	0.76	NS
Rows (Subjects)	47	11552.25	245.79	–	–
Sequence	3	702.68	234.23		
				0.95	NS
Error (a)	44	10849.57	246.58		
Residual Error (b)	138	758.38	5.5	–	–
Total	191	12444.5			

It is clear from Table 4.62, that the treatments contribute significantly at 0.01 level. Thus, the effects of various strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio is 7.35 for df 3/138. This value is significant at 0.01 level. It means that teaching strategies have differential effects upon the flexibility scores of boys of seventh class.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency, means of flexibility scores of selected children under each strategy were compared. For this comparison Least Significance Difference Test was applied. Values calculated for level of

significance at 0.05 level = 0.95 and at 0.01 level = 1.25.

Table :4.63: Means of Flexibility Scores of Boys

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture/	1173	24.44	0.21^{NS}	-0.15^{NS}	1.83^{**}
2. Lect.+Discussion	1183	24.65		-0.36^{NS}	1.62^{**}
3. Lect.+Disc.+ Practicals	1166	24.29			1.98^{**}
4. Lect.+Disc.+ Pract.+A.V.Aids	1261	26.27			

 * Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

Table 4.63 above gives such means for flexibility scores of boys as well as 't' values meant for significance of difference, between means.

The order of effectiveness of teaching strategies in terms of flexibility scores of boys is Strategy IV, Strategy II, Strategy I and Strategy III, with mean scores of 26.27, 24.65, 24.44 and 24.29 respectively. The 't' values given in Table 4.63 indicate that mean of flexibility scores of boys under strategy IV is significantly higher than those of all other strategies at 0.01 level. While mean scores of St_1 , St_2 and St_3 are not significant when compared to each other. It is remarkable that addition of practical work in lecture and discussion has no positive effect for developing flexibility of thinking in boys of the experimental group.

Table :4.64: Summary of Fluency Scores of Boys

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 $Ex=425$ $N=12$	St_2 $Ex=397$ $N=12$	St_3 $Ex=420$ $N=12$	St_4 $Ex=438$ $N=12$	$EG_1=1680$ $N=48$
II	St_2 $Ex=473$ $N=12$	St_3 $Ex=488$ $N=12$	St_4 $Ex=477$ $N=12$	St_1 $Ex=470$ $N=12$	$EG_2=1908$ $N=48$
III	St_3 $Ex=441$ $N=12$	St_4 $Ex=421$ $N=12$	St_1 $Ex=444$ $N=12$	St_2 $Ex=463$ $N=12$	$EG_3=1769$ $N=48$
IV	St_4 $Ex=401$ $N=12$	St_1 $Ex=405$ $N=12$	St_2 $Ex=415$ $N=12$	St_3 $Ex=392$ $N=12$	$EG_4=1613$ $N=48$
Total Units	$EU_1=1740$ $N=48$	$EU_2=1711$ $N=48$	$EU_3=1756$ $N=48$	$EU_4=1763$ $N=48$	Grand Total 6970 $N=192$
Total Stra-tegies	$ESt_1=1744$ $N=48$	$ESt_2=1748$ $N=48$	$ESt_3=1741$ $N=48$	$ESt_4=1737$ $N=48$	

E Stands for ' Σ '

Table 4.64 provides the summary of results for criterion variable scores of Fluency of Thinking of the boys. Based upon this set of data summary of analysis of variance on the lines of Latin Square Design is given in Table 4.65.

Table :4.65: Summary of ANOVA of Fluency of Boys

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	1.35	0.45	0.03	NS
Columns (Units)	3	33.35	11.12	0.6	NS
Rows (Subjects)	47	27575.98	586.72	-	-
Sequence	3	1016.02	338.67	0.56	NS
Error (a)	44	26559.96	603.64		
Residual Error (b)	138	2569.8	18.62	-	-
Total	191	30180.48	-	-	-

Looking at the Table 4.65 it becomes evident that the contribution of treatments is not significant even at 0.05 level. Thus, the effect of selected strategies of teaching is not found significant when examined in terms of F ratio. The concerned F ratio is 0.03 for df = 3/54. This is not significant at 0.05 level. It means that the selected strategies of teaching have no differential effect upon the fluency scores of seventh class boys.

Table 4.66 provides the summary of results for criterion variable scores of Total Creative Thinking of the girls. Based

Table :4.66: Summary of Total Creative Thinking of Scores of Girls

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=393 N=5	St_2 Ex=405 N=5	St_3 Ex=397 N=5	St_4 Ex=415 N=5	EG_1= 1610 N=20
II	St_2 Ex=319 N=5	St_3 Ex=311 N=5	St_4 Ex=352 N=5	St_1 Ex=325 N=5	EG_2= 1307 N=20
III	St_3 Ex=227 N=5	St_4 Ex=233 N=5	St_1 Ex=236 N=5	St_2 Ex=241 N=5	EG_3= 937 N=20
IV	St_4 Ex=336 N=5	St_1 Ex=318 N=5	St_2 Ex=323 N=5	St_3 Ex=343 N=5	EG_4= 1320 N=20
Total Units	EU_1=1275 N=29	EU_2=1267 N=20	EU_3=1308 N=20	EU_4=1324 N=20	Grand Total 5174 N=80
Total Strategies	ESt_1=1272 N=20	ESt_2=1288 N=20	ESt_3=1278 N=20	ESt_4=1336 N=20	

E Stands for ' $\leq$ '

upon this set of data summary of analysis of variance on the lines of the Latin Square Design is given in Table 4.67 on the next page.

Looking at the Table 4.67 it becomes evident that the contribution of treatments is not significant at 0.05 or 0.01 level. Thus the effect of various strategies of teaching is not

Table :4.67: Summary of ANOVA of the Total Creative
Thinking of Girls

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	126.95	42.32	1.19	NS
Columns (Units)	3	109.25	36.42	0.73	NS
Rows (Subjects)	19	46912.55	2469.08	-	-
Sequence	3	11407.45	3802.48	1.71	NS
Error (a)	16	35505.1	2219.1		
Residual Error (b)	54	2708.8	50.16	-	-
Total	79	49857.55	-	-	-

found significant when examined in terms of F ratio. The concerned
F ratio is 1.19 for df 3/54. This is not significant at 0.05
level. It means that the selected strategies of teaching have
no differential effect upon the total creative thinking scores
of seventh class girls.

Table 4.68 provides the summary of results for criterion
variable scores of Originality of the girls. Based upon this
set of data summary of analysis of variance on the lines of
the Latin Square Design is given in Table 4.69.

Table :4.68: Summary of Originality Scores of Girls

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=116 N=5	St_2 Ex=117 N=5	St_3 Ex=107 N=5	St_4 Ex=105 N=5	$EG_1=445$ N=20
II	St_2 Ex=86 N=5	St_3 Ex=78 N=5	St_4 Ex=88 N=5	St_1 Ex=102 N=5	$EG_2=354$ N=20
III	St_3 Ex=54 N=5	St_4 Ex=53 N=5	St_1 Ex=60 N=5	St_2 Ex=52 N=5	$EG_3=219$ N=20
IV	St_4 Ex=76 N=5	St_1 Ex=84 N=5	St_2 Ex=73 N=5	St_3 Ex=83 N=5	$EG_4=316$ N=20
Total Units	$EU_1=332$ N=20	$EU_2=332$ N=20	$EU_3=328$ N=20	$EU_4=342$ N=20	Grand Total 1334 N=80
Total Strategies	$ESt_1=362$ N=20	$ESt_2=328$ N=20	$ESt_3=322$ N=20	$ESt_4=322$ N=20	

E Stands for ' $\leq$ '

Table :4.69:   Summary of ANOVA of Originality of Girls

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	55.35	18.45	1.24	NS
Columns (Units)	3	5.35	1.78	0.12	NS
Rows (Subjects)	19	5590.05	294.21	–	–
Sequence	3	1313.45	437.82	1.64	NS
Error (a)	16	4276.6	267.29		
Residual Error (b)	54	800.8	14.83	–	
Total	79	6451.55	–	–	–

Looking to Table 4.69, it is clear that the contribution

of treatments is not significant even at 0.05 level. Thus the

effect of various strategies of teaching is not found significant

when examined in terms of F ratio. The concerned F ratio is

1.24 for df 3/54. This is not significant at 0.05 level. It

means that the selected strategies of teaching have no

differential effects upon the originality scores of girls of

seventh class.

Table 4.70 provides the summary of results for the

criterion variable scores of Flexibility of Thinking of the

Table :4.70: Summary of Flexibility Scores of Girls

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=117 N=5	St_2 Ex=118 N=5	St_3 Ex=112 N=5	St_4 Ex=137 N=5	$EG_1=$ 484 N=20
II	St_2 Ex=99 N=5	St_3 Ex=97 N=5	St_4 Ex=106 N=5	St_1 Ex=99 N=5	$EG_2=$ 401 N=20
III	St_3 Ex=67 N=5	St_4 Ex=78 N=5	St_1 Ex=75 N=5	St_2 Ex=74 N=5·	$EG_3=$ 294 N=20
IV	St_4 Ex=111 N=5	St_1 Ex=92 N=5	St_2 Ex=100 N=5	St_3 Ex=99 N=5	$EG_4=$ 402 N=20
Total Units	$EU_1=394$ N=20	$EU_2=385$ N=20	$EU_3=393$ N=20	$EU_4=409$ N=20	Grand Total 1581 N=80
Total Strategies	$ESt_1=383$ N=20	$ESt_2=391$ N=20	$ESt_3=375$ N=20	$ESt_4=432$ N=20	

E Stands for ' $\leqslant$ '

girls. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.71 on the next page.

Table :4.71L Summary of ANOVA of Flexibility of
Girls

Source of Variance	df	Ss	MS	F ratio	Level of Significance
Treatments (Strategies)	3	96.46	32.15	4.94	.01
Columns (Units)	3	15.05	5.02	0.77	NS
Rows (Subjects)	19	3609.25	189.96	–	–
Sequence	3	910.35	303.45		
Error (a)	16	2898.9	168.68	1.8	NS
Residual Error (b)	54	351.75	6.51	–	–
Total	79	4072.5	–	–	–

It is clear from the above table, that the treatments
contribute significantly at 0.01 level. Thus, the effect of
various strategies of teaching is found significant when
tested in terms of F ratio. The concerned F ratio is 4.94 for
df 3/54. This value is significant at 0.01 level. It means
that teaching strategies have differential effects upon the
flexibility scores of girls of seventh class.

In order to pin-point the relative effectiveness of
teaching strategies and also to know the direction of this
efficiency, means of flexibility scores of selected children
under each strategy were compared. For this comparison L.S.D.
Test was applied. Values calculated forlevel of significance

at 0.05 and 0.01 level are 1.61 and 2.14 respectively.

Table below gives such means for flexibility scores of girls

as well as 't' values meant for significance of difference

between means.

Table :4.72: Means of Flexibility Scores of
              Girls

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	383	19.15	0.4^{NS}	-0.4^{NS}	2.45^{**}
2. Lect. + Discussion	391	19.55		-0.8^{NS}	2.05^{*}
3. Lect. + Disc.+Practicals	375	18.75			2.85^{**}
4. Lect.+Disc.+Pract.+ A.V. Aids	432	21.60			

* Significant at 0.05 level
** Significant at 0.01 level
NS Not Significant

The order of effectiveness of teaching strategies in

terms of flexibility scores of girls is Strategy IV, Strategy II,

Strategy I and Strategy III with mean scores of 21.6, 19.55, 19.15

and 18.75 respectively. The 't' values given in the table indicate

that mean of flexibility scores of girls under Strategy IV is

significantly higher than those of St_1 and St_3 at 0.01 level

and that of St_2 at 0.05 level. When compared to each other

mean scores of St_1, St_2 and St_3 are not significant even at

0.05 level. It is remarkable that addition of practical work

in lecture and discussion has no positive effect for

developing flexibility of thinking in girls of seventh class. Though St_2 has somewhat positive effect on St_1, it is not significant.

Table :4.73: Summary of Fluency Scores of Girls

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=160 N=5	St_2 Ex=170 N=5	St_3 Ex=158 N=5	St_4 Ex=173 N=5	EG_1=661 N=20
II	St_2 Ex=134 N=5	St_3 Ex=136 N=5	St_4 Ex=158 N=5	St_1 Ex=124 N=5	EG_2=552 N=20
III	St_3 Ex=106 N=5	St_4 Ex=102 N=5	St_1 Ex=101 N=5	St_2 Ex=115 N=5	EG_3=424 N=20
IV	St_4 Ex=149 N=5	St_1 Ex=142 N=5	St_2 Ex=150 N=5	St_3 Ex=161 N=5	EG_4=602 N=20
Total Units	EU_1=549 N=20	EU_2=550 N=20	EU_3=567 N=20	EU_4=573 N=20	Grand Total 2239 N=80
Total Strategies	ESt_1=527 N=20	ESt_2=569 N=20	ESt_3=561 N=20	ESt_4=582 N=20	

E Stands for '$\leq$'

Table 4.73 above provides the summary of results for criterion variable scores of Fluency of Thinking of the girls.

Based upon this set of data summary of analysis of variance on the lines of Latin Square Design is given in Table 4.74.

Table :4.74: Summary of ANOVA of Fluency of Girls

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	82.75	27.58	1.72	NS
Columns (Subjects)	3	21.95	7.32	0.46	NS
Rows (Subjects)	19	7566.25	398.22	–	–
Sequence	3	1526.25	508.75	1.35	NS
Error (a)	16	6040.00	377.5		
Residual Error (b)	54	864.05	16	–	–
Total	79	8535			

From the above Table 4.74, it iss seen that the treatments do not contribute significantly, even at 0.05 level. Thus, the effect of various strategies of teaching is not found significant when tested in terms of F ratio. The concerned F ratio is 1.72 for df 3/54. This is not significant at 0.05 level. It means that selected strategies of teaching have no differential effect upon the fluency scores of the girls of seventh class.

Table :4.75: Summary of Total Creative Thinking Scores of High Creative Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=520 N=5	St_2 Ex=561 N=5	St_3 Ex=581 N=5	St_4 Ex=601 N=5	$EG_1=2263$ N=20
II	St_2 Ex=624 N=5	St_3 Ex=610 N=5	St_4 Ex=627 N=5	St_1 Ex=571 N=5	$EG_2=2432$ N=20
III	St_3 Ex=547 N=5	St_4 Ex=537 N=5	St_1 Ex=509 N=5	St_2 Ex=540 N=5	$EG_3=2133$ N=20
IV	St_4 Ex=492 N=5	St_1 Ex=464 N=5	St_2 Ex=490 N=5	St_3 Ex=492 N=5	$EG_4=1938$ N=20
Total Units	$EU_1=2183$ N=20	$EU_2=2172$ N=20	$EU_3=2207$ N=20	$EU_4=2204$ N=20	Grand Total 8766 N=80
Total Strategies	$ESt_1=2064$ N=20	$ESt_2=2215$ N=20	$ESt_3=2230$ N=20	$ESt_4=2257$ N=20	

'E' stands o for '$\leq$ '

The above Table 4.75 provides the summary of results for the criterion variable scores of Total Creative Thinking of the high creative pupils. Based upon this set of data, summafy of analysis of variance on the lines of the Latin Square Design is given in Table 4.76.

Table :4.76: Summary of ANOVA of the Total Creative
Thinking of the High Creative Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	1129.05	376.35	10.67	.01
Columns (Units)	3	42.45	14.15	0.4	NS
Rows (Subjects)	19	21587.05	1136.16	-	-
Sequence	3	6531.85	2177.28	2.3	NS
Error (a)	16	15055.2	940.95		
Residual Error (b)	54	1905.00	35.28	-	-
Total	75	24663.55	-	-	-

From the above table, it is clear that the treatments contribute significantly at 0.01 level. Thus, the effect of various strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio happens to be 10.67 for df 3/54. This value is significant at 0.05 level. It means that teaching strategies have differential effect upon total creative thinking scores of highly creative pupils of seventh class.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency means of creative thinking scores of selected children under each strategy were compared. For this comparison L.S.D.

Test was applied. Values calculated for level of significance at 0.05 level = 3.78 and at 0.01 level = 5.04.

Table :4.77: Means of Total Creative Thinking Scores of High Creative Pupils

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	2064	103.20	7.55**	8.3**	9.65**
2. Lect.+Discussion	2215	110.75		0.75^{NS}	2.10 ^{NS}
3. Lect.+Disc.+ Practicals	2230	111.50			1.35^{NS}
4. Lect.+Disc.+Pract.+ A.V. aids	2257	112.85			

   * Significant at 0.05 level
  ** Significant at 0.01 level
NS Not Significant

Table 4.77 gives such means for total creative thinking scores of high creative pupils, as well as the 't' values meant for significance of difference between means.

The order of effectiveness of teaching strategies in terms of total creative thinking scores is Strategy IV, Strategy III, Strategy II and Strategy I with mean scores of 112.85, 111.50, 110.75 and 103.2 respectively. The 't' values given in Table 4.77 indicate that mean of total creative thinking scores of high creative pupils under St_4, St_3 and St_2 are significantly higher than that of St_1 at 0.01 level. It is also clear from the table that St_4 is not significantly more effective than St_2 and St_3 , though it has more positive effects on total creative

thinking scores of high creative pupils than St_2 and St_3 has.
It is also seen that St_3 and St_2 are almost similarly effective.

Table :4.78:   Summary of Originality Scores of High
Creative Thinking Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=141 N=5	St_2 Ex=176 N=5	St_3 Ex=187 N=5	St_4 Ex=186 N=5	$EG_1=690$ N=20
II	St_2 Ex=201 N=5	St_3 Ex=192 N=5	St_4 Ex=211 N=5	St_1 Ex=154 N=5	$EG_2=758$ N=20
III	St_3 Ex=157 N=5	St_4 Ex=157 N=5	St_1 Ex=141 N=5	St_2 Ex=146 N=5	$EG_3=601$ N=20
IV	St_4 Ex=156 N=5	St_1 Ex=133 N=5	St_2 Ex=140 N=5	St_3 Ex=153 N=5	$EG_4=582$ N=20
Total Units	$EU_1=655$ N=20	$EU_2=658$ N=20	$EU_3=679$ N=20	$EU_4=639$ N=20	Grand Total 2631 N=80
Total Strategies	$ESt_1=569$ N=20	$ESt_2=663$ N=20	$ESt_3=689$ N=20	$ESt_4=710$ N=20	

$E = \angle$

Table 4.78 provides the summary of results for the criterion
variable scores of Originality of Thinking of the high creative
group. Based upon this set of data, summary of analysis of
variance on the lines of Latin Square Design is given in Table 4.79.

Table :4.79: Summary of ANOVA of Originality of High
Creative Thinking Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	580.54	193.81	8.42	.01
Columns (Units)	3	40.54	13.51	0.59	NS
Rows (Subjects)	19	4807.74	-	-	-
Sequence	3	1002.44	334.15	1.4	NS
Error (a)	16	3805.3	237.83		
Residual Error (b)	54	1243.17	23.02	-	-
Total	79	6671.99	-	-	-

It is clear from Table 4.79 that the contribution of treatments is significant at 0.01 level. Thus, the effect of various selected strategies of teaching is found significant when tested in terms of F ratio. The concerned F ratio is 8.42 for df 3/54. This value is significant at 0.01 level. It implies that teaching strategies have differential effect upon the originality scores of seventh class pupils, having high creativity.

In order to understand the relative effectiveness of teaching strategies and also to know the direction of their efficiency, means of originality scores of the selected pupils

under each strategy were compared. For this comparison L.S.D.

Test was applied. Values calculated for level of significance at

0.05 level = 3.02 and at 0.01 level = 4.02.

Table 4.80 gives such means for originality scores of

high creative group as well as 't' values meant for significance

of difference between means. The order of effectiveness of

teaching strategies in terms of originality scores of high

creative group is Strategy IV, Strategy III, Strategy II and

Strategy I, with mean scores of 35.5, 34.45, 33.15 and 28.45

respectively. The 't' values given in Table 4.80 indicate that

Table :4.80: Means of Originality Scores of High
Creative Pupils

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	569	28.45	4.7^{**}	6.0^{**}	7.05^{**}
2. Lect. + Discussion	663	33.15		1.3^{NS}	2.35^{NS}
3. Lect.+ Disc.+ Practicals	689	34.45			1.05^{NS}
4. Lect. + Disc.+Pract. + A.V.Aids	710	35.5			

* Significance at 0.05 level
** Significance at 0.01 level
NS Not Significant

mean of originality scores of high creative group under St_4 is

significantly higher than that of St_1 at 0.01 level while it is

not significantly higher than those of St_2 and St_3. It is also

indicated that mean under St_3 is significantly higher than that of St_1 at 0.01 level, but St_3 is not significantly superior to St_2. It is also clear from the table that St_4 is not significantly more effective than St_2 and St_3, though it has more positive effects on originality scores of high creative group than St_2 and St_3 has. In short, it can be concluded from the table that merely lecturing is not effective for increasing originality of thinking in high creative group.

Table :4.81: Summary of Flexibility Scores of High Creative Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=154 N=5	St_2 Ex=161 N=5	St_3 Ex=163 N=5	St_4 Ex=174 N=5	EG_1= 652 N=20
II	St_2 Ex=174 N=5	St_3 Ex=165 N=5	St_4 Ex=173 N=5	St_1 Ex=170 N=5	EG_2= 682 N=20
III	St_3 Ex=151 N=5	St_4 Ex=160 N=5	St_1 Ex=144 N=5	St_2 Ex=154 N=5	EG_3= 609 N=20
IV	St_4 Ex=145 N=5	St_1 Ex=131 N=5	St_2 Ex=133 N=5	St_3 Ex=128 N=5	EG_4= 537 N=20
Total Units	EU_1=624 N=20	EU_2=617 N=20	EU_3=613 N=20	EU_4=626 N=20	Grand Total 2480 N=80
Total Strategies	ESt_1=599 N=20	ESt_2=622 N=20	ESt_3=607 N=20	ESt_4=652 N=20	

E Stands for '$\leq$'

Table 4.81 provides the summary of results for the criterion variable scores of Flexibility of Thinking of the high creative group. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.82.

Table :4.82: Summary of ANOVA of Flexibility of High Creative Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	81.9	27.3	4.42	.01
Columns (Units)	3	5.5	1.83	0.3	NS
Rows (Subjects)	19	1721.0	90.58	–	–
Sequence	3	593.9	197.97	2.81	NS
Error (a)	16	1227.1	70.44		
Residual Error (b)	54	333.6	6.18		
Total	79	2142.0			

From the above table it is clear that the treatments contribute significantly at 0.01 level. Thus, the effect of various selected strategies of teaching is found significant when examined in terms of F ratio. The concerned F ratio is 4.42 for df 3/54. This value is significant at 0.01 level. It means that teaching strategies have differential effect upon flexibility scores of highly creative pupils of seventh class.

In order to pin-point the relative effectiveness of teaching strategies and also to know the direction of their efficiency, means of flexibility scores of selected pupils under each strategy were compared. For this comparison L.S.D. test was applied. Values calculated for level of significance at 0.05 and 0.01 level are 1.57 and 2.09 respectively.

Table :4.83: Means of Flexibility Scores of High Creative Pupils

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	599	29.95	1.15^{NS}	0.3^{NS}	2.65^{**}
2. Lect. + Discussion	622	31.1		-0.85^{NS}	1.5^{NS}
3. Lect.+Disc.+Practicals	607	30.35			2.25^{**}
4. Lect.+Disc.+ Pract.+ A.V.Aids	652	32.6			

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 *   Significant at .05 level
 **  Significant at .01 level
 NS  Not Significant
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Table 4.83 gives such means of flexibility scores of high creative group as well as the 't' values meant for significance of difference between means.

The order of effectiveness of teaching strategies in terms of flexibility of high creative group is Strategy IV, Strategy II, Strategy III and Strategy I with mean scores of 32.6, 31.1, 30.35 and 29.95 respectively. The 't' values given in Table 4.83 above indicate that the mean of flexibility

scores of high creative group under Strategy IV is significantly

higher than those of St_3 and St_1 at 0.01 level, while it is not

significantly higher than that of St_2 , even at 0.05 level.

While mean scores of St_1 , St_2 and St_3 are not significant when

compared with each other. It is remarkable that addition of

practical work in Strategy II has no positive effects for develop-

ing flexibility of thinking in the high creative pupils of

experimental group.

Table :4.84: Summary of Fluency Scores of High Creative Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=225 N=5	St_2 Ex=230 N=5	St_3 Ex=225 N=5	St_4 Ex=241 N=5	EG_1= 921 N=20
II	St_2 Ex=249 N=5	St_3 Ex=253 N=5	St_4 Ex=243 N=5	St_1 Ex=247 N=5	EG_2= 992 N=20
III	St_3 Ex=239 N=5	St_4 Ex=220 N=5	St_1 Ex=224 N=5	St_2 Ex=240 N=5	EG_3= 923 N=20
IV	St_4 Ex=191 N=5	St_1 Ex=200 N=5	St_2 Ex=217 N=5	St_3 Ex=211 N=5	EG_4= 819 N=20
Total Units	EU_1=904 N=20	EU_2=903 N=20	EU_3=909 N=20	EU_4=939 N=20	Grand Total 3655 N=80
Total Strate- gies	ESt_1= 896 N=20	ESt_2=936 N=20	ESt_3=928 N=20	ESt_4=895 N=20	

E Stands for 'Σ'

The above table provides the summary of results for criterion

variable scores of Fluency of Thinking of the high creative group.

Based upon this set of data summary of analysis of variance

on the lines of Latin Square Design is given in Table 4.85.

Table :4.85: Summary of ANOVA of Fluency of High Creative

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	68.25	22.75	1.97	NS
Columns (Units)	3	43.55	14.52	1.26	NS
Rows (Subjects)	19	3186.95	167.73	–	–
Sequence	3	761.95	253.98	0.13	NS
Error (a)	16	31105.00	1944.06		
Residual Error (b)	54	624.45	11.56	–	–
Total	79	3923.2	–	–	–

Looking at the above table, it is clear that the treatments

do not contribute significantly even at 0.05 level. Thus, the

effect of various strategies of teaching is not found significant

when tested in terms of F ratio. The concerned F ratio is 1.97

for df 3/54. This is not significant at 0.05 level. It means

that selected strategies of teaching have no differential effect

upon the fluency scores of seventh class pupils having high

creative thinking.

Table 4.86 provides the summary of results for criterion

variable scores of Total Creative Thinking of the low creative

pupils. Based upon this set of data summary of analysis of variance

Table :4.86: Summary of Total Creative Thinking Scores of
Low Creative Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=294 N=5	St_2 Ex=285 N=5	St_3 Ex=266 N=5	St_4 Ex=285 N=5	$EG_1=$ 1130 N=20
II	St_2 Ex=253 N=5	St_3 Ex=212 N=5	St_4 Ex=299 N=5	St_1 Ex=230 N=5	$EG_2=$ 994 N=20
III	St_3 Ex=234 N=5)	St_4 Ex=254 N=5)	St_1 Ex=259 N=5)	St_2 Ex=250 N=5	$EG_3=$ 997 N=20
IV	St_4 Ex=238 N=5	St_1 Ex=216 N=5	St_2 Ex=231 N=5	St_3 Ex=230 N=5	$EG_4=$ 915 N=20
Total Units	$EU_1=1019$ N=20	$EU_2=967$ N=20	$EU_3=1055$ N=20	$EU_4=995$ N=20	Grand Total 4036 N=80
Total Strategies	$ESt_1=999$ N=20	$ESt_2=1019$ N=20	$ESt_3=942$ N=20	$ESt_4=1076$ N=20	

on the lines of the Latin Square Design is given in Table 4.87.

Looking at Table 4.87, it is clear that the contribution of treatments is not significant at 0.01 or 0.05 level. Thus, the effect of various selected strategies of teaching is not found significant when tested in terms of F ratio. The concerned F ratio is 2.58 for df 3/54. This is not significant at 0.05 level.

Table :4.87: Summary of ANOVA of the Total Creative
Thinking of the Low Creative Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	458.9	152.97	2.58	NS
Columns (Units)	3	208.8	69.6	1.17	NS
Rows (Subjects)	19	29401.13	1547.44	–	–
Sequence	3	1192.3	397.43	0.23	NS
Error (a)	16	28209.0	1763.06		
Residual Error (b)	54	3198.8	59.24	–	–
Total	79	33267.8	–	–	–

NS   Not Significant

It means that the selected strategies of teaching have no differential effects upon the total creative thinking scores of low creative pupils of seventh class.

Table :4.88: Summary of Originality Scores of Low
Creative Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=82 N=5	St_2 Ex=74 N=5	St_3 Ex=69 N=5	St_4 Ex=69 N=5	EG_1=294 N=20
II	St_2 Ex=68 N=5	St_3 Ex=45 N=5	St_4 Ex=55 N=5	St_1 Ex=54 N=5	EG_2=222 N=20
III	St_3 Ex=55 N=5	St_4 Ex=61 N=5	St_1 Ex=65 N=5	St_2 Ex=57 N=5	EG_3=238 N=20
IV	St_4 Ex=40 N=5	St_1 Ex=50 N=5	St_2 Ex=46 N=5	St_3 Ex=44 N=5	EG_4=180 N=20
Total Units	EU_1=245 N=20	EU_2=230 N=20	EU_3=235 N=20	EU_4=224 N=20	Grand Total 934 N=80
Total Strategies	ESt_1=251 N=20	ESt_2=245 N=20	ESt_3=213 N=20	ESt_4=225 N=20	

E Stands for ' $\leq$ '

Table 4.88 above provides the summary of results for criterion variable scores of Originality of thinking of low creative pupils. Based upon this set of data summary of analysis of variance on

the lines of the Latin Square Design is given in Table 4.89.

Table :4.89: Summary of ANOVA of Originality of Low
Creative Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	46.55	15.52	1.17	NS
Columns (Units)	3	11.85	3.95	0.3	NS
Rows (Subjects)	19	2745.05	144.48	–	–
Sequence	3	333.75	111.25	0.74	NS
Error (a)	16	2411.3	150.71		
Residual Error (b)	54	714.1	13.22		
Total	79	3517.55			

It is clear from Table 4.89 that the contribution of treatments is not significant even at 0.05 level. Thus, the effect of various strategies of teaching is not found significant when tested in terms of F ratio. The concerned F ratio is 1.17 for df 3/54. This is not significant at 0.05 level. It means that the selected strategies of teaching have no differential effect upon the originality scores of seventh class pupils having low creative thinking.

Table :4.90: Summary of Flexibility Scores of Low Creative
Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=83 N=5	St_2 Ex=85 N=5	St_3 Ex=85 N=5	St_4 Ex=94 N=5	$EG_1=347$ N=20
II	St_2 Ex=80 N=5	St_3 Ex=72 N=5	St_4 Ex=103 N=5	St_1 Ex=76 N=5	$EG_2=331$ N=20
III	St_3 Ex=71 N=5	St_4 Ex=82 N=5	St_1 Ex=82 N=5	St_2 Ex=75 N=5	$EG_3=310$ N=20
IV	St_4 Ex=91 N=5	St_1 Ex=66 N=5	St_2 Ex=75 N=5	St_3 Ex=72 N=5	$EG_4=304$ N=20
Total Units	$EU_1=325$ N=20	$EU_2=305$ N=20	$EU_3=345$ N=20	$EU_4=317$ N=20	Grand Total 1292 N=80
Total Strategies	$ESt_1=307$ N=20	$ESt_2=315$ N=20	$ESt_3=300$ N=20	$ESt_4=370$ N=20	

E Stands for ' $\leq$ '

Table 4.90 above provides the summary of results for the criterion variable scores of Flexibility of Thinking of the low creative group. Based upon this set of data, summary of analysis of variance on the lines of Latin Square Design is given in Table 4.91.

Table :4.91: Summary of ANOVA of Flexibility of Low
Creative Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	152.9	50.97	8.55	.01
Columns (Units)	3	42.4	14.13	2.37	-
Rows (Subjects)	19	2569.2	135.22	-	-
Sequence	3	58.5	19.5		
				0.13	NS
Error (a)	16	2510.7	156.92		
Residual Error (b)	54	321.7	5.96	-	-
Total	79	3086.2	-	-	-

It is clear from the above Table 4.91 that the contribution of treatments is significant at 0.01 level. Thus, the effect of various selected strategies of teaching is found significant when tested in terms of F ratio. The concerned F ratio is 8.55 for df 3/54. This value is significant at 0.01 level. It implies that teaching strategies have differential effect upon the flexibility scores of seventh class pupils, having low creativity.

In order to understand the relative effectiveness of teaching strategies and also to know the direction of their efficiency, means of flexibility scores of the selected pupils

under each strategy were compared. For the comparison

L.S.D. Test was applied. Values calculated for level of

significance at 0.05 level = 1.55 and at 0.01 level = 2.06.

Table :4.92: Mean of Flexibility Scores of Low Creative
Pupils

Treatments	Total Scores	Mean	St_2	St_3	St_4
1. Lecture	307	15.35	0.4^{NS}	-0.35^{NS}	3.15^{**}
2. Lect.+ Discussion	315	15.75		0.75^{NS}	2.75^{**}
3. Lect. + Disc. + Practicals	300	15.00			3.5^{**}
4. Lect. + Disc. + Pract. + A.V. Aids	370	18.5			

 *   Significant at 0.05 level
 ** Significant at 0.01 level
 NS Not Significant

Table 4.92 gives such means for flexibility scores of low

creative group as well as 't' values meant for significance

of difference between means. The order of effectiveness of

teaching strategies in terms of flexibility scores of low

creative group is Strategy IV, Strategy II, Strategy I and

Strategy III with mean scores of 18.5, 15.75, 15.35 and 15.00

respectively. The 't' values given in Table 4.92 indicate that

mean of flexibility scores of low creative group under St_4 is

significantly higher than those of St_1 , St_2 and St_3 at 0.01

level. When compared to each mean scores of St_1, St_2 and St_3

are not significant even at 0.05 level.

It is remarkable that adding of practical work in lecture and discussion has no positive effect for developing flexibility of thinking in low creative group of this experiment.

Table :4.93: Summary of Fluency Scores of Low Creative Pupils

Group	Unit 1 Teacher 1	Unit 2 Teacher 2	Unit 3 Teacher 3	Unit 4 Teacher 4	Total
I	St_1 Ex=129 N=5	St_2 Ex=126 N=5	St_3 Ex=112 N=5	St_4 Ex=122 N=5	$EG_1=$ 489 N=20
II	St_2 Ex=105 N=5	St_3 Ex=95 N=5	St_4 Ex=141 N=5	St_1 Ex=100 N=5	$EG_2=$ 441 N=20
III	St_3 Ex=108 N=5	St_4 Ex=111 N=5	St_1 Ex=112 N=5	St_2 Ex=118 N=5	$EG_3=$ 449 N=20
IV	St_4 Ex=107 N=5	St_1 Ex=100 N=5	St_2 Ex=110 N=5	St_3 Ex=114 N=5	$EG_4=$ 431 N=20
Total Units	$EU_1=449$ N=20	$EU_2=432$ N=20	$EU_3=475$ N=20	$EU_4=454$ N=20	Grand Total 1810 N=80
Total Strategies	$ESt_1=$ 449 N=20	$ESt_2=459$ N=20	$ESt_3=429$ N=20	$ESt_4=481$ N=20	

The above table provides the summary of results for criterion variable scores of Fluency of Thinking of the low creative group. Based upon this set of data summary of analysis of Variance on the lines of Latin Square Design is given in Table 4.94 on the next page.

Table :4.94: Summary of ANOVA of Fluency of Low Creative
Pupils

Source of Variance	df	Ss	Ms	F ratio	Level of Significance
Treatments (Strategies)	3	76.95	25.65	1.6	NS
Columns (Units)	3	47.05	15.68	0.98	NS
Rows (Subjects)	19	5449.75	286.83	-	
Sequence	3	96.95	32.32	0.12	NS
Error (a)	16	5352.8	334.55		
Residual Error (b)	54	867.00	16.06	-	-
Total	79	6440.75	-	-	-

From the above table, it is clear that the contribution of
treatments is not significant even at 0.05 level. Thus, the
effect of various strategies of teaching is not found significant
when examined in terms of F ratio. The concerned F ratio is 1.6
for df 3/54. This is not significant at 0.05 level. It means
that selected strategies of teaching have no differential effect
for increasing the fluency scores of seventh class pupils having
low creative thinking.

Fig. 4.3 GRAPH SHOWING THE EFFECTS OF STRATEGIES ON THE
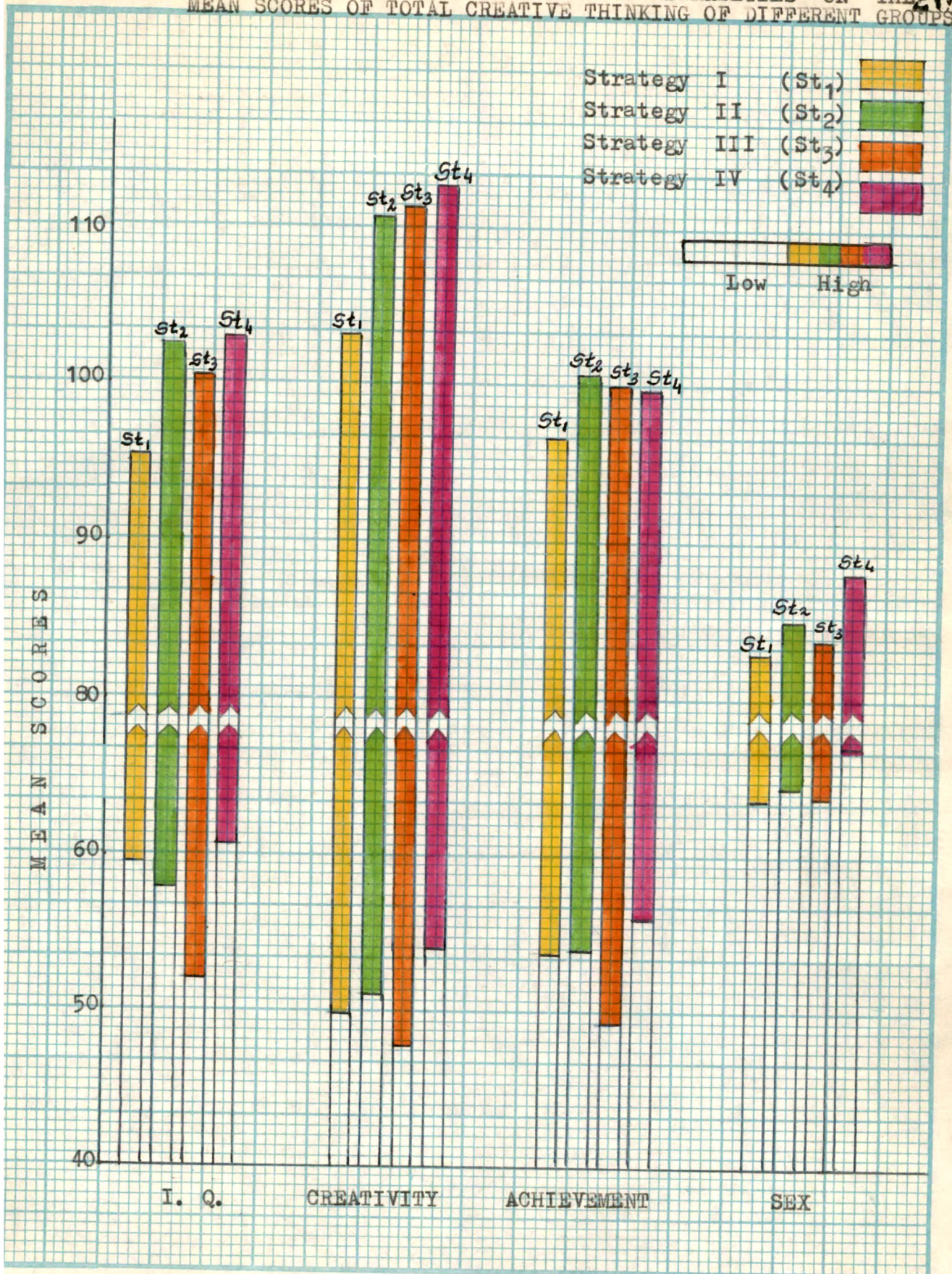MEAN SCORES OF TOTAL CREATIVE THINKING OF DIFFERENT GROUPS

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Fig. 4.4   GRAPH SHOWING THE EFFECTS OF STRATEGIES ON THE
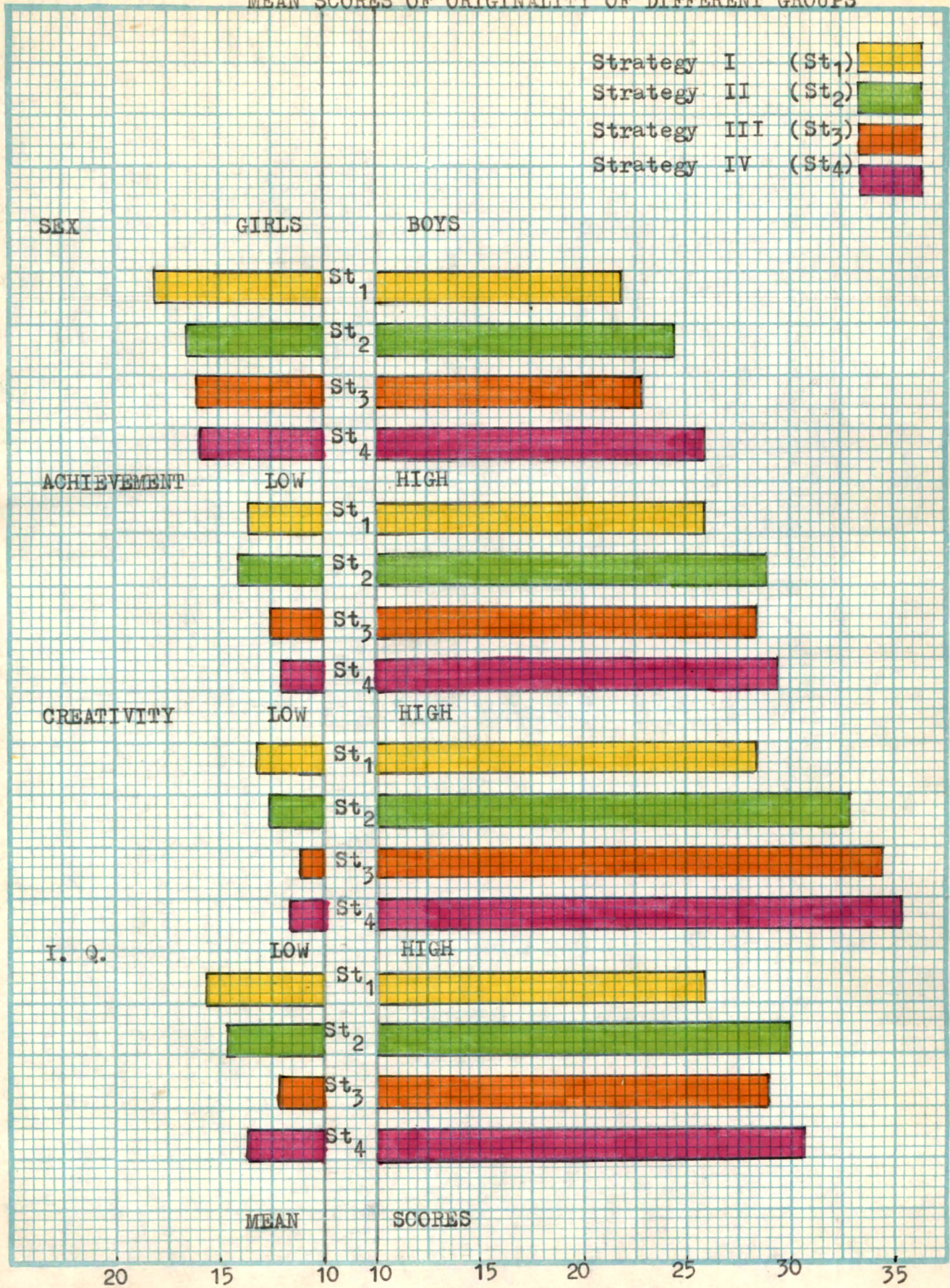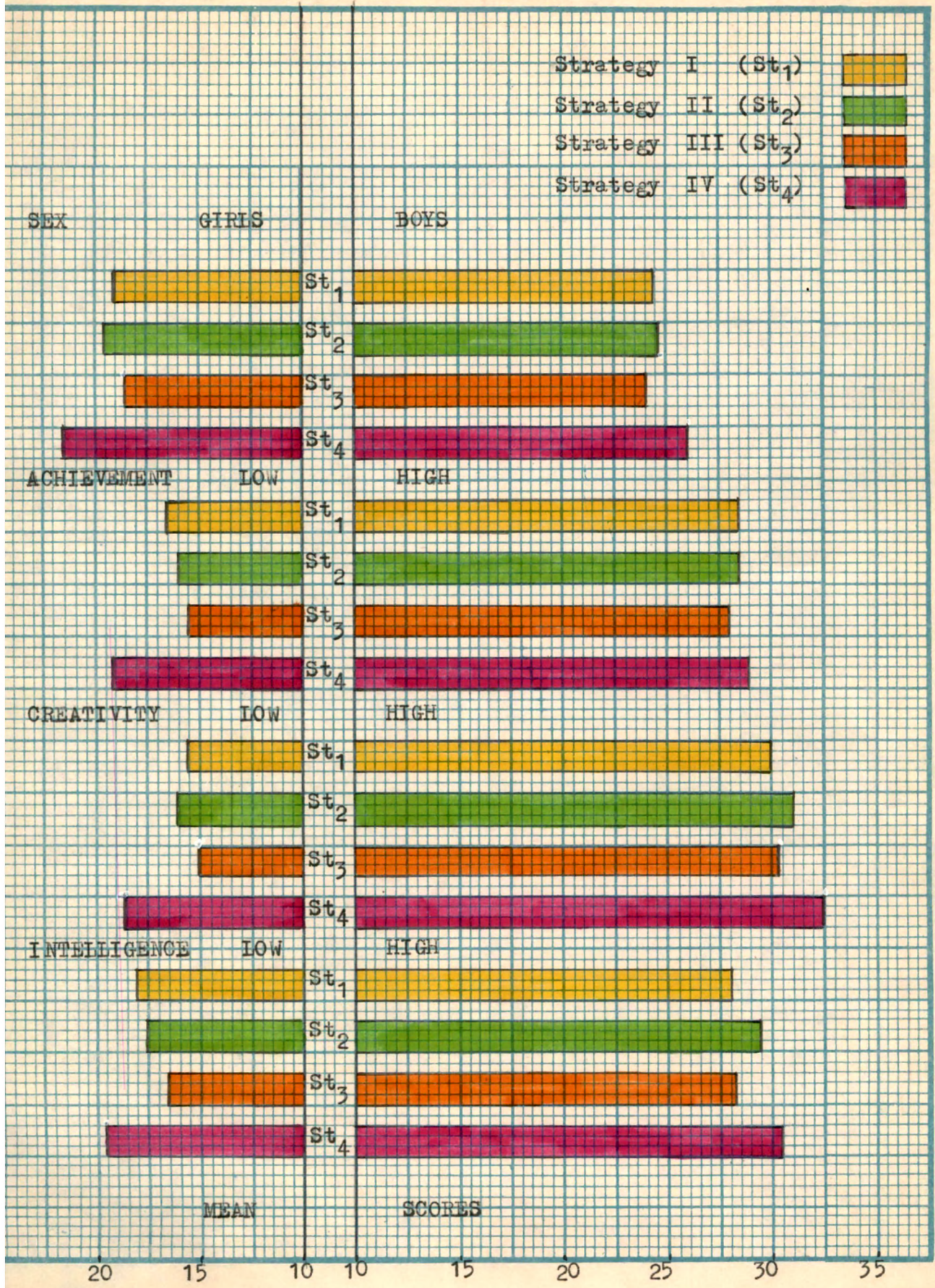MEAN SCORES OF ORIGINALITY OF DIFFERENT GROUPS

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Strategy I   (St₁)
Strategy II   (St₂)
Strategy III   (St₃)
Strategy IV   (St₄)

Fig. 4.5   GRAPH SHOWING THE EFFECTS OF STRATEGIES ON THE MEAN SCORES OF FLEXIBILITY OF DIFFERENT GROUPS
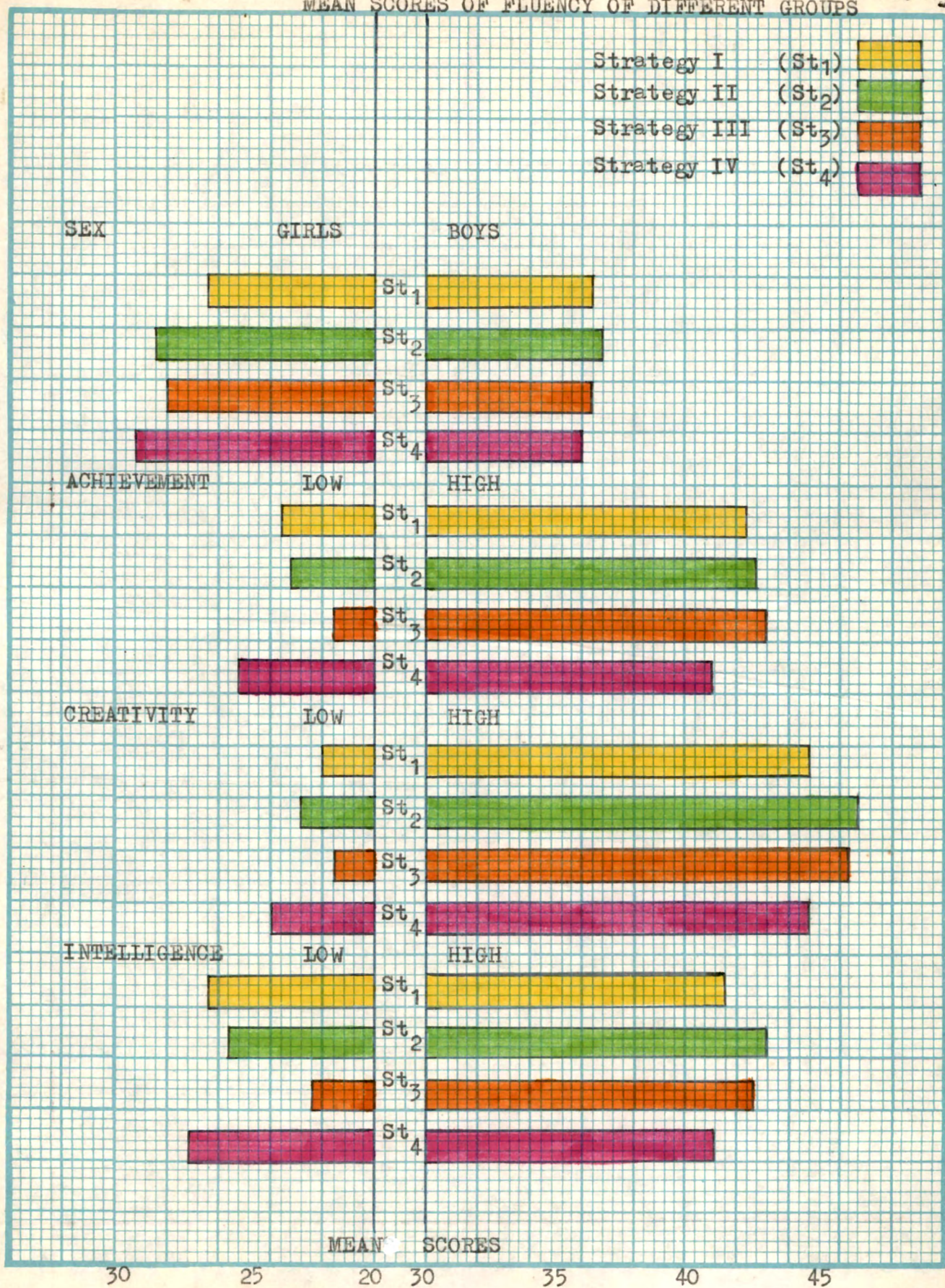
Fig. 4.6 GRAPH SHOWING THE EFFECT OF STRATEGIES ON THE MEAN SCORES OF FLUENCY OF DIFFERENT GROUPS

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In the present chapter the analysis and interpretation
of the data obtained as a result of the experiment performed
on the lines of Latin Square Design, were done The chapter
that follows i.e. Chapter five will provide the detailed
discussion of these results and the conclusions deduced from
them in the light of the hypotheses evolved earlier.