CHAPTER IV

ANALYSIS AND INTERPRETATION OF RESULTS

4.0.0. INTRODUCTION

As mentioned in earlier chapter III, the study was conducted into two phases: First phase (pilot study) and Second phase (final study), in order to achieve three objectives : One in pilot study and two in final study. In order to achieve the objectives of the final study, hypotheses detailed below, were tested.

This chapter deals with the analysis of data related to phase two (final study) under two stages : Laboratory Stage and School Stage to achieve objectives II and III respectively. The results have been presented under two major captions 4.1.0 and 4.2.0. The data related to laboratory stage were analysed by employing

analysis of variance and Covariance, results are reported under caption 4.1.0. The data collected at school stage were analysed by employing analysis of covariance. The statistical interpretations of the results have been given after each stage under captions 4.1.0 and 4.2.0.

4.1.0. Laboratory Stage (Training)

Although the analysis of data could be restricted in terms of total scores of the skills only yet for better understanding and deeper analysis, the component-wise analysis have also been done. The three way analysis of variance 3 X 4 X 2 (Treatments - three techniques of providing feedback, Lessons - teach cycle 1, reteach cycle 1, teach cycle 2 and reteach cycle 2 per skill, and observer - peer and self) has been employed for the data of first two skills i.e. Body Movement and Gestures (refer Winer, 1971, p.539-49). Analysis of variance has also been employed for the skill componentwise data of first two skills mentioned above.

For the third skill, shifting sensory channels, the two way analysis of variance 3 X 4 (Treatments - three techniques of providing feedback and Lessons - teach cycle 1,

reteach cycle 1, teach cycle 2 and reteach cycle 2 per skill) has been employed for the results of this skill.

The results for testing the hypotheses are given below in Table 4.1 to 4.15 in the following manner :

Tables 4.1 to 4.6 deal with skill of total body movement (Skill I BMT) Tables 4.1 A, B and C deal with total score on total body movement (Skill I BMT) and Tables 4.2 to 4.6 deal with the components of skill of body movement (Skill I M_1 to M_5).

Tables 4.7 to 4.13 deal with skill of total gestures (Skill II GT). Tables 4.7A, B and C deal with total score on total gestures (Skill I GT) and Tables 4.8 to 4.13 deal with the components of skill of gestures (Skill II G_1 to G_6).

Tables 4.14 and 4.15 deal with skill of shifting sensory challels (Skill III). Tables 4.14 A, B and C deal with the total record of events on the skill. Tables 4.15 A, B and C deal with the total shifts in the events.

Tables 4.16 A, B and C deal with covariates: achievement and pretest on GTCOS and criterian variable (Scores on

attitude scale) Tables 4.17 A, B and C deal with covariates: achievement and pretest on GTCOS and criterian variable (scores on self evaluation).

4.1.1. Skill of Body Movement (Skill I - BMT)

Results related to the skill of body movement total and its components are reported as under to test the following three hypotheses :

H_1 - There is no differential effect of three different techniques of peer feedback - discussion, oral and written, upon the attainment of the skill of body movement.

H_2 - There is no practice effect of lessons upon the attainment of the skill of body movement.

H_3 - Peer and Self do not differ in their rating of the performance for the skill of body movement.

Table 4.1 A includes the raw score data for the skill of Body Movement (Skill I - BMT). The data in a factorial design (3 X 4 X 2) have been presented treatmentwise, lessonwise and observerwise. The data were subjected to ANOVA on the lines of Winer (1971, p.539 - 49). The F-ratio for the variation due to feedback treatment happens to be 23.45 for df 2/21. This value is significant at 0.01 level. This indicates that the feedback treatment

TABLE 4.1 A :

Basic Data in Terms of Raw Scores for Skill of Body Movement

(Skill I - BMT)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	20	21	28	27	32	30	32	31
	17	24	26	28	28	32	30	33
Discussion	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
(E_1)	18	27	26	25	30	33	31	33
Sum =	151	185	207	213	222	224	243	246
	9	15	15	23	27	20	26	23
	11	20	19	23	15	21	27	27
Oral	.	.	.	.	.	.	.	.
(E_2)	.	.	.	.	.	.	.	.
	18	29	20	29	25	28	24	26
Sum =	93	172	145	186	150	170	215	201
	16	19	21	22	27	23	24	27
	21	23	24	26	27	27	25	28
	.	.	.	.	.	.	.	.
Written	.	.	.	.	.	.	.	.
(E_3)	25	27	28	25	29	29	25	29
Sum =	172	207	207	204	220	220	212	227

TABLE 4.1 B :

Summary of ANOVA Results for Skill of Body Movement (Skill I-BMT)

Source of Variation	SS	df	MV	F
Between subjects	1832.00	23	79.65	
Feedback Treatment (T)	1265.28	2	632.64	23.45 **
Subj. W groups (Error (T))	566.72	21	26.98	
Within subjects	3375.25	168	20.09	
Lesson (L)	1410.41	3	470.13	61.53 **
Feedback Treatment X Lesson (T x L)	254.68	6	42.44	5.55 **
L X Subj. W groups (Error (L))	481.89	63	7.64	
Observer (O)	247.52	1	247.52	78.57 **
Feedback Treatment X Observer (T X O)	66.70	2	33.35	10.58 **
O X Subj. W groups (Error (O))	66.18	21	3.15	
Lesson X Observer (L X O)	259.57	3	86.52	11.78 **
Feedback Treatment X Lesson X Observer (T X L X O)	125.09	6	20.84	2.83 *
L X O X Subj. W groups (Error(L X O))	462.84	63	7.34	

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

TABLE 4.1 C :

M, SD and 't' Values for Skill of Body Movement for (Skill I-BMT) Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-value
E_1	Discussion	64	26.42	4.43	
E_2	Oral	64	20.81	5.50	$E_1-E_2 = 6.28^{**}$
E_3	Written	64	26.07	3.33	$E_1-E_3 = 0.50^{NS}$ $E_2-E_3 = 6.45^{**}$

** Significant at 0.01 level
NS Not Significant

has produced differential effect upon the attainment of teaching skill of Body Movement (Skill I - BMT). Hence, the hypothesis H_1 'There is no differential effect of three different techniques of peer feedback - discussion, oral and written, upon the attainment of teaching skill of Body Movement (Skill I - BMT)' is rejected. In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.1 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores happens to be 6.28 between groups E_1 and E_2, significant at 0.01 level ; 0.50 between groups E_1 and E_3 and not significant; and 6.45

between groups E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that discussion feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be discussion, written and oral feedback. Hence treatments have shown differential effect when seen in terms of Body Movement (Skill I - BMT).

The F-ratio of 61.53 for df 3/63 related to lesson variation, happens to be significant at 0.01 level. This indicates the difference, in the acquisition of body movement skill from lesson to lesson. Hence the hypothesis H_2, " There is no practice effect of lessons upon the attainment of teaching skill of Body Movement (Skill I-BMT)," is rejected. The simple interaction of (first order) feedback treatment X lesson is significant at 0.01 level (F = 5.55, df = 6/63, table 4.1 B). This means that a particular type of treatment when coupled with a particular level of lesson has produced significantly higher score than any other combination (S) due to feedback treatment and lesson. The experimental condition due to discussion feedback in lesson four is having the highest score (sum total=489) mean of 30.5 whereas the mean of 19.5 (sum total = 265) for the experimental condition oral feedback at lesson one is the lowest.

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The rating by peer supervisor (observer) and self have differed significantly at 0.01 level for the skill of body movement (F = 78.57, df = 1/21, Table 4.1 B). The analysis of raw scores given in Table 4.1 A indicates that the self has rated higher than the peer supervisor. Hence the hypothesis H_3, ' Peer and self do not differ in their rating of the performance for the skill of Body movement (Skill I - BMT)', is rejected. The simple interaction due to feedback treatment X observer (F = 10.58, df = 2/21 Table 4.1 B) and lesson X observer (F = 11.78, df = 3/63, Table 4.1 B) are significant at 0.01 level. This means that at a particular experimental condition due to feedback treatment and observer, namely, discussion feedback etc. and self rating study produdes the highest score (sum total = 868) while for the condition of oral feedback and peer rating (sum total = 603) is the lowest. In the case of lesson and observer interaction, in lesson four, self rating represents the higher score (sum total = 674) and in lesson one peer rating has the lowest score (sum total = 416). The interaction of (second order) feedback treatment X lesson X observer is significant at 0.05 level (F = 2.83, df = 6/63, Table 4.1 B). This means that a particular type of treatment when coupled with

particular level of lesson and particular observer has produced significantly higher scores than any other combination (S) due to feedback treatment, lesson and observer. The experimental condition due to discussion feedback in lesson four rated by self is having the highest score (sum total = 246) whereas the condition of oral feedback in lesson one and rated by peer supervisor (sum total = 93) is the lowest.

It may be noted that the hypotheses have been tested for the total score for the skill of Body Movement (Skill BMT). Nevertheless, the analysis in terms of ANOVA has been done for the five component skills of the skill of Body Movement (Skill I-BMT). These analyses have been done for the purposes of better understanding and new exploration. These five component skills are : (i) moving towards blackboard to discuss diagram and content written on it; (ii) moving towards individual pupil to examine his work; (iii) moving towards the class when talking to them; (iv) moving sideways to adjust aids / ask questions / explain / attend the students; and (v) moving between the rows and around the class to control / check / show the material / distribute the material / help the group of students. The ANOVA results are given in Tables 4.2 to 4.6.

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TABLE 4.2 A :

Basic Data in Terms of Raw Scores for Skill of Body Movement (Skill I M_1) - (Moving Towards Black Board to Discuss Diagram and Content Written on it)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
Discussion (E_1)	6	6	6	6	6	6	6	6
	4	6	5	6	6	7	6	7
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	5	5	5	6	7	6	7
Sum =	36	44	42	45	46	48	50	52
Oral (E_2)	2	3	3	5	5	4	6	5
	2	5	4	5	3	4	6	5
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	6	4	6	4	6	5	6
Sum =	22	32	29	37	32	35	44	41
Written (E_3)	5	4	4	4	6	4	5	6
	4	5	5	5	6	6	6	6
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	5	5	6	5	6	6	6	6
Sum =	36	42	42	40	46	44	46	47

TABLE 4.2 B :

Summary of ANOVA Results for Skill of Body Movement (Skill I M_1) (Moving towards Blackboard to discuss Diagram and Content Written on it)

Source of Variation	SS	df	MV	F
Between Subjects	105.82	23	4.600	
Feedback Treatment (T)	71.47	2	35.735	21.85 **
Subj w groups (Error (T))	34.35	21	1.635	
Within Subjects	134.50	168	0.801	
Lesson (L)	51.02	3	17.007	44.40 **
Feedback Treatment X Lesson (T X L)	5.33	6	0.888	2.31 *
L X Subj W groups (Error (L))	24.15	63	0.383	
Observer (O)	6.75	1	6.750	7.96 *
Feedback Treatment X Observer (T X O)	1.97	2	0.985	1.16 NS
O X Subj W groups (Error (O))	17.78	21	0.847	
Lesson X Observer (L X O)	7.13	3	2.377	8.83 **
Feedback Treatment X Lesson X Observer (T X L X O)	3.4	6	0.567	2.10 NS
L X O X Subj W groups (Error (L X O)	16.97	63	0.269	

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

TABLE 4.2 C :

M, SD and 't' Values for Skill of Body Movement (Skill I M_1) (Moving towards Blackboard to discuss Diagram and Content written on it) for Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-value
E_1	Discussion	64	5.67	0.88	$E_1-E_2=8.05^{**}$
E_2	Oral	64	4.25	1.10	$E_1-E_2=2.06^{*}$
E_3	Written	64	5.35	0.87	$E_2-E_3=6.24^{**}$

** Significant at 0.01 level
* Significant at 0.05 level

(a) Body Movement (Skill I M_1) :
(Moving towards Blackboard to discuss Diagram and Content written on it)

Table 4.2 A includes the raw score data for the component skill of ' moving towards blackboard (Skill I M_1). The data have been presented treatmentwise, lessonwise and observerwise (3 X 4 X 2). The data were subjected to ANOVA on the lines of Winer (1971, p.539-49) given under Table 4.2 B. The F-ratio for the variation due to feedback treatment happens to be 21.85 for df 2/21. This value is significant at 0.01 level. It indicates that the feedback treatment has produced the differential effect upon the statement of component skill of M_1 ' moving towards blackboard '(Skill I M_1) of body movement. In order to pinpoint the direction and

amount of mean differences between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.1 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores for the component skill of 'moving towards black board' (Skill I M_1) of body movement, happens to be 8.05 between groups E_1 and E_2, significant at 0.01 level; 2.06 between groups E_1 and E_3, not significant; and 6.24 between groups E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that discussion feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be discussion, written and oral feedback. Hence treatments have shown differential effect when seen in terms of component skill of 'moving towards blackboard (Skill I M_1) of body movement.

The F-ratio of 44.40 for df 3/63 related to lesson variation, happens to be significant at 0.01 level. It indicates that the difference in the acquisition of the component skill of 'moving towards blackboard' (Skill I M_1) of body movement from lesson to lesson exists. The simple interaction of feedback treatment X lesson is significant at

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at 0.05 level (F = 2.30, df = 6/63). This means that a particular type of treatment when coupled with a particular level of lesson has produced significantly higher scores than any other combination(S) due to feedback treatment and lesson. The experimental condition due to discussion feedback in lesson four is having the highest score (sum total = 102) whereas the condition of oral feedback in lesson one is the lowest (sum total = 54).

Rating by peer supervisors and self have differed significantly at 0.01 level for the component skill M_1 (F = 7.96, df = 1/21). The analysis of raw scores given in Table 4.2 A indicates that self has rated higher (sum total = 189) than the peer supervisor (sum total = 127). The simple interaction due to feedback treatment X observer (F = 1.16, df = 2/21) is not significant. Interaction due to lesson X observer is significant at 0.01 level (F = 8.83, df = 2/63). This means that a particular condition due to lesson and observer produces highest score than any other combination(S) due to lesson and observer. The experimental condition to lesson three and rated by self is having the highest score (sum total = 127) whereas the condition of lesson one and rated by peer (sum total = 94) is the lowest. This interaction of (second order) feedback treatment X lesson X observer is not significant. This shows no combination among feedback treatment, lesson and observer could produce highest score.

TABLE 4.3 A :

Basic Data in Terms of Raw Scores for one Skill of Body Movement (Skill I M_2) (Moving towards Individual Pupil to examine his work)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
Discussion (E_1)	3	4	6	6	7	7	7	7
	3	1	5	5	5	6	6	7
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	6	6	4	6	6	7	6
Sum =	25	31	41	41	45	46	49	51
Oral (E_2)	2	3	4	5	6	4	6	4
	2	5	4	5	3	5	5	5
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	6	4	6	5	5	5	6
Sum =	18	35	31	41	31	37	44	39
Written (E_3)	2	4	5	5	5	5	6	5
	4	4	5	5	6	5	5	6
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	5	6	6	5	6	6	4	6
Sum =	34	44	44	43	44	44	44	47

TABLE 4.3 B :

Summary of ANOVA Results for Skill of Body Movement (Skill I M_2) (Moving towards Individual Pupil to examine his Work)

Source of Variation	SS	df	MV	F
Between Subjects	76.00	23	3.30	
Feedback Treatment (T)	39.88	2	19.94	11.59 **
Subj.w groups (Error(T))	36.12	21	1.72	
Within Subjects	244.37	168	1.45	
Lesson (L)	83.01	3	27.67	35.47 **
Feedback Treatment X Lesson (T X L)	19.29	6	3.21	4.12 **
L X Subj. w groups (Error (L)	49.57	63	0.78	
Observer (O)	12.51	1	12.51	14.55 **
Feedback Treatment X Observer (T X O)	3.26	2	1.63	1.90 NS
O X Subj. w groups (Error (O))	18.10	21	0.86	
Lesson X Observer (L X O)	12.89	3	4.29	7.40 **
Feedback Treatment X Lesson X Observer (T X L X O)	8.90	6	1.48	2.55 *
L X O X Subj w groups (Error (L X O))	36.84	63	0.58	

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

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TABLE 4.3 C :

M, SD and 't' values for Skill of Body Movement (Skill I M_2) (Moving towards Individual Pupil to examine his Work) for Three Groups E_1 X E_2 and E_3

Groups	Feedback	N	M	SD	t-values
E_1	Discussion	64	5.14	1.39	E_1-E_2 = 3.49 **
E_2	Oral	64	4.31	1.29	E_1-E_2 = 1.10 NS
E_3	Written	64	5.37	0.92	E_2-E_3 = 5.33 **

** Significant at 0.01 level
NS Not Significant

(b) Body Movement (Skill I M_2) (Moving towards Individual Pupil to examine his Work)

Table 4.3 A includes the raw score data for the component skill of 'moving towards individual pupil to examine his work (Skill I M_2) of body movement. The data have been presented treatmentwise, lessonwise, and observerwise (3 X 4 X 2). The data were subjected to ANOVA on the lines of Winer (1971, p.539-49). The F-ratio for the variation due to feedback treatment happens to be 11.59 for df 2/21. This value is significant at 0.01 level. It indicates that the feedback treatment has produced the differential effects upon the attainment of component skill (Skill I M_2) of body movement. In order to pinpoint the direction and amount

of mean difference between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.3 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores for the component skill (Skill I M_2) of body movement happens to be 3.49 between groups E_1 and E_2, significant at 0.01 level; 1.10 between groups E_1 and E_3, not significant; and 5.33 between groups E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that written feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be written, discussion and oral feedback. Hence treatments have shown differential effect when seen in terms of component skill (Skill I M_2) of body movement.

The F-ratio 35.47 for df 3/63 related to lesson variation, happens to be significant at 0.01 level. It indicates that there is difference in the acquisition of component skill (Skill I M_2) of body movement from lesson to lesson. The simple interaction of (first order) feedback treatment X lesson is significant at 0.01 level ($F = 4.12$, df = 6/63, Table 4.3 B). This means that a particular type of feedback treatment when coupled with a particular level of lesson has produced significantly higher scores than any other

combination(S) due to feedback treatment and lesson. The experimental condition due to discussion feedback in lesson four is having the highest score (sum total = 100) whereas the condition of oral feedback in lesson one is the lowest.

Rating by peer supervisor and self have differed significantly at 0.01 level for the component skill (Skill I M_2) of body movement (F = 14.55, df = 1/21, Table 4.3 B). The analysis of raw scores given in the Table 4.3 A indicates that the self rated higher (sum total = 169) than the peer supervisor (sum total = 124). The simple interaction due to feedback treatment X observer (F = 1.90, df = 2/21 Table 4.3 B) is not significant. Interaction due to lesson X observer is significant at 0.01 level (F = 7.40, df = 3/63 , Table 4.3 B). This means that a particular condition due to lesson and observer produces higher score than any other combination (S) due to lesson and observer. The experimental condition due to lesson four and rated by self is having the highest score (sum total = 137) whereas the condition of lesson one and rated by peer supervisor (sum total = 77) is the lowest. The interaction of (second order) feedback treatment X lesson X observer is significant at 0.05 level (F = 2.55, df = 6/63, Table 4.3 B). This means that a particular type of feedback treatment when coupled with

particular level of lesson and particular observer has produced significantly higher score than any other combination(s) due to feedback treatment, lesson and observer. The experimental condition due to discussion feedback in lesson four rated by self is having the highest score(sum total = 51) whereas the condition of oral feedback, lesson one and rated by peer supervisor (sum total = 18) is the lowest.

(C) Body Movement (Skill I M_3) :
(Moving Towards Class when Talking to them)

Table 4.4 A includes the raw score data for the component skill of 'moving towards the class when talking to them', (Skill I M_3) of body movement. The data have been presented treatmentwise, lessonwise and observerwise (3 X 4 X 2). The data were subjected to ANOVA on the lines of Winer (1971, p.534). The F-ratio for the variation due to feedback treatment happens to be 12.10 for df/21. This value is significant at 0.01 level. It indicates that the feedback treatment has produced the differential effect upon the development of component skill of 'moving towards the class when talking to them' (Skill I M_3) of body movement. In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and

TABLE 4.4 A :

Basic Data in Terms of Raw Scores for Skill of Body Movement (Skill I M_3) (Moving Towards Class when Talking to them)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	3	5	5	5	6	6	7	7
	3	5	6	6	6	6	6	6
Discussion (E_1)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	3	5	5	5	6	7	6	7
Sum =	29	37	43	45	44	44	52	49
	1	3	2	4	5	5	4	5
	2	6	4	4	2	4	5	6
Oral (E_2)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	3	6	4	6	5	6	6	6
Sum =	16	37	28	38	28	36	45	42
	3	4	3	4	5	5	4	5
	5	3	5	6	5	5	4	5
Written (E_3)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	5	6	5	6	6	5	6
Sum =	33	39	40	41	44	43	38	43

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50 TABLE 4.4 B :

Summary of ANOVA Results for Skill of Body Movement (M_3) (Moving Towards Class when Talking to them)

Source of Variation	SS	df	MV	F
Between Subjects	81.98	23	3.56	
Feedback Treatment (T)	43.82	2	21.91	12.10 **
Subj. w groupa (Error (T))	38.16	21	1.81	
Within subjects	214.50	168	1.27	
Lesson (L)	64.56	3	21.52	34.16 **
Feedback Treatment X Lesson (T X L)	19.97	6	3.32	5.27 **
L X Subj. w groups (Error (L))	39.97	63	0.63	
Obsefver (O)	15.18	1	15.18	25.73 **
Feedback Treatment X Observer (T X O)	7.73	2	3.86	6.54 **
O X Subj. w groups (Error(O))	12.59	21	0.59	
Lesson X Observer (L X O)	14.90	3	4.96	10.33 **
Feedback Treatment X Lesson X Observer (T X L X O)	9.32	6	1.55	3.23 **
L X O Subj. w groups (Error (L X O))	30.28	63	0.48	

** Significant at 0.01 level
* Significant at 0.05 level

TABLE 4.4 C :

M, SD and 't' Values for Skill of Body Movement (Skill I M_3) (Moving Towards the Class when Talking to Them) for Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-values
E_1	Discussion	64	5.35	1.16	E_1-E_2 = 4.95 **
E_2	Oral	64	4.21	1.43	E_1-E_2 = 1.87 NS
E_3	Written	64	5.01	0.86	E_2-E_3 = 3.83 **

** Significant at 0.01 level
NS Not significant

E_3, the significance of difference between means was also employed. Table 4.4 C shows the mean scores, SD and t values for three groups. The t values between the mean scores for the component skill (Skill I M_3) of body movement happens to be 4.95 between groups E_1 and E_2, significant at 0.01 level; 1.87 between groups E_1 and E_3, not significant; and 3.83 between E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that discussion feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of three treatments happens to be discussion, written and oral feedback. Hence treatments have shown differential effect when seen in terms of component skill (Skill I M_3) of body movement.

The F-ratio 34.16 for df 3/63 related to lesson variation happens to be significant at 0.01 level. It indicates that there is difference in the acquisition of component skill of 'moving towards the class when talking to them' (Skill I M_3)

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of body movement from lesson to lesson.

The simple interaction of (1st order) feedback treatment X lesson is significant at 0.01 level (F = 5.27, df = 6/63). This means that a particular type of feedback treatment when coupled with a particular level of lesson, has produced significantly higher scores than any other combination(S) due to feedback treatment and lesson. The experimental condition due to discussion feedback in lesson four is having the highest score (sum total = 101) whereas the condition of oral feedback in lesson first is the lowest (sum total = 53).

Rating by peer supervisor and self have differed significantly at 0.01 level for the component skill of ' moving towards the class when talking to them ' (Skill I M_3) of body movement (F = 25.73, df = 1/21). The analysis of raw scores given in the table 4.4 A indicates that self has rated higher (sum total = 175) than the peer supervisor (sum total = 117). The simple interaction due to feedback treatment X Observer (F = 6.54, df = 2/21) is significant at 0.01 level. This means that a particular condition due to feedback treatment and observer produces highest scores than any other combination (S) due to feedback and observer. The experimental condition due to

discussion feedback rated by self is having the highest score (sum total = 175) whereas the condition of oral feedback rated by peer supervisor (sum total = 117) is the lowest.

Interaction due to lesson and observer is significant at 0.01 level (F = 10.33, df = 3/63). This means that a particular condition due to lesson and observer produces highest scores than any other combination (s) due to lesson and observer. The experimental condition due to lesson four and rated by peer supervisor is having the highest score (sum total = 135) whereas the condition of lesson one rated by peer supervisor (sum total = 78) is the lowest. The interaction of (second order) feedback treatment X lesson X observer is significant at 0.01 level (F = 3.23, df = 6/63). This means that a particular type of feedback treatment when coupled with particular level of lesson and particular observer has produced significantly higher scores than any other combination(s) due to feedback, lesson and observer. The experimental condition due to discussion feedback in lesson four rated by self is having the highest score (sum total = 49) whereas the condition of oral feedback, lesson first and rated by peer supervisor (sum total = 16) is the lowest.

(d) Body Movement (Skill I M_4)
(Moving Sideways) to adjust Aids/Ask Questions/ Explain/Attend the Students)

TABLE 4.5 A :
Basic Data in Terms of Raw Scores for Skill of Body Movement (Skill I M_4) (Moving Sideways to adjust Aids/Ask Questions/ Explain/Attend the Students)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
Discussion (E_1)	3	3	5	5	6	6	7	5
	4	6	5	5	6	7	6	7
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	3	6	4	6	6	6	6	6
Sum =	30	36	41	40	43	44	46	47
Oral (E_2)	1	3	2	5	5	3	4	4
	2	5	3	4	3	4	5	5
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	3	5	4	6	6	6	4	4
Sum =	15	28	26	35	29	30	39	38
Written (E_3)	3	3	4	4	5	4	4	5
	4	5	5	5	5	6	4	6
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	6	5	5	5	5	5	5	5
Sum =	37	37	40	38	41	44	40	44

TABLE 4.5 B :

Summary of ANOVA Results for Skill of Body Movement (Skill I M_4) (Moving Sideways to adjust Aids/Ask Questions/Explain/Attend the Students)

Source of Variation	SS	df	MV	F
Between subjects	108.75	23	4.73	
Feedback Treatment (T)	73.78	2	36.89	22.16 **
Subj. w groups (Error (T))	34.97	21	1.67	
Within subjects	202.25	168	1.20	
Lesson (L)	54.79	3	18.26	20.99 **
Feedback Treatment X Lesson (T X L)	11.68	6	1.95	2.24 NS
L X Subj. w groups (Error(L))	54.78	63	0.87	
Observer (O)	6.02	1	6.02	6.64 *
Feedback Treatment X Observer (T X O)	2.70	2	1.35	1.49 NS
O X Subj. w groups (Error(O))	19.03	21	0.91	
Lesson X Observer (L X O)	3.1	3	1.03	1.55 NS
Feedback Treatment X Lesson X Observer (T X L X O)	8.18	6	1.36	2.05 NS
L X O Subj. w groups (Error (L X O))	41.97	63	0.67	

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

TABLE 4.5 C :

M, SD and 't' Values for Skill of Body Movement (Skill I M_4) (Moving Sideways to adjust Aids/Ask Questions/Explain/Attend the students) for Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-Values		
E_1	Discussion	64	5.10	1.06	E_1-E_2=	7.65	**
E_2	Oral	64	3.75	0.93	E_1-E_3=	0.53	NS
E_3	Written	64	5.01	0.83	E_2-E_3	8.06	**

** Significant at 0.01 level
NS Not Significant

Table 4.5 A includes the raw score data for the component skill of ' moving sideways to adjust aids/ask question / attend the students ' (Skill I M_4) of body movement. The data have been presented treatmentwise, lessonwise and observerwise (3 X 4 X 2). The data were subjected to ANOVA on the lines of Winer (1971, p.539). Feedback treatments have differed significantly at 0.01 level for the component skill of ' moving sideways to adjust aids / ask question / explain / attend the students ' (Skill I M_4) of body movement ($F = 22.16$, $df = 2/21$). In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and E_3. The significance of difference between means was also employed. Table 4.5 C shows

the mean scores, SD and t-values for three groups. The t-values between the mean scores for the component skill (Skill I M_4) of body movement happens to be 7.65 between groups E_1 and E_2, significant at 0.01 level ; 0.53 between groups E_1 and E_3, not significant, and 8.06 between E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that discussion feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be discussion, written and oral feedback. Hence treatments have shown differential effect when seen in terms of component skill (Skill I M_4) of body movement.

The F-ratio 20.99 for df 3/63 related to lesson variation, happens to be significant at 0.01 level. It indicates that there is difference in the acquisition of component skill of 'moving sideways to adjust aids / ask question / explain / attend the students ' (Skill I M_4) of body movement from lesson to lesson. The simple interaction of (first order) feedback treatment X lesson is not significant (F = 2.24, df = 6/63).

Rating by peer supervisor and self rating have differed significantly at 0.05 level for the component skill of 'moving sideways to adjust aids / ask question / explain /

attend the students ' (Skill I M_4) of body movement (F = 6.64, df = 1/21). The analysis of raw scores given in the Table 4.5 A shows that the self has rated higher (sum total = 167) than the peer supervisor (sum total = 109). The simple interaction due to feedback treatment X observer (F = 1.49, df = 2/21) is not significant. Interaction due to lesson and observer (F = 1.55, df = 3/63) is not significant. The interaction of (second order) feedback treatment X lesson X observer (F = 2.05, df = 6/63) is not significant.

(e) Body Movement (Skill I M_5)
(Moving Between the Rows and Around the Class to control / check / show the material / distribute the material / help the Group of Students).

Table 4.6 A includes the raw scores data for the component skill of ' moving between the rows and around the class to control / check / show / distribute / help the group of students ' (Skill I M_5) of body movement. The data have been presented treatmentwise, lessonwise and observerwise (3 X 4 X 2). The data were subjected to ANOVA on the lines of Winer (1971, p. 539). The feedback treatment happens to be significant at 0.01 level (F = 12.87, df = 2/21). In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.6 C shows the mean scores, SD and

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TABLE 4.6 A :

Basic Data in Terms of Raw Scores for Skill of Body Movement (Skill I M_5) (Moving Between the Rows and Around the Class to control / check / show the material / distribute the material / help the Group of Students)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	5	3	6	5	7	5	6	6
	4	6	5	6	5	6	6	6
Discussion (E_1)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	4	5	6	5	6	7	6	7
Sum	= 31	37	40	42	44	42	46	47
	3	3	4	4	6	4	6	5
	2	7	4	5	4	4	6	6
Oral (E_2)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	4	6	4	5	5	5	4	4
Sum	= 22	40	31	35	30	32	43	41
	3	4	5	5	6	5	5	6
	4	6	4	5	5	5	6	5
Written (E_3)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	5	6	5	5	6	6	5	6
Sum	= 32	45	41	42	45	45	44	46

TABLE 4.6 B :

Summary of ANOVA Results for Skill of Body Movement (Skill I M_5) (Moving Between the Rows and Around the Class to control / check / show the material / distribute the material / help the Groupd of Students)

Source of Variation	SS	df	MV	F
Between Subjects	70.87	23	3.08	
Feedback Treatment (T)	39.07	2	19.54	12.87 **
Subj. w groups (Error (T))	31.89	21	1.52	
Within subjects	192.63	168	1.15	
Lesson (L)	38.14	3	12.71	19.90 **
Feedback Treatment X Lesson (T X L)	10.72	6	1.79	2.80 *
L X Subj. w groups (Error(L))	40.27	63	0.64	
Observer (O)	10.55	1	10.55	7.89 *
Feedback Treatment X Observer (T X O)	1.78	2	0.89	0.67 NS
O X Subj. w groups (Error (O))	28.05	21	1.34	
Lesson X Observer (L X O)	19.02	3	6.34	9.98 **
Feedback Treatment X Lesson X Observer (T X L X O)	4.09	6	0.68	1.07 NS
L X O X Subj. w groups (Error (L X O))	40.02	63	0.64	

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

TABLE 4.6 C :

M, SD and 't' Values for Skill of Body Movement (Skill I M_5) (Moving Between the Row and Around the Class to control / check / show / distribute / help) For Three Groups E_1, E_2 and E_3.

Groups	Feedback	N	M	SD	t-values
E_1	Discussion	64	5.14	1.13	$E_1-E_2=4.07$ **
E_2	Oral	64	4.28	1.24	$E_1-E_2=0.96$ NS
E_3	Written	64	5.31	0.84	$E_2-E_3=5.45$ **

** Significant at 0.01 level
NS Not significant

t-values for three groups. The t-values between the mean scores for the component skill (Skill I M_5) of body movement, happens to be 4.07 between groups E_1 and E_2, significant at 0.01 level ; 0.96 between groups E_1 and E_3, not significant and 5.45 between groups E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that written feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be written, discussion and oral feedback. Hence treatments have shown differential effect when seen in terms of component skill (Skill I M_5) of body movement.

The F-ratio 19.19 for df 3/63 related to lesson variation, happens to be significant at 0.01 level. This indicates that there is difference in the acquisition of component skill of 'moving between the rows and around the class to control / check / show / distribute / help the group of students ' (Skill I M_5) of body movement from lesson to lesson. The simple interaction of(first order) feedback treatment X lesson is significant at 0.05 level (F = 2.80, df = 6/63). This means that a particular type of feedback treatment when coupled with a particular level of lesson, has produced significantly higher scores, than any other combination(s) due to feedback treatment and lesson. The experimental condition due to discussion feedback in lesson four is having the highest score (sum total = 93) whereas the condition of oral feedback in lesson first is the lowest (sum total = 62).

Rating by peer supervisor and self has been found significant at 0.05 level for the component skill of ' moving between the rows and around the class to control / check / show / distribute / help the group of students ' (Skill I M_5) of body movement (F = 7.89, df = 1/21). The analysis of raw scores given in the Table 4.6 A indicates that the self has rated higher (sum total = 178)

than the peer supervisor (sum total = 126). The simple interaction due to feedback treatment X observer(F = 0.67, df = 2/21) is not significant.

The interaction due to lesson and observer is significant at 0.01 level (F = 9.98, df = 3/63). This means that a particular condition due to lesson and observer produces highest scores than any other combination(s) due to lesson and observer. The experimental condition due to lesson four rated by self is having the highest score (sum total = 134) whereas the condition of lesson one rated by peer supervisor (sum total = 85) is the lowest. The interaction of (second order) feedback treatment X lesson X observer is not significant (F = 1.07, df = 6/63).

4.1.2. Skill of Gestures (Skill II GT)

Results related to the skill of gestures total and its components have been reported here to test the following three hypotheses :

H_4 - There is no differential effect of three different techniques of peer feedback - discussion, oral and written, upon the attainment of the skill of gestures.

H_4 - There is no differential effect of three different techniques of peer feedback - discussion, oral and written, upon the attainment of the skill of gestures.

H_5 - There is no practice effect of lessons upon the attainment of the skill of gestures.

H_6 - Peer and Self do not differ in their rating of the performance for the skill of gestures.

Table 4.7 A includes the raw score data for the skill of gestures (Skill II GT) (all six components). The data have been presented treatmentwise, lessonwise and observerwise (3 X 4 X 2). The data were subjected to ANOVA on the lines of Winer (1971, p.539) under Table 4.7 B. The F-ratio for the variation due to feedback treatment happens to be .004 for df 2/21. This value is not significant. This indicates that the feedback treatment has not produced differential effects upon the attainment of teaching skill of gestures (Skill II GT) (all six components). Hence hypothesis H_4 ' There is no differential effect of three different techniques of peer feedback - ~~observation~~, discussion, oral and written, upon the attainment of the skill of gestures' is accepted.

Variation in the lessons happens to be significant at 0.01 level (F = 8.81, df = 3/63). This means that there is

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TABLE 4.7 A :

Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II GT)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	26	16	27	27	17	25	20	26
	19	20	21	26	21	26	21	29
Discussion (E_1)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	30	18	33	23	19	19	22	19
Sum =	157	170	190	195	149	171	173	207
	20	26	26	19	18	22	20	18
	18	24	20	22	21	20	27	21
Oral (E_2)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	21	21	25	31	19	30	28	20
Sum =	143	172	182	183	135	196	184	169
	21	21	21	21	21	21	28	20
	21	20	22	23	20	19	26	22
Written (E_3)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	16	7	19	19	15	12	22	22
Sum =	164	171	169	183	168	170	214	205

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TABLE 4.7 B :

Summary of ANOVA Results for the Skill of Gestures
(Skill II GT)

Source of Variation	SS	df	MV	F
Between subjects	1308.67	23	56.89	
Feedback Treatment (T)	50.67	2	25.33	0.004 NS
Subj. w groups (Error(T))	1258.00	21	59.90	
Within Subjects	3265.25	168	19.43	
Lesson (L)	459.55	3	153.18	8.81 **
Feedback Treatment X Lesson (T X L)	144.45	6	24.07	1.38 NS
L X Subj. w groups (Error(L))	958.75	63	15.21	
Observer (O)	140.08	1	140.08	4.03 *
Feedback Treatment X Observer (T X O)	38.79	2	19.39	0.56 NS
O X Subj. w groups (Error (O))	692.38	21	32.97	
Lesson X Observer (L X O)	70.87	3	23.62	2.76 *
Feedback Treatment X Lesson X Observer (T X L X O)	184.76	6	30.79	3.60 **
L X O X Subj. w groups (Error (L X O)	675.62	63	10.72	

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

difference in the acquisition of skill of Gestures from lesson to lesson. Hence the hypothesis H_5, ' There is no practice effect of lessons upon the attainment of skill of Gestures' is rejected. The simple interaction of feedback treatment X lesson is not significant (F = 1.38, df = 6/63).

The rating by peer supervisor and self has differed significantly at 0.05 level for the skill of Gestures (Skill II GT) (F = 4.03, df = 1/21). The analysis of raw scores given in Table 4.7 A indicates that the self has rated higher than the peer supervisor. Hence the hypothesis H_6, ' Peer and Self do not differ in their rating of the performance for the skill of Gestures,' is rejected. The simple interaction due to feedback treatment X observer (F = 0.56, df = 2/21, Table 4.7 B) is not significant. The simple interaction due to lesson and observer is significant at 0.05 level (F = 2.76, df = 3/63, Table 4.7 B). This means that a particular condition due to lesson and observer, produces highest score than some other combination(s) due to lesson and observer. The experimental condition due to lesson four rated by self is having the highest score (sum total = 581) whereas the condition of lesson one rated by peer supervisor (sum total = 464) is the lowest. The (second order) interaction of feedback treatment X lesson X observer is significant at 0.01 level (F = 3.60, df = 6/63, Table 4.7 B).

This means that a particular type of treatment when coupled with particular level of lesson and rated by particular observer has produced significantly higher score than some other combination(s) due to feedback treatment, lesson and observer. The experimental condition due to written feedback in lesson four rated by peer supervisor is having the highest score (sum total = 214) whereas the condition of oral feedback in lesson three rated by peer supervisor (sum total = 135) is the lowest.

(a) Gestures (Skill II G_1) :
(Pointing Towards Things to Direct Attention like Aids and Blackboard Writing)

Table 4.8 A includes the raw score data for the component skill of ' pointing towards things to direct attention like aids and B.B. writing ' (Skill II G_1) of Gestures. The data in factorial design (3 X 4 X 2) have been presented treatment-wise, lessonwise and observerwise. The data were subjected to ANOVA on the lines of Winer (1971, p. 539) under Table 4.8 B. The F-ratio for the variation due to feedback treatment happens to be 5.34 for df 2/21. This value is significant at 0.05 level. This shows that feedback treatment has produced differential effect upon the attainment of component skill of ' pointing towards things to direct attention like aids and B.B. writing ' (Skill II G_1) of Gestures. In order to pinpoint the direction and amount of meann differences between three

TABLE 4.8 A :

Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II G_1) (Pointing towards Things to Direct Attention like Aids and Blackboard Writing)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	6	5	6	6	4	6	4	6
	1	1	3	3	5	5	6	5
	.	.	.	.	.	½	.	.
Discussion (E_1)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	5	4	5	4	2	4	4	4
Sum =	30	32	36	35	25	32	33	38
	5	4	6	4	4	4	5	4
	4	4	5	4	3	4	5	4
	.	.	.	.	.	.	.	.
Oral (E_2)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	4	5	6	3	4	4	2
Sum =	33	35	41	37	32	34	39	32
	4	4	4	4	5	4	6	5
	5	5	5	5	6	5	6	5
	.	.	.	.	.	.	.	.
Written (E_3)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	2	4	4	5	2	6	4
Sum =	36	32	37	39	41	37	47	43

TABLE 4.8 B :

Summary of ANOVA Results for Skill of Gestures (Skill II G_1) (Pointing Towards Things to Direct Attention like Aids and Blackboard Writing)

Source of Variation	SS	df	MV	F
Between Subjects	60.67	23	2.64	
Feedback Treatment (T)	20.45	2	10.22	5.34 *
Subj. w groups (Error (T))	40.22	21	1.92	
Within Subjects	167.00	168	0.99	
Lesson (L)	18.13	3	6.04	5.27 **
Feedback Treatment X Lesson (T X L)	11.59	6	1.93	1.68 NS
L X Subj. w groups (Error (L))	72.28	63	1.15	
Observer (O)	0.08	1	0.08	0.09 NS
Feedback Treatment X Observer (T X O)	4.89	2	2.44	2.63 NS
O X Subj. w groups (Error(O))	19.53	21	0.93	
Lesson X Observer (L X O)	1.38	3	0.46	0.88 NS
Feedback Treatment X Lesson Observer (T X L X O)	6.41	6	1.07	2.06 NS
L X O X Subj. w groups (Error (L X O)	32.72	63	0.52	

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

TABLE 4.8 C : (Skill II G_1)

M, SD and 't' Values for Skill of Gestures (Pointing Towards Things to Direct Attention like Aids and Blackboard Writing) For Three Groups E_1, E_2 and E_3 (Skill II G_1)

Groups	Feedback	N	M	SD	t-Values
E_1	Discussion	64	4.07	1.31	E_1-E_2=1.77 NS
E_2	Oral	64	4.42	0.87	E_1-E_3=3.95 **
E_3	Written	64	4.87	0.93	E_2-E_3=2.81 **

** Significant at 0.01 level
NS Not Significant

treatments groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.8 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores for the component skill (Skill II G_1) of gestures, happens to be 1.77 between groups E_1 and E_2, not significant; 3.95 between groups E_1 and E_3, significant at 0.01 level, and 2.81 between groups E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that written feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be written, oral and discussion feedback. Hence treatments have shown differential effect

when seen in terms of component skill (Skill II G_1).

Variation in the lessons happens to be significant at 0.01 level (F = 5.27, df = 3/63, Table 4.8 B). This indicates that there is difference in the acquisition of component skill (Skill II G_1) of gestures from lesson to lesson. The simple interaction of (first order) feedback treatment X lesson is not significant (F = 1.68, df = 6/63).

The rating by peer supervisor and self is not significantly different (F = 0.09, df = 1/21). The simple interaction of feedback treatment X observer (F = 2.63, df = 2/21) is not significant. The simple interaction due to lesson and observer (F = 0.88, df = 3/63) is not significant. Further the second order interaction of feedback treatment lesson X observer (F = 2.06, df = 6/63) is not significant.

(b) Gestures (Skill II G_2) :
(Waving Hands to Indicate Shape / Size / Movement / Distance / Symmetry / Vagueness / Irrelevance)

Table 4.9 A includes the raw score data for the component skill of ' waving hands to indicate shape / size / movement / distance / symmetry / vagueness / irrelevance ' (Skill II G_2) of Gestures. The data in factorial design

TABLE 4.9 A :

Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II G_2) (Waving Hands to Indicate Shape / Size / Movement / Distance / Symmetry / Vagueness / Irrelevance)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	5	4	6	6	5	5	4	6
	4	4	4	5	2	3	2	5
Discussion (E_1)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	4	4	4	4	3	3	4	1
Sum =	30	34	36	35	24	28	30	34
	3	4	5	4	3	3	4	3
	4	5	5	5	4	4	6	5
	.	.	.	.	.	.	.	.
Oral (E_2)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	5	5	6	6	3	5	6	3
Sum =	30	33	39	35	26	33	40	34
	5	5	5	5	4	5	6	4
	4	4	5	4	3	2	5	3
	.	.	.	.	.	.	.	.
Written (E_3)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	3	1	4	3	1	2	4	4
Sum =	35	36	35	35	32	32	44	38

TABLE 4.9 B :

Summary of ANOVA Results for Skill of Gestures (Skill II G_2) (Waving Hands to Indicate Shape / Size / Movement / Distance / Symmetry / Vagueness / Irrelevance)

Source of Variation	SS	df	MV	F
Between Subjects	110.42	23	4.80	
Feedback Treatment (T)	10.47	2	5.23	1.10 NS
Subj. w groups (Error(T))	100.28	21	4.78	
Within Subjects	167.25	168	0.10	
Lesson (L)	25.79	3	8.60	11.06 **
Feedback Treatment X Lesson (T X L)	7.49	6	1.25	1.61 NS
L X Subj. w groups (Error (L))	48.97	63	0.78	
Observer (O)	0.19	1	0.19	0.18 NS
Feedback Treatment X Observer (T X O)	2.09	2	1.05	1.02 NS
O X Subj. w grades (Error (O))	21.47	21	1.02	
Lesson X Observer (L X O)	5.52	3	1.84	2.26 NS
Feedback Treatment X Lesson X Observer (T X L X O)	4.45	6	0.74	0.91 NS
L X O X Subj. w groups (Error (L X O)	51.28	63	0.81	

** Significant at 0.01 level
NS Not Significant

(3 X 4 X 2) have been presented treatmentwise, lessonwise and observerwise. The data were subjected to ANOVA on the lines of Winer (1971, p.539) given under Table 4.9 B. The F-ratio for the variation due to feedback treatment, happens to be 1.10 for df 2/21. This value is not significant.

Variation in the lesson happens to be significant at 0.01 level (F = 11.06, df = 3/63, Table 4.9 B). This indicates that there is difference, in the acquisition of component skill (Skill II G_2) of Gestures from lesson to lesson. The simple interaction of feedback treatment X lesson is not significant (F = 1.61, df = 6/63, Table 4.9 B). The rating by peer supervisor and self has not differed significantly (F = 0.18, df = 1/21, Table 4.9B). The simple interaction of feedback treatment X observer has not differed significantly (F = 1.02, df 2/21). Further, the first order interaction of lesson X observer and the second order interaction of feedback treatment X lesson X observer have not differed significantly (F = 2.26, df = 3/63 and F = 0.91, df = 6/63 respectively)

(c) Gestures (Skill II G_3) :

(Movements of the Arms to emphasize and explain Ideas and Feelings)

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TABLE 4.10 A :

Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II G_3). (Movements of Arms to Emphasise and Explain Ideas and Feelings)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	5	3	5	5	3	4	4	5
	4	3	4	4	2	4	1	4
Discussion (E_1)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	5	2	5	5	3	4	3	3
Sum =	26	29	36	38	25	29	30	36
	4	4	5	3	2	4	4	3
	4	4	4	4	4	4	6	4
Oral (E_2)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	6	4	6	5	5	5	6	3
Sum =	30	28	38	30	21	35	38	27
	4	3	4	3	5	3	5	4
	5	4	4	5	4	4	5	4
Written (E_3)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	2	1	5	4	3	2	4	4
Sum =	34	28	34	35	34	31	41	39

TABLE 4.10 B :

Summary of ANOVA Results for Skill of Gestures (Skill of G_3) (Movements of Arms to Emphasise and Explain Ideas and Feelings)

Source of Variation	SS	df	MV	F
Between Subjects	78.92	23	3.34	
Feedback Treatment (T)	8.20	2	4.10	1.22 NS
Subj. w groups (Error (T))	70.72	21	3.37	
Within Subjects	199.00	168	1.18	
Lesson (L)	27.00	3	9.00	9.10 **
Feedback Treatment X Lesson (T X L)	7.72	6	1.29	1.30 NS
L X Subj. w groups (Error (L))	62.28	63	0.99	
Observer (O)	0.02	1	0.02	0.02 NS
Feedback Treatment X Observer (T X O)	5.82	2	2.91	2.48 NS
O X Subj. w groups (Error (O))	24.66	21	1.17	
Lesson X Observer (L X O)	6.73	3	2.24	3.07 *
Feedback Treatment X Lesson X Observer (T X L X O)	18.68	6	3.11	4.25 **
L X O Subj. w groups (Error (L X O)	46.09	63	0.73	

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

Table 4.10 A includes the raw score data for the component skill of ' movements of arms to emphasise and explain ideas and feelings ' (Skill II G_3) of Gestures. The data in factorial design (3 X 4 X 2) have been presented treatmentwise, lessonwise and observerwise. The data were subjected to ANOVA on the lines of Winer (1971, p. 539) given under Table 4.10 B. The F - ratio for the variation due to feedback treatment, happens to be 1.22 for df 2/21. This value is not significant.

Variation in the lesson happens to be significant at 0.01 level (F = 9.10, df = 3/63, Table 4.10 B). This indicates that there is difference, in the acquisition of component skill (Skill II G_3) of Gestures from lesson to lesson. The simple interaction of feedback treatment X lesson is not significant (F = 1.30, df = 6/63). The rating by per supervisor and self has not differed significantly (F = 0.02, df = 1/21, Table 4.10 B). The simple interaction of feedback treatment X observer has not differed significantly (F = 4.48, df = 2/21, Table 4.10 B). The simple interaction of lesson and observer is significantly different at 0.05 level (F = 3.07, df = 3/63, Table 4.10 B). This means that a particular condition due to lesson and observer produces highest

scores than some other combination(s) due to lesson and observer. The experimental condition due to lesson four rated by peer supervisor is having the highest score (sum total = 109) whereas the condition of lesson one rated by peer supervisor (sum total = 90) is the lowest. The second order interaction of feedback treatment X lesson X observer is significantly different at 0.01 level (F = 4.25, df = 6/63, Table 4.10 B). This, shows that a particular condition due to feedback treatment X lesson and observer produces highest scores than some other combination(s) due to feedback treatment, lesson and observer. The experimental condition due to written feedback in lesson four rated by peer supervisor is having the highest score (sum total = 41) whereas the condition of oral feedback in lesson three and rated by peer supervisor (sum total = 21) is the lowest.

(d) Gestures (Skill II G_4) :
(Making Shifts and Movements of Shoulders for Expressing Indifferance / Ignorance / Negative Feelings)

Table 4.11 A includes the raw score data for the component skill of ' making shifts and movements of shoulders for expressing indifference / ignorance / negative feelings ' (Skill II G_4) of Gestures. The data

TABLE 4.11 A :

Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II G_4) (Making Shifts and Movements of Shoulders for expressing Indifference / Ignorance / Negative Feelings)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
Discussion (E_1)	3	1	3	3	1	3	1	2
	2	4	2	5	3	5	3	5
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	6	1	6	3	3	2	4	4
	Sum=20	20	21	24	17	26	20	29
Oral (E_2)	2	5	2	4	3	4	1	3
	1	4	1	4	2	4	3	3
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	1	2	2	4	1	6	3	4
	Sum=11	24	13	26	11	30	13	23
Written (E_3)	3	4	2	4	3	2	4	2
	2	1	3	4	2	3	3	4
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	3	1	1	3	1	1	2	4
	Sum=19	19	18	22	17	21	24	31

TABLE 4.11 B :

Summary of ANOVA Results for Skill of Gestures (Skill II G_4) (Making Shifts and Movements of Shoulders for Expressing Indifference/ Ignorance / Negative Feelings)

Source of Variation	SS	df	MV	F
Between Subjects	62.24	23	2.71	
Feedback Treatment (T)	5.79	2	2.90	1.08 NS
Subj. w groups (Errors(T))	56.45	21	2.69	
Within Subjects	265.88	168	1.58	
Lesson (L)	7.89	3	2.63	1.57 NS
Feedback Treatment X Lesson (T X L)	8.88	6	1.48	0.88 NS
L X Subj. w groups (Error (L))	105.61	63	1.68	
Observer (O)	43.13	1	43.13	23.25 **
Feedback Treatment X Observer (T X O)	14.54	2	7.27	3.92 *
O X Subj. w groups (Error (O))	38.95	21	1.85	
Lesson X Observer (L X O)	4.14	3	1.38	2.24 NS
Feedback Treatment X Lesson X Observer (T X L X O)	3.88	6	0.65	1.05 NS
L X O Subj. w groups (Error (L X O)	38.86	63	0.62	

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

were subjected to ANOVA on the lines of Winer (1971, p.539) given under Table 4.11 B. The F - ratio for the variation due to feedback treatment, happens to be 1.08 for df 2/21. The value is not significant.

Variation in the lesson is not significant (F = 1.57, df = 3/63, Table 4.11 B). The simple interaction of feedback treatment X lesson is not significant (F = 0.88, df = 6/63, Table 4.11 B). The rating by peer supervisor and self happens to be significantly different at 0.01 level (F = 23.25, df = 1/21, Table 4.11 B). The analysis of raw scores given in Table 4.11 A indicates that self has rated higher (sum total = 178) than the peer supervisor (sum total = 48). The simple interaction of feedback treatment X observer is significantly different at 0.05 level (F = 3.92, df = 2/21, Table 4.11 B). This means that a particular condition due to feedback treatment and observer produces highest score than some other combination(s) due to treatment feedback and observer. The experimental condition due to oral feedback rated by self is having the highest score (sum total = 103) whereas the condition of oral feedback rated by peer supervisor (sum total = 48) is the lowest. The simple interaction of lesson X observer and second order interaction of feedback treatment X lesson X observer are not significant.

(e) Gestures (Skill II G_5) :
(Nodding the Head for Accepting / Rejecting Pupils Ideas and Feelings and Showing Surprise)

TABLE 4.12 A :
Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II G_5) (Nodding the Head for Accepting / Rejecting Pupils Ideas and Feelings and Showing Surprize)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
	5	2	5	5	3	6	4	5
	4	4	3	5	5	5	5	6
Discussion (E_1)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	7	5	7	5	4	5	4	5
Sum =	34	36	36	38	31	36	33	42
	5	4	5	3	3	4	5	2
	4	4	4	4	4	3	4	4
Oral (E_2)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	4	5	5	5	4	5	5	5
Sum =	30	33	37	32	23	35	37	32
	4	4	5	4	3	5	5	4
	4	5	4	4	4	4	5	4
Written (E_3)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	3	1	4	3	4	3	5	5
Sum =	31	35	36	35	32	32	40	36

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TABLE 4.12 B :

Summary of ANOVA Results for Skill of Gestures (Skill II G_5) (Nodding the Head for Accepting/Rejecting Pupils Ideas and Feelings and Showing Surprise)

Source of Variation	SS	df	MV	F
Between Subjects	89.31	23	3.88	
Feedback Treatment (T)	5.91	2	2.95	0.74 NS
Subj. w groups (Error (T))	83.41	21	3.97	
Within Subjects	173.50	168	1.03	
Lesson (L)	12.44	3	4.15	4.73 **
Feedback Treatment X Lesson (T X L)	0.84	6	0.14	0.16 NS
L X Subj. w groups (Error (L))	55.22	63	0.88	
Observer (O)	2.52	1	2.52	2.40 NS
Feedback Treatment X Observer (T X O)	2.95	2	1.47	1.41 NS
O X Subj. w groups (Error (O)	22.03	21	1.05	
Lesson X Observer (L X O)	5.52	3	1.84	1.90 NS
Feedback X Treatment X Lesson Observer (T X L X O)	10.89	6	1.81	1.87 NS
L X O Subj. w groups (Error (L X O)	61.09	63	0.97	

** Significant at 0.01 level
NS Not Significant

Table 4.12 A includes the raw score data for the component skill of ' nodding the head for accepting / rejecting pupils' ideas and feeling and showing surprise' (Skill II G_5) of Gestures. The data in factorial design (3 X 4 X 2) have been presented treatmentwise, lessonwise and observerwise. The data were subjected to ANOVA on the lines of Winer (1971, p. 539) given under Table 4.12 B. The F - ratio for the variation due to feedback treatment, happens to be 0.74 for df 2/21. The value is not significant.

Variation in the lesson happens to be significant at 0.01 level (F = 4.73, df = 3/63, Table 4.12 B). This indicates that there is difference in the acquisition of component skill (Skill II G_5) of Gestures from lesson to lesson. The simple interaction of feedback treatment X lesson is not significant (F = 0.16, df = 6/63, Table 4.12 B). The rating by peer supervisor and self has not differed significantly (F = 2.40, df = 1/21, Table 4.12 B). The other interactions of feedback treatment X observer (F = 1.41, df = 2/21, Table 4.12 B), lesson and observer (F = 1.90, df = 3/63, Table 4.12 B) and feedback treatment, X lesson X observer (F = 1.87, df = 6/63, Table 4.12 B) are not significant.

(f) Gestures (Skill II G_6) :
(Making Mimicry or Dramatic Representation for Communicating Ideas and Expressing Emotions)

TABLE 4.13 A :

Basic Data in Terms of Raw Scores for Skill of Gestures (Skill II G_6) (Making Mimicry or Dramatic Representation for Communicating Ideas and Expressing Emotions)

Feedback	Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Peer	Self	Peer	Self	Peer	Self	Peer	Self
Discussion (E_1)	2	1	2	2	1	1	3	2
	4	4	5	4	4	4	4	4
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	3	2	6	2	4	1	3	2
Sum =	17	19	25	25	27	20	27	28
Oral (E_2)	1	5	3	1	3	3	1	3
	1	3	1	1	4	1	3	1
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	2	1	1	5	3	5	4	3
Sum =	10	19	14	23	22	29	17	21
Written (E_3)	1	1	1	1	1	2	2	1
	1	1	1	1	1	1	1	2
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
	1	1	1	2	1	2	1	1
Sum =	9	21	9	17	12	17	17	18

TABLE 4.13 B :

Summary of ANOVA Results for Skill of Gestures (Skill II G_6)

(Making Mimicry or Dramatic Representation for Communicating Ideas and Expressing Emotions)

Source of Variation	SS	df	MV	F
Between Subjects	112.87	23	4.91	
Feedback Treatment (T)	37.70	2	18.85	5.27 *
Subj. w groups (Error (T))	75.17	21	3.58	
Within Subjects	249.63	168	1.49	
Lesson (L)	14.89	3	4.96	0.46 NS
Feedback Treatment X Lesson (T X L)	13.84	6	2.31	0.21 NS
L X Subj. w groups (Error (L))	67.39	63	1.07	
Observer (O)	13.55	1	13.55	6.05 *
Feedback Treatment X Observer (T X O)	8.84	2	4.42	1.98 NS
O X Subj. w groups (Error (O))	46.98	21	2.24	
Lesson X Observer (L X O)	4.77	3	1.59	1.35 NS
Feedback Treatment X Lesson X Observer (T X L X O)	5.03	6	0.84	0.71 NS
L X Subj. w groups (Error (L X O))	74.33	63	1.18	

* Significant at 0.05 level
NS Not Significant

TABLE 4.13 C :

M, SD and 't' Values for Skill of Gestures (Skill II G_6) (Making Mimicry or Dramatic Representation for Communicating Ideas and Expressing Emotions) for Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-Values
E_1	Discussion	64	2.93	1.21	$E_1-E_2=2.10$ *
E_2	Oral	64	2.42	1.51	$E_1-E_3=4.98$ **
E_3	Written	64	1.87	1.20	$E_2-E_3=2.27$ *

** Significant at 0.01 level
* Significant at 0.05 level

Table 4.13 A includes the raw score data for the component skill of ' making mimicry or dramatic representation for communicating ideas and expressing emotions ' (Skill II G_6) of Gestures. The data in factorial design (3 X 4 X 2) have been presented treatmentwise, lessonwise and observerwise. The data were subjected to ANOVA on the lines of Winer (1971, p.539) given under Table 4.13 B. The F-ratio for the variation due to feedback treatment, happens to be 5.27 for df 2/21. This value is significant at 0.05 level. It shows that the feedback treatment has produced differential effect

upon the attainment of component skill (Skill II G_6) of gestures. In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.13 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores for the component skill (Skill II G_6) of Gestures, happens to be 2.10 between groups E_1 and E_2, significant at 0.05 level; 4.98 between groups E_1 and E_3, significant at 0.01 level ; and 2.27 between groups E_2 and E_3, significant at 0.05 level. The corresponding mean scores and the t-values indicate that discussion feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be discussion, oral and written feedback. Hence treatments have shown differential effect when seen in terms of component skill (Skill II G_6) of Gestures.

Variation in lesson is not significant (F = 0.46, df = 3/63, Table 4.13 B). The simple interaction of feedback treatment X lesson is also not significant (F = 0.21, df = 6/63, Table 4.13 B). The rating by peer supervisor and self has differed significantly at 0.05 level (F = 6.05, df = 1/21, Table 4.13 B). This shows

from the analysis of raw scores given in Table 4.13 A that one peer supervisor has rated higher (sum total = 96) than another peer supervisor (sum total = 47). The simple interaction of feedback treatment X observer (F = 1.98, df = 2/21, Table 4.13 B) is not significant. The simple interaction of lesson X observer is also not significant. The second order interaction of feedback treatment X lesson X observer is not significantly different.

4.1.3. Skill of Shifting Sensory Channels (Skill III)

Results related to the Skill of Shifting Sensory Channels have been reported here to test the following hypotheses under (a) and (b) part of it.

H_7 - There is no differential effect of three different techniques of peer feedback - discussion, oral and written, upon the attainment of the skill of Shifting Sensory Channels - ' Total Record of Events'.

H_8 - There is no practice effect of lessons upon the attainment of the skill of Shifting Sensory Channels - ' Total Record of Events'.

H_9 - There is no differential effect of three different techniques of peer feedback - discussion, oral, and written, upon the attainment of the skill of Shifting Sensory Channels - ' Total Shifts in Events'.

H_{10} - There is no practice effect of lessons upon the attainment of the skill of Shifting Sensory Channels - ' Total Shiftsin Events'.

(a) Shifting Sensory Channels (Skill III TRE) : (Total Record of Events)

TABLE 4.14 A :
Basic Data in Terms of Raw Scores for Skill of Shifting Sensory Channels (Skill III TRE) (Total Record of Events)

Feedback	Lesson 1 (Peer)	Lesson 2 (Peer)	Lesson 3 (Peer)	Lesson 4 (Peer)
	80	80	80	78
	79	70	77	79
Discussion (E_1)	⋮	⋮	⋮	⋮
	78	80	80	80
Sum =	631	629	636	625
	78	80	67	73
	77	80	80	72
Oral (E_2)	⋮	⋮	⋮	⋮
	80	72	70	77
Sum =	603	612	597	616
	75	78	90	92
	80	95	91	91
Written (E_3)	⋮	⋮	⋮	⋮
	84	78	74	81
Sum =	641	607	698	693

TABLE 4.14 B :

Summary of ANOVA Results for Skill of Shifting Sensory Channels (Skill III TRC) (Total Record of Events)

Source of Variation	SS	df	MV	F
Between Subjects	252584.00	23	10981.91	
Feedback Treatment (T)	1592.65	2	796.32	17.92 **
Subjects within groups	933.19	21	44.43	
Within Subjects	1493.45	72	20.74	
Lesson (L)	129.59	3	43.19	2.41 NS
Feedback Treatment X Lesson (T X L)	237.60	6	39.60	2.21 NS
B X Subjects within groups	1126.31	63	17.87	

** Significant at 0.01 level
NS Not Significant

TABLE 4.14 C :

M, SD and 't' Values for Skill of Shifting Sensory Channels (Total Record of Events) for Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-values
E_1	Discussion	32	78.78	2.15	E_1-E_2=3.38 **
E_2	Oral	32	75.87	4.37	E_1-E_3=5.03 **
E_3	Written	32	85.59	7.33	E_2-E_3=6.43 **

** Significant at 0.01 level

Table 4.14 A includes the raw score data for the skill of Shifting Sensory Channels - ' Total Record of Events ' (Skill III TRE). The data in factorial design have been (3 X 4) presented treatmentwise and lessonwise. The data were subjected to ANOVA on the lines of Winer (1971). The F-ratio for the variation due to feedback treatment happens to be 17.92 for df 2/21. This value is significant at 0.01 level. This indicates that feedback treatment has produced differential effect upon the attainment of teaching skill of shifting Sensory Channels - ' Total Record of Events ' (Skill III TRE). Hence the hypothesis H_7 ' There is no differential effect of three different techniques of peer feedback, upon the attainment of teaching skill of Shifting Sensory Channels - ' Total Record of Events' is rejected.

In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.14 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores for the Shifting Sensory Channels - ' Total Record of Events ' (Skill III TRE) happens to be 3.38 between groups E_1 and E_2, significant at 0.01 level; 5.03 between groups E_1 and E_3, significant at 0.01 level; and 6.43 between groups E_2 and E_3,

significant at 0.01 level. The corresponding mean scores and the t-values indicate that written feedback group has shown the highest effect as compared to the other two treatments. The descending order of effectiveness of the three treatments happens to be written, discussion and oral feedback. Hence treatments have shown differential effect when seen in terms of the Skill of Shifting Sensory Channels - ' Total Record of Events ' (Skill III TRE).

Further, trend of variation related to lesson was found not significantly different (F = 2.41, df = 3/63, Table 4.14 B). Hence the hypothesis H_8 ' There is no practice effect of lessons upon the attainment of the skill of Shifting Sensory Channels - Total Record of Events' is accepted. The simple interaction of feedback treatment X lesson were found not significantly different (F = 2.21, df = 6/63, Table 4.14 B).

(b) Shifting Sensory Channels (Skill III TSE) (Total Shifts in Events) :

Table 4.15 A includes the raw score data for the skill of 'Shifting Sensory Channels - ' Total Shifts in Events ' (Skill III TSE). The data in factorial design (3 X 4) have been presented treatmentwise and lessonwise. The data were subjected to ANOVA on the lines of Winer (1971). The F-ratio for the variation due to feedback treatment happens

TABLE 4.15 A :

Basic Data in Terms of Raw Scores for Skill of Shifting Sensory Channels (Skill III TSE) (Total Shifts in Events)

Feedback	Lesson 1 (Peer)	Lesson 2 (Peer)	Lesson 3 (Peer)	Lesson 4 (Peer)
	45	48	46	50
	36	49	39	46
	.	.	.	.
Discussion	.	.	.	.
(E_1)	.	.	.	.
	39	36	35	52
Sum =	326	351	369	433
	38	60	36	35
	44	65	65	55
	.	.	.	.
Oral	.	.	.	.
(E_2)	.	.	.	.
	50	44	62	44
Sum =	417	441	415	394
	46	67	67	74
	52	71	63	86
	.	.	.	.
Written	.	.	.	.
(E_3)	.	.	.	.
	69	63	57	68
Sum =	475	577	561	585

TABLE 4.15 B :

Summary of ANOVA Results for Skill of Shifting Sensory Channels (Skill III TSE) (Total Shifts in Events)

Source of Variation	SS	df	MV	F
Between Subjects	11611.34	23	504.84	
Feedback Treatment (T)	8690.27	2	4345.13	31.23**
Subjects within groups	2921.07	21	139.09	
Within Subjects	5606.00	72	77.86	
Lesson (L)	869.59	3	289.86	6.95**
Feedback Treatment X Lesson (T X L)	2109.73	6	351.62	8.43**
L X Subjects within groups	2626.68	63	41.69	

** Significant at 0.01 level

TABLE 4.15 C :

M, SD and 't' Values for Skill of Shifting Sensory Channels (Skill III-TSE) For Three Groups E_1, E_2 and E_3

Groups	Feedback	N	M	SD	t-values
E_1	Discussion	32	46.21	9.53	E_1-E_2=2.61 *
E_2	Oral	32	52.09	9.27	E_1-E_3=8.98 **
E_3	Written	32	68.68	10.29	E_2-E_3=6.76 **

** Significant at 0.01 level

* Significant at 0.05 level

to be 31.23 for df 2/21. This value is significant at 0.01 level. This shows that feedback treatment has produced differential effect upon the development of teaching skill of Shifting Sensory Channels - ' Total Shifts in Events ' (Skill III TSE). Hence hypothesis H_9 ' There is no differential effect of three different techniques of peer feedback, upon the attainment of teaching skill of Shifting Sensory Channels - Total Shifts in Events - is rejected.

In order to pinpoint the direction and amount of mean differences between three treatment groups - E_1, E_2 and E_3, the significance of difference between means was also employed. Table 4.15 C shows the mean scores, SD and t-values for three groups. The t-values between the mean scores for the skill Shifting Sensory Channels - 'Total Shifts in Events ' (Skill III TSE) happens to be 2.61 between groups E_1 and E_2, significant at 0.05 level; 8.98 between groups E_1 and E_3 , significant at 0.01 level ; and 6.76 between groups E_2 and E_3, significant at 0.01 level. The corresponding mean scores and the t-values indicate that written feedback group has shown the highest effect as compared to the other two treatments. The descenting order of effectiveness of the three treatments happens to be written, oral and discussion feedback. Hence feedback treatment have shown differential effect when seen in terms of the skill of Shifting Sensory

channels - ' Total Shifts in Events ' (Skill III TSE).

The F - ratio of 6.95 for df 3/63 related to lesson variation, happens to be significant at 0.01 level. This indicates that there is a difference, in the acquisition of skill of shifting sensory channels with regard to ' Total Shifts in the Events ' from lesson to lesson. Hence hypothesis H_{10} ' There is no practice effect of lessons upon the attainment of the skill of Shifting Sensory Channels - Total Shifts in Events ' is rejected. The simple interaction of feedback treatment X lesson is significant at 0.01 level (F = 8.43, df = 6/63). This means that a particular type of treatment when coupled with a particular level of lesson has produced significantly higher scores than some other combination(s) due to treatment and lesson. The experimental condition due to written feedback in lesson four is having the highest score (Sum total = 585) whereas the score (sum total = 326) for the experimental condition discussion feedback at lesson one is the lowest.

4.2.0. ATTITUDE, EVALUATION AND FREE RESPONSES TOWARDS MICROTEACHING

This caption deals with analysis of the data related to the attitude of teacher trainee towards microteaching and the self evaluation of microteaching programme administered

after the Laboratory Stage was over. Results related to the attitude of teacher trainee towards microteaching have been reported under caption 4.2.1 in Tables 4.16 A, B and C and results related to the self evaluation of microteaching programme have been reported under caption 4.2.2 in Tables 4.17 A, B and C. Qualitative analysis of the Free Responses of trainees to stimulus words or statements has been reported in chapter V.

4.2.1. Attitude

Results related to the attitude of teacher trainee towards microteaching are reported as under, to test the following hypothesis :

H_{11} - There is no difference in the attitude of three experimental groups - E_1, E_2 and E_3 towards microteaching programme.

Table 4.16 A includes the raw score data for two covariates: (Achievement (X_1) and Pretest (X_2) and criterian variable (Scores on Attitude Scale - Y_2) for three experimental groups - E_1, E_2 and E_3. The data were subjected to ANCOVA and have been presented in Table 4.16 B. The adjusted F - ratio of 0.40 for df 2/19 is not significant.

Hence, the hypothesis H_{11} ' There is no difference in the attitude of three experimental groups E_1, E_2 and E_3 towards microteaching programme' is accepted.

TABLE 4.16 A :

Raw Scores ANCOVA With Two Covariates - Achievement (X_1), Pretest on GTCOS (X_2) and Criterian Variable - Scores on Attitude Scale (Y_2)

Groups	E_1			E_2			E_3		
Covariates	X_1	X_2	Y_2	X_1	X_2	Y_2	X_1	X_2	Y_2
Raw Scores	52	71	104	49	69	151	59	45	162
	49	59	167	54	62	165	55	63	154
	51	55	158	50	68	161	61	57	190
	56	53	165	50	48	174	49	36	189
	50	57	160	52	71	160	52	46	158
	51	44	164	52	41	144	52	30	151
	52	73	155	51	49	176	60	67	185
	51	46	157	60	99	163	53	52	152
Total	51.50	57.25	153.75	52.25	63.37	161.75	55.12	49.50	167.62

TABLE 4.16 B :

Summary of ANCOVA with the Covariates - Achievement (X_1), Pretest on GTCOS (X_2) and Criterian Variable - Scores on Attitude Scale (Y_2)

Sources of Variation	EY_2^2	EY_2X_1	EY_2X_2	EX_1X_2	EX_1^2	EX_2^2	df	..(Contd.)
Between Groups (Treatment)	776.08	195.16	-373.45	-169.04	58.58	773.58	2	
Within Groups (Error)	3840.87	166.87	-562.25	565.75	250.37	4237.37	21	
Total	6616.95	363.04	-935.70	396.70				
	$EY_2'^2$	$EY_2'X_1'$	$EY_1'X_2'$	$EX_1'X_2'$	$EX_1'^2$	$EX_2'^2$	F Unadjusted	F Adjusted
Between Groups (Treatment)	388.04	97.58	-186.72	-84.52	29.29	386.79	1.40 (NS)	0.57 (NS)
Within Groups (Error)	278.13	7.94	- 26.77	26.94	11.92	201.77		

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

Unadjusted Mean Square Deviation = 278.1369 (df 21)
Reduction Sum of Squares = 409.4062 (df 2)
Deviations Sum of Squares = 5431.4688 (df 19)
Adjusted Mean Square Deviation = 285.8668 (df 19)

F-Value for adjusted means of Treatments is not significant for criterian variable-Scores on Attitude Scale

Table 4.16 C :

Unadjusted and Adjusted Mean Scores of Y_2 under Three Treatment Conditions

Treatment	N	Unadjusted Means	Adjusted Means
E_1	8	153.75	155.94
E_2	8	161.75	164.85
E_3	8	167.63	162.34

4.2.2. Evaluation

Results related to the self evaluation of microteaching programme are reported as under to test the following hypothesis :

H_{12} - There is no difference in the self evaluation of three experimental groups - E_1, E_2 and E_3 towards microteaching programme.

Table 4.17 A includes the raw score data for two covariates (Achievement - X_1 and Pretest - X_2) and criterian variable (Scores on Self Evaluation - Y_3) for three groups - E_1, E_2 and E_3. The data were subjected to ANCOVA and have been presented in Tables 4.17 B. The adjusted F-ratio of 1.97 for df 2/19 is not significant. Hence hypothesis H_{12} ' There is no difference in the self evaluation of three experimental groups - E_1, E_2 and E_3 towards microteaching programme,' has been accepted.

TABLE 4.17 A :

Raw Scores for ANCOVA with Two Covariates - Achievement (X_1), Pretest on GTCOS (X_2) and Criterian Variable Scores on Self Evaluation (Y_3)

Groups	E_1			E_2			E_3		
Covariates/CV	X_1	X_2	Y_3	X_1	X_2	Y_3	X_1	X_2	Y_3
Raw Scores	52	71	109	49	69	129	59	45	108
	49	59	111	54	62	122	55	63	133
	51	55	129	50	68	119	61	57	123
	56	53	115	50	48	128	49	36	144
	50	57	104	52	71	113	52	46	111
	51	44	127	52	41	129	52	30	114
	52	73	113	51	49	130	60	67	125
	51	46	111	60	99	119	53	52	111
Mean	51.50	57.25	114.87	52.25	63.37	123.62	55.13	49.50	121.12

TABLE 4.17 B :

Summary of ANCOVA with Two Covariates - Achievement (X_1), Pretest on GTCOS (X_2) and Criterian Variable - Scores on Self Evaluation (Y_3)

Sources of Variation	EY_3^2	EY_3X_1	EY_3X_2	EX_1X_2	EX_1^2	EX_2^2	df
Between Groups (Treatment)	325.00	58.75	106.15	-169.04	58.58	773.58	2
Within Groups (Error)	1919.62	-137.87	-636.12	565.75	250.37	4237.37	21
Total	2244.62	-79.12	-529.87	396.70	308.95	5010.95	

	EY'^2_3	$EY'_3X'_1$	$EY'_3X'_2$	EX'_1X_2	EX'^2_1	EX'^2_2	F Un-adjusted	F adjusted
Between Groups (Treatment)	162.50	29.37	53.12	-84.52	29.29	386.79	1.78 NS	1.97 NS
Within Groups (Error)	91.41	-6.56	-30.29	26.94	11.92	201.77		

E Stands for 'Σ'

Unadjusted Mean Square Deviation = 91.4107 (df = 21)
Reduction Sum of Squares = 111.5284 (df = 22)
Deviations Sum of Squares =1808.0966 (df = 19)
Adjusted Square Deviation = 95.1630 (df = 19)

F-value for adjusted means of Treatments is not significant for criterian variable - Scores of Self-Assessment

NS Not Significant

TABLE 4.17 C :
Unadjusted and Adjusted Mean Scores of Y_3 Under Three Treatment Conditions

Treatment	N	Unadjusted Means	Adjusted Means
E_1	8	114.87	114.89
E_2	8	123.62	124.14
E_3	8	121.12	120.99

4.2.3. Free Responses

Qualitative analysis of the free responses of three experimental groups has been reported in Chapter V.

4.3.0. SCHOOL STAGE (GENERAL TEACHING COMPETENCE)

Second part of the data collection deals with the school stage related to general teaching competence of teacher trainees. Data at school stage in pre and post tests have been reported here.

4.3.1. Transfer of General Teaching Competence

Results related to pretest and posttest on GTCOS at school stage regarding the transfer of General Teaching Competence from training to classroom teaching have been given as under to test the following hypothesis :

TABLE 4.18 :

Raw Scores for ANCOVA with Two Co-variates Achievement (X_1), Pretest on GTCOS (X_2) and Criterian Variable - Posttest on GTCOS (Y_1)

Groups --	E_1			E_2			E_3			C		
Covariates/CV	X_1	X_2	Y_1	X_1	X_2	Y_1	X_1	X_2	Y_2	X_1	X_2	Y_1
	52	71	112	49	69	116	59	45	104	53	57	30
	49	59	108	54	62	118	55	63	116	55	59	76
	51	55	110	50	68	106	61	57	122	51	58	71
Raw Scores	56	53	120	50	48	124	49	36	108	53	43	67
	50	57	98	52	71	108	52	46	112	53	52	79
	51	44	108	52	41	109	52	30	86	50	50	80
	52	73	96	51	49	86	60	67	119	53	33	90
	51	46	92	60	99	134	53	52	106	54	55	90
Mean	51.50	57.25	105.50	52.25	63.37	112,62	55.12	49.50	109.12	52.75	50.88	79.13

TABLE 4.18 B :

Summary of ANCOVA with Two Covariates - Achievement (X_1), Pretest on GTC (X_2) and Criterian Variable - Posttest on GYCOS (Y_1)

(E Stands for Σ)

Sources of Variation	EY_1^2	EY_1X_1	EY_1X_2	EX_1X_2	EX_1^2	EX_2^2	df
Between Groups (Treatment)	5588.09	59.91	1219.50	-161.75	58.84	977.75	3
Within Groups (Error)	3379.63	458.88	1689.75	574.50	267.88	4792.25	28
Total	8967.72	518.78	2909.25	412.75	326.72	5770.00	31

(continued)

	$EY_1'^2$	$EY_1'X_1$	EY_1X_2'	EX_1X_2'	EX_1^2	$EX_2'^2$	F Un-adjusted	F Adjusted
Between Groups (Treatment)	1862.70	19.97	406.50	-53.92	19.61	325.92	15.43	16.68
Within Groups (Error)	120.70	16.39	60.35	20.52	9.57	171.15		

Unadjusted Mean Square Deviation = 120.70 (df = 28)
Reduction Sum of Squares = 925.96 (df = 2)
Deviations Sum of Squares = 2453.71 (df = 26)
Adjusted Mean Square Deviation = 94.37 (df = 26)

F-value for adjusted mean of Treatment is significant for criterian variable - Posttest on GTCOS (Y_1)

** Significant at 0.01 level

TABLE 4.18 C :

Significance of Difference Between Adjusted Mean Scores of Y_1 under Four Treatment Conditions

Treatment	N	Unadjusted Means	Adjusted Means	t-values
E_1	8	105.50	106.91	E_1-E_2 = 0.91
E_2	8	112.62	111.86	E_1-E_3 = 0.09
E_3	8	109.12	107.41	E_2-C = 4.91 **
C	8	79.13	80.00	E_2-E_3' = 0.82
				E_2-C = 5.82 **
				E_3-C' = 5.00 **

** Significant at 0.01 level

H_{18} - ' There is no differential effect of two different techniques of training - microteaching simulation and convential teaching practice with regard to General Teaching Competence to classroom teaching.

Table 4.18 A includes the raw score data for two covariates (Achievement - X_1 and Pretest - X_2) and criterian variable (Posttest - Y_1 on GTCOS) for four groups - E_1, E_2, E_3 and C. The data were subjected to ANCOVA and have been presented in Table 4.18 B. The adjusted F - ratio of 16.68 for df 3/26 is significant at 0.01 level. The adjusted means of discussion group (M = 106.91), oral group (M = 111.86) written group (107.41), and control group (M = 80.00), were compared by applying t - test. It was found that all the three treatment

groups - E_1, E_2 and E_3 scored significantly higher means scores than the control group C. The mean differences between groups E_1 - C, E_2 - C, E_3 - C are significant at 0.01 level. Further mean scores for General Teaching Competence for the groups - E_1, E_2 and E_3 did not differ significantly. Hence the hypothesis H_{13}, ' There is no differential effect of two different techniques of training - microteaching simulation and conventional teaching practice with regard to General Teaching Competence transferred to classroom teaching,' is rejected.

Discussion of the results has been presented in chapter V.
