C H A P T E R FOUR

RESULTS

4.0 Introduction

This chapter is devoted to the presentation of results of pilot study and the final experiment. Section I of the present chapter provides the results of the pilot study, section II includes results of the final experiment, starting with the inter observer reliability, pre-treatment comparison of the matrices, pre and post treatment matrix comparisons of control and experimental groups, and inter group comparisons of post-treatment matrices. Use of 't' -test for significance of differences between means of different variables has been made in all matrix comparison. Section III deals with the comparison of the results of micro-teaching within the treatment stages. It may be noted that throughout the tables, the coded symbols have been used to represent different variables. The details have already been given in chapter III. The symbols used are given below for ready reference:

C - Control group

E_1 - Experimental micro-teaching group I

E_2	-	Experimental FIACS group II
MT	-	Micro-teaching
FIACS	-	Flanders Interaction Analysis Category System
TT	-	Teacher Talk
ST	-	Student Talk
S/C	-	Silence/Confusion
T/S Ratio	-	Teacher Student Talk Ratio
SSR	-	Steady State Ratio
I/D	-	Indirect-Direct Ratio
i/d	-	Revised indirect-direct ratio
Ext.Ind.	-	Extended Indirect
Ext.Direct-		Extended direct

SECTION I

4.1 Pilot Study Results

Below are given the results of the pilot study:

4.1.1 Observer Reliability

After repeated observation performance by the investigator the inter-observer reliability with a trained observer was found out by Scott's reliability coefficient described by Flanders (1960(b)).The reliability was calculated on the basis of data obtained for 20 minutes of observation.

TABLE 4.1

Calculating Inter-Observer Reliability by Scott's Method Using Per cent

Category	Observer A	Observer B	% A	% B	% Difference	(Average %)^2
1	1	2	.268	.500	.232	.001
2	11	13	2.949	3.485	.536	.103
3	2	4	.536	1.00	.464	.005
4	25	27	6.702	6.750	.048	.451
5	273	281	73.190	70.250	2.940	51.437
6	5	7	1.340	1.750	.410	.023
7	1	1	.268	.250	.018	.001
8	33	39	8.847	9.750	.903	.863
9	4	5	1.075	1.250	.175	.013
10	18	21	4.825	5.050	.225	.253
Total	373	400	100.000	100.035	5.951	53.150

$$Pi = \frac{Po - Pe}{100 - Pe}$$

$$= \frac{(100 - 5.951) - 53.150}{100 - 53.150}$$

$$= .872$$

4.1.2 Post-Treatment Matrices

The comparisons of post-treatment combined interaction matrices of control and experimental groups for one

hour of observation each combined through the process of cell by cell addition of individual matrices are given in Tables 4.2 and 4.3.

TABLES 4.2 and 4.3

4.1.3 Comparison of Variables for Significance

The differences have been tested for significance by applying the 't' test. The formula and the procedure used to find out the value of 't' test is as given by Garrett (1969) .

TABLE 4.4

The purpose of the pilot study was to see whether the theoretical treatment of Flanders Interaction Analysis Category System helps in modifying the student-teacher classroom behaviour as well as to see the administrative difficulties which may come in implementing the study. The pilot study has fulfilled both the objectives. The results show significant differences between the control group and experimental group on the variables of Steady-State Ratio, I/D, i/d, Extended Indirect, and loading in 3-3 and 9-9 cells. In the light of the experience gained in the process

TABLE 4.2

Post-Treatment Combined Interaction Matrix
for Experimental FIACS Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	40	1	5	7	20	3	-	-	1	4	81
2	2	236	94	112	25	8	-	25	10	14	526
3	3	6	405	43	154	-	-	2	20	10	643
4	1	12	-	715	1	-	-	477	3	158	1367
5	6	-	-	156	4759	11	-	1	42	117	5092
6	-	1	-	3	1	28	-	20	-	18	71
7	-	2	6	6	13	1	12	1	-	1	42
8	8	211	61	189	18	13	28	1130	16	68	1742
9	4	35	54	1	7	-	1	-	156	18	276
10	17	22	18	135	94	7	1	86	28	1552	1960
Total	81	526	643	1367	5092	71	42	1742	276	1960	11720

TABLE 4.3

Post-Treatment Combined Interaction Matrix
for Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	13	-	1	-	17	-	-	-	-	1	32
2	-	34	11	42	11	1	-	7	-	3	109
3	-	1	53	11	34	3	-	-	1	2	105
4	-	1	-	601	-	1	2	456	-	123	1184
5	2	-	-	117	5693	12	-	1	13	174	6012
6	-	1	1	7	8	49	2	93	1	22	184
7	1	-	3	22	63	7	90	2	2	8	198
8	3	70	33	232	22	84	89	1125	7	78	1743
9	2	1	1	-	13	4	4	1	35	13	74
10	11	1	2	152	151	23	11	58	15	1790	2214
Total	32	109	105	1184	6012	184	198	1743	74	2214	11855

TABLE 4.4

Control versus Experimental Groups on the Basis of Post-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variable	Control Group N = 10		Experimental Group N = 10		't'
	M	SD	M	SD	
Teacher Talk	65.312	3.111	66.294	2.909	.699
Student Talk	16.166	3.690	18.031	4.880	.915
Silence/ Confusion	18.687	4.552	16.615	3.192	.968
T/S Ratio	4.375	1.545	3.975	.612	.733
SSR	80.060	1.353	76.612	1.902	4.918**
I/D	.183	.001	.333	.056	6.818**
i/d	.389	.707	.907	.055	17.266**
Ext.Indirect	.952	.319	6.721	1.959	8.916**
Ext.Direct	1.282	.383	.347	.714	1.275
3-3 Cell	.445	.848	3.437	1.425	6.207**
9-9 Cell	.296	.247	1.322	.602	13.912**

** Significant at .01 level

of experiment and administrative difficulties anticipated due care was taken in planning the final study.

SECTION II

4.2 Final Experiment Results

The results of the final experiment are given below:

4.2.1 Inter-Observer Reliability

To check whether the observation performance by the investigator continues to be 0.85 or higher as Scott's Reliability Coefficient which is considered to be reasonable level of performance (Flanders, 1960(b)), the reliability was calculated on the basis of data obtained for 20 minutes of observation.

TABLE 4.5

Calculating Inter-Observer Reliability by Scott's Method Using Per cent

Category	Observer A	Observer B	% A	% B	% Difference	(Average %)^2
1	1	1	.243	.233	.010	.000
2	9	12	2.189	2.797	.608	.062
3	3	2	.729	.466	.263	.003
4	23	23	5.596	5.361	.235	.299
5	300	307	72.992	71.561	1.431	52.229
6	5	3	1.216	.699	.517	.009
7	4	3	.973	.699	.274	.006
8	36	42	8.759	9.790	1.031	.857
9	6	8	1.459	1.864	.405	.027
10	24	28	5.839	6.526	.687	.381
Total	411	429	99.995	99.996	5.461	53.875

$$Pi = \frac{Po - Pe}{100 - Pe}$$

$$= \frac{(100 - 5.461) - 53.875}{100 - 53.875}$$

$$= .881$$

4.2.2 Comparison of Pre-treatment Interaction Matrices

The Darwin's Likelihood Criterion Ratio as mentioned in chapter III provides a test to find out whether two or more matrices are significantly different from one another with regard to the sequential pattern of distribution of tallies in them. Darwin's test was carried out on the three matrices combined each through the process of cell by cell addition of individual matrices. The fourth matrix was prepared by combining all the three matrices through the process of cell by cell addition. All the four matrices are given in Tables 4.6 to 4.9.

TABLE 4.6

Pre-Treatment Combined Matrix Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	2	-	-	-	4	-	-	-	-	-	6
2	-	2	-	6	7	3	-	-	-	-	18
3	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	46	-	1	-	44	-	30	121
5	2	-	-	23	2524	5	-	-	7	129	2690
6	-	-	-	-	9	26	6	42	-	23	106
7	1	1	-	6	21	28	73	-	-	4	134
8	-	10	-	17	1	20	32	134	-	11	225
9	-	3	-	1	1	1	-	-	4	7	17
10	1	2	-	22	123	22	23	5	6	499	703
Total	6	18	-	121	2690	106	134	225	17	703	4020

TABLE 4-7

Pre-Treatment Combined Matrix Micro-Teaching Experiment Group I (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	3	-	-	-	-	-	3
2	-	1	-	2	-	3	-	-	-	-	6
3	-	-	1	-	1	-	-	-	-	-	2
4	-	-	-	25	-	-	-	5	-	23	53
5	-	-	-	10	1303	1	-	-	-	70	1384
6	-	-	-	1	-	41	-	30	-	4	36
7	-	-	-	2	5	3	9	-	-	1	20
8	-	4	1	1	3	15	8	71	-	11	114
9	-	-	-	-	1	-	-	-	-	-	1
10	3	1	-	12	68	13	3	8	1	283	392
Total	3	6	2	53	1384	36	20	114	1	392	2011

TABLE 4.8

Pre-Treatment Combined Matrix Experimental Group II (FIACS) (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	1	-	-	-	-	-	1
2	-	-	-	2	2	-	-	-	-	2	6
3	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	27	1	-	-	20	-	20	68
5	-	1	-	11	1359	-	-	-	-	75	1446
6	-	-	-	-	-	-	-	17	-	3	20
7	-	1	-	1	8	9	15	-	-	6	40
8	-	1	-	7	2	5	21	53	-	7	96
9	-	-	-	-	-	-	-	-	-	1	1
10	1	3	-	20	73	6	4	6	1	216	330
Total	1	6	-	68	1446	20	40	96	1	330	2008

TABLE 4.9

Pre-Treatment Total Combined Matrix
of Combined Matrices of all Groups
(C, E_1, E_2) (N = 20)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	2	-	-	-	8	-	-	-	-	-	10
2	-	3	-	10	9	6	-	-	-	2	30
3	-	-	1	-	1	-	-	-	-	-	2
4	-	-	-	98	1	1	-	69	-	73	242
5	2	1	-	44	5186	6	-	-	7	274	5520
6	-	-	-	1	9	27	6	89	-	30	162
7	1	2	-	9	34	40	97	-	-	11	194
8	-	15	1	25	6	40	61	258	-	29	435
9	-	3	-	1	2	1	-	-	4	8	19
10	5	6	-	54	264	41	30	19	8	998	1425
Total	10	30	2	242	5520	162	194	435	19	1425	8039

Some significant stages in the calculation of Standard Score Z are given below. Logarithms to the base 10 have been used. The detail procedure of comparison is described in chapter three.

The sum of products of the 100 cell frequencies multiplied each by its logarithms for the matrix relating to control group, experimental group I MT and experimental group II FIACS all added together.	21318.451
The sum of the products of the 10 row totals multiplied each by its logarithms for the matrix relating to control group, experimental group I MT and experimental group II FIACS all added together.	24127.622
The sum of the products of 100 cell frequencies multiplied each by its logarithms for the matrix prepared by combining all the three matrices.	25886.888
The sum of the products of 10 row totals multiplied each by its logarithms for the matrix prepared by combining all the three matrices.	28705.684

$$X^2 = 42.610$$

$$Z = 2.473$$

The value of Z is less than the critical value of

2.58, the difference noticed therefore are not significant. This shows that the three matrices do not differ significantly.

4.2.3 Comparison of Variables for Significance

To be more sure the differences have been tested for significance by applying the 't' test, the formula and the procedure as indicated in chapter three and used in this chapter are as given by Garrett (1969).

TABLE 4.10

Control Versus Experimental Micro-Teaching Group I on the Basis of Pre-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variables	Control Group N = 10		Experimental Group I N = 5		't'
	M	SD	M	SD	
Teacher Talk	76.458	4.447	74.785	4.854	.619
Student Talk	5.950	4.555	5.865	4.793	.031
Silence/ Confusion	17.464	7.303	19.589	8.614	.465
T/S Ratio	55.856	101.358	23.626	20.155	.655
SSR	82.294	3.453	84.374	3.310	1.037
I/D	.046	.026	.050	.031	.250
i/d	.078	.091	.226	.155	2.154
Ext.Indirect	.049	.155	.049	.110	.004
Ext. Direct	3.320	1.588	.647	.798	3.300**
3-3 ⌘ Cell	.000	.000	.049	.110	1.316
9-9 Cell	.098	.239	.000	.000	.860

** Significant at .01 level

TABLE 4.11

Control Versus Experimental FIACS Group II on the Basis of Pre-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variables	Control Group N = 10		Experimental FIACS Group II N = 5		't'
	M	SD	M	SD	
Teacher Talk	76.458	4.447	78.870	9.589	.619
Student Talk	5.950	4.555	4.893	4.817	.386
Silence/ Confusion	17.464	7.303	16.531	12.208	.171
T/S Ratio	55.856	101.358	73.146	144.821	.249
SSR	82.294	3.453	84.571	4.681	.990
I/D	.046	.026	.036	.022	.687
i/d	.078	.091	.296	.399	1.528
Ext.Indirect	.049	.155	..000	.000	.658
Ext. Direct	3.320	1.598	1.194	1.301	2.410*
3-3 Cell	.000	.000	.000	.000	.000
9-9 Cell	.098	.239	.039	.089	.495

* Significant at .05 level.

TABLE 4.12

Experimental Micro-Teaching Group I Versus Experimental FIACS Group II on the Basis of the Pre-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variables	Experimental MT Group I		Experimental FIACS Group II		't'
	M	SD	M	SD	
Teacher Talk	74.785	4.854	78.870	9.589	.760
Student Talk	5.865	4.793	4.893	4.817	.285
Silence/ Confusion	19.589	8.614	16.531	12.208	.409
T/S Ratio	23.626	20.155	73.146	144.821	.677
SSR	84.374	3.310	84.571	4.681	.068
I/D	.050	.031	.036	.022	.741
i/d	.226	.155	.296	.399	.327
Ext.Indirect	.049	.110	.000	.000	.894
Ext. Direct	.647	.798	1.194	1.301	.717
3-3 Cell	.049	.110	.000	.000	.894
9-9 Cell	.000	.000	.039	.089	.894

4.3 Comparison of Pre-Treatment and Post-Treatment Interaction Matrices

As described in chapter three and earlier in this chapter Darwin's Likelihood Ratio Criterion Test was applied to test the two matrices with a view to ascertaining whether or not the sequential distributions contained in them are significantly different. In each case the third matrix was prepared through the process of cell by cell addition of the two matrices concerned.

4.3.1 Pre-Treatment and Post-Treatment Interaction Matrix Comparison of Control Group

Some of the stages in the calculation of Standard Score 'Z' are given below. Logarithm to the base 10 are used. Three matrices are given in Tables 4.13, 4.14, 4.15.

TABLE 4.13

Pre-Treatment Combined Interaction Matrix of Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	2	-	-	-	4	-	-	-	-	-	6
2	-	2	-	6	7	3	-	-	-	-	18
3	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	46	-	1	-	44	-	30	121
5	2	-	-	23	2524	5	-	-	7	129	2690
6	-	-	-	-	9	26	6	42	-	23	106
7	1	1	-	6	21	28	73	-	-	4	134
8	-	10	-	17	1	20	32	134	-	11	225
9	-	3	-	1	1	1	-	-	4	7	17
10	1	2	-	22	123	22	23	5	6	499	703
Total	6	18	-	121	2690	106	134	225	17	703	4020

TABLE 4.14

Post-Treatment Combined Interaction Matrix
of Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	-	-	-	-	-	-	-
2	-	36	13	23	3	1	1	10	-	-	87
3	-	-	52	10	27	1	2	2	-	3	97
4	-	5	1	734	-	-	4	283	-	85	1112
5	-	-	-	100	3626	12	-	-	1	83	3822
6	-	-	-	9	2	54	1	29	-	19	114
7	-	-	2	4	48	2	60	3	-	2	121
8	-	40	25	144	23	34	42	904	5	40	1257
9	-	1	1	-	2	-	2	-	2	2	10
10	-	5	3	88	91	10	9	26	2	1107	1341
Total	-	87	97	1112	3822	114	121	1257	10	1341	7961

TABLE 4.15

Pre and Post Treatment Combined Interaction Matrix of Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	2	-	-	-	4	-	-	-	-	-	6
2	-	38	13	29	10	4	1	10	-	-	105
3	-	-	52	10	27	1	2	2	-	3	97
4	-	5	1	780	-	1	4	327	-	115	1233
5	2	-	-	123	6150	17	-	-	8	212	6512
6	-	-	-	9	11	80	7	71	-	42	220
7	1	1	2	10	69	30	133	3	-	6	255
8	-	50	25	161	24	54	74	1038	5	51	1482
9	-	4	1	1	3	1	2	-	6	9	27
10	1	7	3	110	214	32	32	31	8	1606	2044
Total	6	105	97	1233	6512	220	255	1482	27	2044	11981

The sum of the products of the 100 cell frequencies multiplied each by its logarithm for the matrix relating to control group for pre-treatment and post-treatment all added together.	34811.556
The sum of the products of the 10 row totals multiplied each by its own logarithm for the matrix relating to control group for pre-treatment and Post-treatment all added together.	38863.256
The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrix prepared combining pre and post-treatment matrices of control group.	38456.480
The sum of the products of 10 row total multiplied each by its logarithm for the matrix prepared by combining pre and post-treatment matrices of control group.	41695.627

$$X^2 = 61.173$$

$$Z = 46.796$$

The value of 'Z' is more than the critical value of 2.58, the differences noticed therefore are significant.

Comparison of Variables for Significance

In order to have further probe the differences in

the variables have been tested for significance by applying the 't' test. To find out the value of 't' test the formula and procedure for calculating the significance of the difference between two correlated means was followed according to Garrett (1969, pp. 226-228).

TABLE 4.16

Pre-Treatment Versus Post-Treatment Data of Control Group

Summary of the 't' Test for Significance of Difference Between Means by Difference Method

Variable	Pre-Treatment M	Post-Treatment M	M_D	SD_D	SE_{MD}	't'
Teacher Talk	76.458	67.186	9.077	6.191	1.957	4.638**
Student Talk	5.950	15.995	10.045	4.803	1.518	6.617**
Silence/ Confusion	17.464	16.812	.699	10.064	3.182	.219
T/S Ratio	55.856	4.581	51.474	101.358	32.036	1.606
SSR	82.294	82.478	.183	3.485	1.102	.166
I/D	.046	.240	.193	.031	.009	21.444**
i/d	.078	.439	.371	.114	.003	123.666**
Ext.Indirect	.049	1.167	1.118	.443	.140	7.985**
Ext. Direct	3.320	1.466	1.853	2.047	.647	2.836*
3-3 Cell	.000	.652	.651	.363	.114	5.710**
9-9 Cell	.098	.111	.013	.170	.053	.245

* Significant at .05 level

** Significant at .01 level

4.3.2 Pre-Treatment and Post-Treatment Interaction Matrix Comparison of Experimental Micro-Teaching Group I

Some significant stages in the calculation of Standard Score 'Z' are given below. Logarithm to the base 10 are used. Three matrices are given in Tables 4.17, 4.18 and 4.19.

TABLE 4.17

Pre-Treatment Combined Interaction Matrix of Experimental Micro-Teaching Group I (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	3	-	-	-	-	-	3
2	-	1	-	2	-	3	-	-	-	-	6
3	-	-	1	-	1	-	-	-	-	-	2
4	-	-	-	25	-	-	-	5	-	23	53
5	-	-	-	10	1303	1	-	-	-	70	1384
6	-	-	-	1	-	1	-	30	-	4	36
7	-	-	-	2	5	3	9	-	-	1	20
8	-	4	1	1	3	15	8	71	-	11	114
9	-	-	-	-	1	-	-	-	-	-	1
10	3	1	-	12	68	13	3	8	1	283	392
Total	3	6	2	53	1384	36	20	114	1	392	2011

TABLE 4.18

Post-Treatment Combined Interaction Matrix of Experimental Micro-Teaching Group I (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	8	2	-	-	6	-	-	-	-	-	16
2	-	89	31	33	20	7	-	13	5	2	191
3	-	1	71	16	30	-	-	-	-	2	120
4	-	4	-	93	3	-	-	115	1	16	232
5	7	11	1	30	834	-	-	-	10	26	919
6	-	-	-	-	-	-	-	11	-	2	13
7	-	1	-	-	-	-	1	-	-	-	2
8	-	67	13	36	5	5	1	205	5	20	357
9	-	15	3	-	1	-	-	-	22	3	44
10	1	10	1	24	20	1	-	13	1	70	141
Total	16	191	120	232	919	13	2	357	44	141	2035

TABLE 4.19

Pre and Post Treatment Combined Interaction Matrix of Experimental Micro-Teaching Group I (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	8	2	-	-	9	-	-	-	-	-	19
2	-	81	31	35	20	10	-	13	5	2	197
3	-	1	72	16	31	-	-	-	-	2	122
4	-	4	118	3	-	-	-	120	1	49	285
5	7	11	1	40	2137	1	-	-	10	96	2303
6	-	-	-	1	-	1	-	41	-	6	49
7	-	1	-	2	5	3	10	-	-	1	22
8	-	71	14	37	8	20	9	276	5	31	471
9	-	15	3	-	2	-	-	-	22	3	45
10	4	11	1	36	88	14	3	21	2	353	533
Total	19	197	122	285	2303	49	22	471	45	533	4046

The sum of the products of the 100 cell frequencies multiplied each by its logarithm for the matrix relating to experimental micro-teaching group I for pre and post-treatment all added together.	9781.286
The sum of the products of 10 row totals multiplied each by its logarithms for the matrix prepared by combining pre and post-treatment matrices of experimental micro-teaching group.	11054.355
The sum of the products of 100 cell frequencies multiplied each by its logarithms for the matrix prepared by combining pre and post-treatment matrices of experimental micro-teaching Group I	10793.887
The sum of the products of 10 row totals multiplied each by its logarithms for the matrix prepared by combining pre and post-treatment matrices of experimental micro-teaching Group I.	12071.713

$$X^2 = 4.680$$

$$Z = 8.699$$

The value of 'Z' is more than the critical value of 2.58, differences noticed therefore are significant.

Comparison of Variables for Significance

TABLE 4.20

Pre-Treatment Versus Post-Treatment Data of Experimental Micro-Teaching Group I

Summary of the 't' Test for Significance of Difference Between Means by Differente Method

Variable	Pre-treatment M	Post-treatment M	M_D	SD_D	SE_{MD}	't'
Teacher Talk	74.785	73.340	.647	4.421	1.966	.337
Student Talk	5.865	19.691	13.826	6.374	2.850	4.851**
Silence/ Confusion	19.589	6.966	12.623	8.914	3.986	3.166*
T/S Ratio	23.626	3.821	19.825	20.200	9.033	2.194
SSR	84.374	67.990	16.383	4.476	2.001	8.187**
I/D	.050	.375	.325	.070	.031	10.516**
i/d	.226	.953	.726	.164	.073	9.945**
Ext.Indirect	.049	9.430	9.379	2.185	.977	9.599**
Ext. Direct	.647	.049	.698	.773	.345	2.023
3-3 Cell	.049	3.485	3.436	1.355	.605	5.679**
9-9 Cell	.000	1.079	1.079	.214	.095	11.357**

* Significant at .05 level
** Significant at .01 level

4.3.3 Pre-Treatment and Post-Treatment Interaction Matrix Comparison of Experimental FIACS Group II

Some significant stages in the calculation of Standard Score 'Z' are given below. Logarithm to the base 10 are used. The matrices are given in Tables 4.21, 4.22 and 4.23.

TABLE 4.21

Pre-Treatment Combined Interaction Matrix of Experimental FIACS Group II (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	1	-	-	-	-	-	1
2	-	-	-	2	2	-	-	-	-	2	6
3	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	27	1	-	-	20	-	20	68
5	-	1	-	11	1359	-	-	-	-	75	1446
6	-	-	-	-	-	-	-	17	-	3	20
7	-	1	-	1	8	9	15	-	-	6	40
8	-	1	-	7	2	5	21	53	-	7	96
9	-	-	-	-	-	-	-	-	-	1	1
10	1	3	-	20	73	6	4	6	1	216	330
Total	1	6	-	68	1446	20	40	96	1	330	2008

TABLE 4.22

Post-Treatment Combined Interaction Matrix of Experimental FIACS GROUP II (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	12	-	1	6	2	-	-	1	-	-	22
2	4	152	19	53	11	2	-	23	1	3	268
3	-	1	140	3	47	2	1	1	2	2	199
4	-	8	1	394	-	1	-	146	1	33	584
5	-	-	-	61	1627	11	-	-	6	22	1727
6	-	-	-	9	2	22	-	5	-	5	43
7	-	1	7	6	3	-	18	1	-	-	36
8	-	91	20	24	19	2	12	602	7	14	791
9	-	9	8	-	2	-	-	-	31	-	50
10	6	6	3	28	14	3	5	12	2	220	299
Total	22	268	199	584	1727	43	36	791	50	299	4019

TABLE 4.23

Pre and Post-Treatment Combined Interaction Matrix of Experimental FIACS GROUP II (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	12	-	1	6	3	-	-	1	-	-	23
2	4	152	19	55	13	2	-	23	1	5	274
3	-	1	140	3	47	2	1	1	2	2	199
4	-	8	1	421	1	1	-	166	1	53	652
5	-	1	-	72	2986	11	-	-	6	97	3173
6	-	-	-	9	2	22	-	22	-	8	63
7	-	2	7	7	11	9	33	1	-	6	76
8	-	92	20	31	21	7	33	655	7	21	887
9	-	9	8	-	2	-	-	-	31	1	51
10	7	9	3	48	87	9	9	18	3	436	629
Total	23	274	199	652	3173	63	76	887	51	629	6027

The sum of the products of the 100 cell frequencies multiplied each by its logarithm for the matrix relating to the experimental FIACS Group II for pre and post-treatment all added together.	15461.259
The sum of the products of the 10 row totals multiplied each by its own logarithm for the matrix relating to experimental FIACS Group II for pre-treatment and post-treatment all added together.	17382.296
The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrix prepared by combining pre and post-treatment matrices of experimental FIACS Group II.	17095.922
The sum of the products of 10 row totals multiplied each by its logarithm for the matrix prepared by combining pre and post-treatment matrices of experimental FIACS Group II.	18816.849

$$X^2 = 30.356$$

$$Z = 16.977$$

The value of 'z' is more than the critical value of 2.58, differences noticed therefore are significant.

Comparison of Variables for Significance

TABLE 4.24

Pre-Treatment Versus Post-Treatment Data of Experimental FIACS Group II

Summary of the 't' Tests for significance of Difference between Means by Difference Method

Variable	Pre-Treatment M	Post-Treatment M	M_D	SD_D	SE_{MD}	't'
Teacher Talk	78.870	71.642	7.028	8.574	3.834	1.833
Student Talk	4.893	20.868	15.974	6.145	2,748	5.812**
Silence/ Confusion	16.531	7.471	9.060	13.596	6.080	1.490
T/S Ratio	73.146	3.478	69.668	142.711	63.824	1.091
SSR	84.571	80.178	4.393	4.383	1.960	2.241
I/D	.036	.372	.336	.038	.016	21.000**
i/d	.296	.862	.566	.423	.189	2.994*
Ext.Indirect	.000	8.169	8.169	.836	.373	21.726**
Ext. Direct	1.194	.985	.229	1.553	.694	.329
3-3 Cell	.000	3.466	3.466	1.371	.613	56.541**
9-9 Cell	.039	.766	.726	.442	.197	3.685*

* Significant at .05 level
** Significant at .01 level

4.4 Inter Group Post-Treatment Interaction Matrix Comparison

In order to ascertain the significance of

differences among the control group, experimental micro-teaching group I and experimental FIACS group II, inter-group interaction matrix comparisons were made.

Below are given the results of the inter-group comparison of the interaction matrices.

Comparison of Post-Treatment Matrices of Control Group, Experimental Micro-Teaching Group I and Experimental FIACS Group II

Here again Darwin's Likelihood Ratio Criterion Test was applied to the two matrices with a view to ascertaining whether or not the sequential distributions contained in them are significantly differed. In each case the third matrix was prepared through the process of cell by all addition of two matrices concerned.

4.4.1 Post-Treatment Matrix Comparison of Control Group and Experimental Micro-Teaching Group I

Some of the stages in the calculations of Standard Score 'Z' are given below. Logarithm to the base 10 are used. Three matrices are given in Tables 4.25, 4.26 and 4.27.

TABLE 4.25

Post-Treatment Combined Interactions
Matrix Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	-	-	-	-	-	-	-
2	-	36	13	23	3	1	1	10	-	-	87
3	-	-	52	10	27	1	2	2	-	3	97
4	-	5	1	734	-	-	4	283	-	85	1112
5	-	-	-	100	3626	12	-	-	1	83	3822
6	-	-	-	9	2	54	1	29	-	19	114
7	-	-	2	4	48	2	60	3	-	2	121
8	-	40	25	144	23	34	42	904	5	40	1257
9	-	1	1	-	2	-	2	-	2	2	10
10	-	5	3	88	91	10	9	26	2	1107	1341
Total	-	87	97	1112	3822	114	121	1257	10	1341	7961

TABLE 4.26

Post-Treatment Combined Interaction Matrix of Experimental Micro-Teaching Group I (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	8	2	-	-	6	-	-	-	-	-	16
2	-	80	31	33	20	7	-	13	5	2	191
3	-	1	71	16	30	-	-	-	-	2	120
4	-	4	-	93	3	-	-	115	1	16	232
5	7	11	1	30	834	-	-	-	10	26	919
6	-	-	-	-	-	-	-	11	-	2	13
7	-	1	-	-	-	-	1	-	-	-	2
8	-	67	13	36	5	5	1	205	5	20	357
9	-	15	3	-	1	-	-	-	22	3	44
10	1	10	1	24	20	1	-	13	1	70	141
Total	16	191	120	232	919	13	2	357	44	141	2035

TABLE 4.27

Post-Treatment Combined Interaction Matrix of Combined Matrix of Control Group and Micro-Teaching Group (N = 15)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	8	2	-	-	6	-	-	-	-	-	16
2	-	116	44	56	23	8	1	23	5	2	278
3	-	1	123	26	57	1	2	2	-	3	217
4	-	9	1	827	3	-	4	398	1	101	1344
5	7	11	1	130	4460	12	-	-	11	109	4741
6	-	-	-	9	2	54	1	40	-	21	127
7	-	1	2	4	48	2	61	3	-	2	123
8	-	107	38	180	28	39	43	1109	10	60	1614
9	-	16	4	-	3	-	2	-	24	5	54
10	1	15	4	112	111	11	9	39	3	1177	1482
Total	16	278	217	1344	4741	127	123	1614	54	1482	9996

The sum of the products of the 100 cell frequencies multiplied each by its logarithm for the matrices relating to control group and experimental micro-teaching group I for post-treatment all added together.	28649.419
The sum of the products of the 10 row totals multiplied each by its own logarithm for the matrices relating to control group and experimental micro-teaching group I for post-treatment all added together.	31586.385
The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrix prepared by combining control and micro-teaching group I matrices for post-treatment.	30352.308
The sum of the products of 10 row totals multiplied each by its logarithm for the matrix prepared by combining control and micro-teaching group I matrices for post-treatment.	33231.142

$$X^2 = 16.665$$

$$Z = 3.286$$

The value of 'Z' is more than the critical value of 2.58, the differences noticed therefore are significant.

Some of the matrices have been repeatedly given

with a view to provide ready reference to reader.

Comparison of Variables for Significance

Here again with a view to have further probe into the differences on various variables 't' test was used to find the significance of differences. The formula and procedure employed has already been indicated.

TABLE 4.28

Control Versus Experimental Micro-Teaching Group I on the Basis of Post-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variables	Control Group N = 10		Experimental MT Group N=5		't'
	M	SD	M	SD	
Teacher Talk	67.106	4.960	73.340	2.647	2.416*
Student Talk	15.995	4.224	19.691	3.125	1.613
Silence/Confusion	16.812	12.208	6.966	1.307	2.701*
T/S Ratio	4.581	2.030	3.821	.780	.751
SSR	82.478	1.878	67.990	3.082	10.481**
I/D	.240	.040	.375	.074	4.211**
i/d	.439	.013	.953	.023	14.182**
Ext.Indirect	1.167	.499	9.430	2.187	10.581**
Ext.Direct	1.466	.784	.049	.110	3.742**
3-3 Cell	.652	.344	3.485	1.371	5.701**
9-9 Cell	.111	.122	1.079	.216	10.272**

* Significant at .05 level ** Significant at .01 level

4.4.2 Post-Treatment Interaction Matrix Comparison of Control Group and Experimental FIACS Group II

Some of the stages in the calculations of Standard Score 'Z' are given below. Logarithm to the base 10 are

used. Three matrices are given in Tables 4.29, 4.30 & 4.31.

TABLE 4.29

Post-Treatment Combined Interaction Matrix
Control Group (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	-	-	-	-	-	-	-
2	-	36	13	23	3	1	1	10	-	-	87
3	-	-	52	10	27	1	2	2	-	3	97
4	-	5	1	734	-	-	4	283	-	85	1112
5	-	-	-	100	3626	12	-	-	1	83	3822
6	-	-	-	9	2	54	1	29	-	19	114
7	-	-	2	4	48	2	60	3	-	2	121
8	-	40	25	144	23	34	42	904	5	40	1257
9	-	1	1	-	2	-	2	-	2	2	10
10	-	5	3	88	91	10	9	26	2	1107	1341
Total	-	87	97	1112	3822	114	121	1257	10	1341	7961

TABLE 4.30

Post-Treatment Combined Interaction Matrix of Experimental FIACS Group II (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	12	-	1	6	2	-	-	1	-	-	22
2	4	152	19	53	11	2	-	23	1	3	268
3	-	1	140	3	47	2	1	1	2	3	199
4	-	8	1	394	-	1	-	146	1	33	584
5	-	-	-	61	1627	11	-	-	6	22	1727
6	-	-	-	9	2	22	-	5	-	5	43
7	-	1	7	6	3	-	18	1	-	-	36
8	-	91	20	24	19	2	12	602	7	14	691
9	-	9	8	-	2	-	-	-	31	-	50
10	6	6	3	28	14	3	5	12	2	220	299
Total	22	268	199	584	1727	43	36	791	50	299	4019

TABLE 4.31

Post-Treatment Combined Interaction Matrix of the Combined Matrices Control and FIACS GROUP II (N = 15)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	12	-	1	6	2	-	-	1	-	-	22
2	4	188	32	76	14	3	1	33	1	3	355
3	-	1	192	13	74	3	3	3	2	5	296
4	-	3	2	1128	-	1	4	429	1	118	1696
5	-	-	-	161	5253	23	-	-	7	105	5549
6	-	-	-	18	4	76	1	34	-	24	157
7	-	1	9	10	51	2	78	4	-	2	157
8	-	131	45	168	42	36	54	1504	12	54	2048
9	-	10	9	-	4	-	2	-	33	2	60
10	6	11	6	116	105	13	14	38	4	1327	1640
Total	22	355	296	1696	5549	157	157	2048	60	1640	11980

The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrices relating to control group and experimental FIACS group II for post-treatment all added together.	34303.696
The sum of the products of the 10 row totals multiplied each by its own logarithm for the matrices relating to control group and experimental FIACS group II for post-treatment all added together.	37894.767
The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrix prepared by combining control and experimental FIACS group II for post-treatment.	37568.662
The sum of the products of 10 row totals multiplied each by its logarithm for the matrix prepared by combining control and experimental FIACS group II matrices for post-treatment.	40960.482

$$X^2 = 41.443$$

$$Z = 28.064$$

The value of 'Z' is more than the criterion value of 2.58, differences noticed therefore are significant.

TABLE 4.32

Control Versus Experimental FIACS Group II on the Basis of Post-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variables	Control Group N = 10		Experimental FIACS GROUP N = 5		't'
	M	SD	M	SD	
Teacher Talk	67.186	4.960	71.642	2.243	1.780
Student Talk	15.995	4.224	20.868	2.564	2.206*
Silence/Confusion	16.812	7.530	7.471	2.303	2.523*
T/S Ratio	4.581	2.030	3.478	.475	1.115
SSR	82.478	1.878	80.178	.863	2.424*
I/D	.240	.040	.372	.027	6.042**
i/d	.439	.073	.862	.025	11.655**
Ext.Indirect	1.167	.499	8.169	.837	18.812**
Ext. Direct	1.466	.784	.985	.378	1.207
3-3 Cell	.652	.344	3.466	1.370	5.691**
9-9 Cell	.111	.122	.766	.488	3.713**

* Significant at .05 level
** Significant at .01 level

4.4.3 Post-Treatment Matrix Comparison of Experimental Micro-Teaching Group I and Experimental FIACS Group II

Some of the stages in the calculation of Standard

Score 'Z' are given below. Logarithm to the base 10 are used. Three matrices are given in Tables 4.33, 4.34 and 4.35.

TABLE 4.33

Post-Treatment Combined Interaction Matrix of Experimental Micro-Teaching Group I (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	8	2	-	-	6	-	-	-	-	-	16
2	-	80	31	33	20	7	-	13	5	2	191
3	-	1	71	16	30	-	-	-	-	2	120
4	-	4	-	93	3	-	-	115	1	16	232
5	7	11	1	30	834	-	-	-	10	26	919
6	-	-	-	-	-	-	-	11	-	2	13
7	-	1	-	-	-	-	1	-	-	-	2
8	-	67	13	36	5	5	1	205	5	20	357
9	-	15	3	-	1	-	-	-	22	3	44
10	1	10	1	24	20	1	-	13	1	70	141
Total	16	191	120	232	919	13	2	357	44	141	2035

TABLE 4.34

Post-Treatment Combined Interaction Matrix of Experimental FIACS Group II (N = 5)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	12	-	1	6	2	-	-	1	-	-	22
2	4	152	19	53	11	2	-	23	1	3	268
3	-	1	140	3	47	2	1	1	2	2	199
4	-	8	1	394	-	1	-	146	1	33	584
5	-	-	-	61	1627	11	-	-	6	22	1727
6	-	-	-	9	2	22	-	5	-	5	43
7	-	1	7	6	3	-	18	1	-	-	36
8	-	91	20	24	19	2	12	602	7	14	791
9	-	9	8	-	2	-	-	-	31	-	50
10	6	6	3	28	14	3	5	12	2	220	299
Total	22	268	199	584	1727	43	36	791	50	299	4019

TABLE 4.35

Post-Treatment Combined Interaction Matrix of Combined Matrices of Micro-Teaching and FIACS (N = 10)

Category	1	2	3	4	5	6	7	8	9	10	Total
1	20	2	1	6	8	-	-	1	-	-	38
2	4	432	50	86	31	9	-	36	6	5	659
3	-	2	211	19	77	2	1	1	2	4	419
4	-	12	1	487	3	1	-	261	2	49	816
5	7	11	1	91	2461	11	-	-	16	48	2646
6	-	-	-	9	2	22	-	16	-	7	56
7	-	2	7	6	3	-	19	1	-	-	38
8	-	158	33	60	24	7	13	867	12	34	1148
9	-	24	11	-	3	-	-	-	53	3	94
10	7	16	4	52	34	4	5	25	3	290	440
Total	38	659	419	816	2646	56	38	1148	94	440	6054

The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrices relating to experimental micro-teaching group I and experimental FIACS group II for post-treatment all added together.	14518.225
The sum of the products of 10 row totals multiplied each by its own logarithm for the matrices relating to experimental micro-teaching group I and experimental FIACS group II for post-treatment all added together.	16863.438
The sum of the products of 100 cell frequencies multiplied each by its logarithm for the matrix prepared by combining experimental micro-teaching group I and experimental FIACS group II matrices for post-treatment.	16677.346
The sum products of 10 row totals multiplied each by its logarithm for the matrix prepared by combining experimental micro-teaching group I and experimental FIACS group II matrices for post-treatment.	19464.822

$$X^2 = 45.127$$

$$Z = 31.478$$

The value of 'Z' is more than the criterion value of 2.58, differences noticed therefore are significant.

TABLE 4.36

Experimental Micro-Teaching Group I Versus Experimental FIACS Group II on the Basis of Post-Treatment Data

Summary of the 't' Tests for Significance of Difference Between Means

Variables	Experimental MT Group N=5		Experimental FIACS Group II N = 5		't'
	M	SD	M	SD	
Teacher Talk	73.340	2.647	71.642	2.243	.798
Student Talk	19.691	3.125	20.868	2.564	.582
Silence/ Confusion	6.966	1.307	7.471	2.303	.381
T/S Ratio	3.821	.780	3.478	.475	.750
SSR	67.990	3.082	80.170	.883	7.615**
I/D	.375	.074	.372	.027	.080
i/d	.953	.023	.862	.025	5.196**
Ext.Indirect	9.430	2.187	8.169	.837	1.077
Ext. Direct	.049	.110	.985	.378	4.755**
3-3 Cell	3.485	1.371	3.466	1.370	.020
9-9 Cell	1.079	.216	.766	.488	1.171

** Significant at .01 level

SECTION III

4.5 Micro-Teaching Results

In order to be more sure of the efficacy of micro-teaching compared to the traditional method of training and FIACS treatment it was considered advisable to assess the extent of modification of student-teacher behaviour at the treatment stages, namely teach, first reteach and second reteach in actual classroom situation. To see the significant differences on the mean scores of the 11 variables the comparisons have been made between teach and first reteach, between teach and second reteach, and first reteach and second reteach:

4.5.1 Comparison Between Teach and First Reteach

TABLE 4.37

4.5.2 Comparison Between Teach and Second Reteach

TABLE 4.38

4.5.3 Comparison Between First Reteach and Second Reteach

TABLE 4.39

TABLE 4.37

Summary of 't' Test for Significance of Difference Between Means for Comparison Between Teach and First Reteach

Variables	Teach M	First Reteach M	M_D	SD_D	SE_{MD}	't'
Teacher Talk	65.163	61.471	3.691	4.359	1.949	1.893+
Student Talk	28.706	33.700	4.993	4.949	2.213	2.256+
Silence/Confusion	6.132	5.036	1.095	1.384	.618	1.771+
T/S Ratio	2.329	1.852	.487	.529	.236	2.036+
SSR	70.290	66.237	4.053	2.598	1.161	3.490*
I/D	.472	.513	.161	.015	.006	26.833**
i/d	.788	.938	.150	.041	.018	8.333**
Ext.Indirect	6.839	11.671	4.831	.969	.433	11.157**
Ext.Direct	1.328	.143	1.185	.336	.150	7.900**
3-3 Cell	2.824	5.234	2.409	1.732	.774	3.112*
9-9 Cell	.569	1.485	.916	.298	.012	76.333**

* Significant at .05 level
** Significant at .01 level
\+ Not significant

TABLE 4.38

Summary of 't' Tests for Significance of Difference Between Means for Comparison Between Teach and Second Reteach

Variables	Teach M	First Re-teach M	M_D	SD_D	SE_{MD}	't'
Teacher Talk	65.163	59.433	5.728	3.666	1.639	3.491*
Student Talk	28.706	36.538	7.632	3.937	1.790	4.263**
Silence/Confusion	6.132	4.015	2.116	1.324	.592	3.550*
T/S Ratio	2.329	1.637	.701	1.118	.500	1.402+
SSR	70.290	63.668	6.621	2.121	.948	6.984**
I/D	.472	.689	.217	.022	.009	24.111**
i/d	.788	.930	.142	.022	.009	15.777**
Ext. Indirect	6.839	13.428	6.589	1.407	.629	10.475**
Ext. Direct	1.328	.000	1.328	.362	.161	8.248**
3-3 Cell	2.824	5.955	3.130	1.581	.707	4.427*
9-9 Cell	.569	2.227	1.858	.963	.430	4.320*

* Significant at .05 level
** Significant at .01 level
\+ Not significant

TABLE 4.39

Summary of 't' Tests for Significance of Difference Between Means for Comparison Between First Reteach and Seconda Reteach

Variables	First Reteach M	Second Re-teach M	M_D	SD_D	SE_{MD}	't'
Teacher Talk	61.471	59.433	2.874	3.354	1.500	1.916+
Student Talk	33.700	36.538	2.838	2.550	1.140	2.489+
Silence/Confusion	5.036	4.015	1.051	1.340	.599	1.754+
T/S Ratio	1.852	1.637	.251	.321	.143	1.503+
SSR	66.237	63.668	2.569	2.291	1.024	2.508+
I/D	.513	.689	.176	.289	.129	1.364+
i/d	.938	.930	.050	.035	.015	.666+
Ext. Indirect	11.671	13.428	1.757	1.803	.806	2.179+
Ext. Direct	.143	.000	.143	.319	.142	1.007+
3-3 Cell	5.234	5.955	.721	1.531	.684	1.054+
9-9 Cell	1.485	2.227	.742	.799	.357	2.078+

+ Not significant

4.5.4 Comparative Results of Teach, First Reteach and Second Reteach

In order to have a comparative results of teach, first reteach, and second reteach for different variables showing the spurt of growth i.e. decrease or increase in different variables having teach indices as common Denominator a common scale was found out by using the formula

$$\frac{\text{First Reteach}}{\text{Teach}} \times 100 \text{ or } \frac{\text{Second Reteach}}{\text{Teach}} \times 100 \text{ for}$$

each variable.

TABLE 4.40

4.5.5 Modification of Verbal Behaviour on Variables at Different Stages

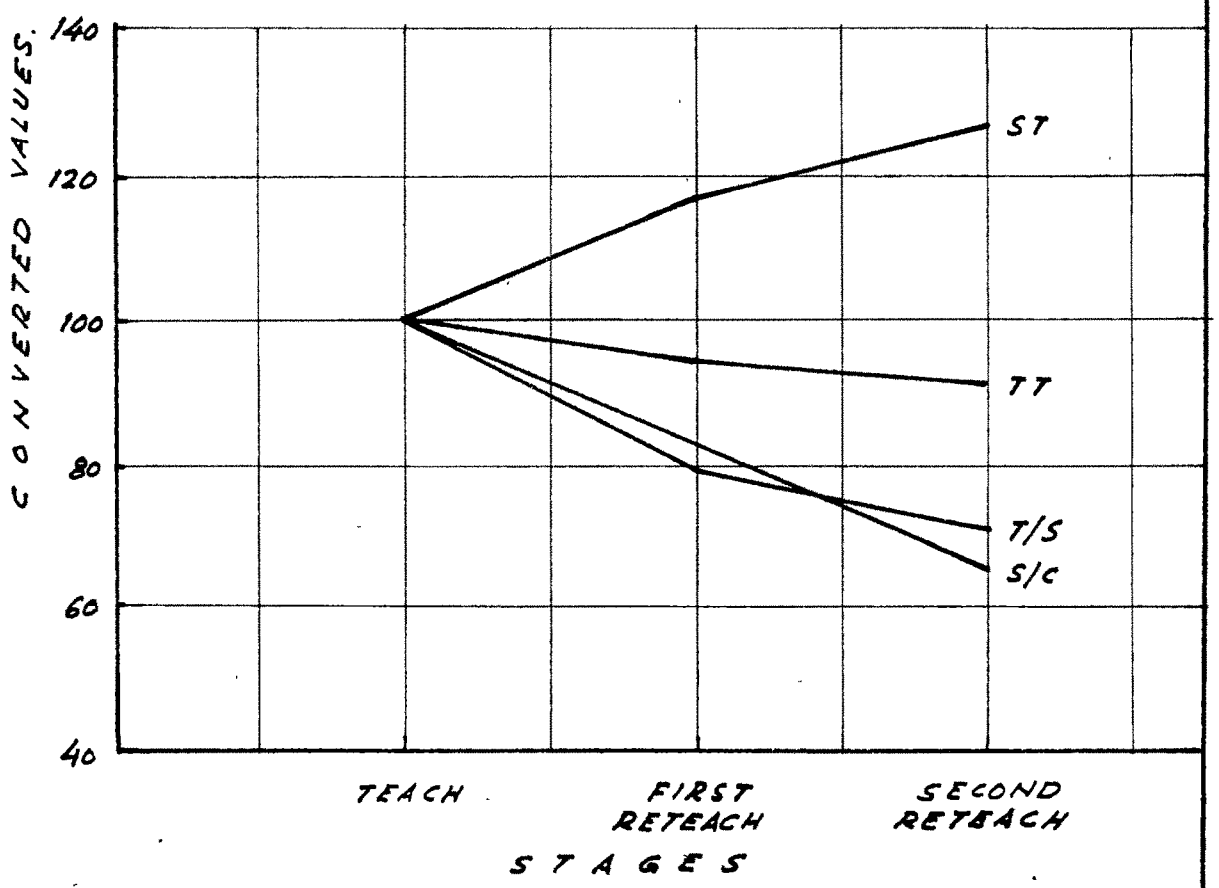
With a view to seeing the continuity in increase or decrease of certain variables in classroom verbal behaviour of student-teachers, the phenomena has been shown on graphs based on the measures of converted values ~~in~~ in column 3, 5 and 7 of Table 4.40. In order to economise the pages, the variables are grouped into three clusters and each cluster is presented in one graph such as variables of 'teacher talk', 'student talk', 'silence or confusion' and 'teacher student talk ratio' in Graph 4.1, variables 'steady state ratio', 'I/D', 'i/d', 'extended Indirect', and 'extended direct' in Graph 4.2, and categories in '3-3' and '9-9' cells in Graph 4.3.

TABLE 4.4

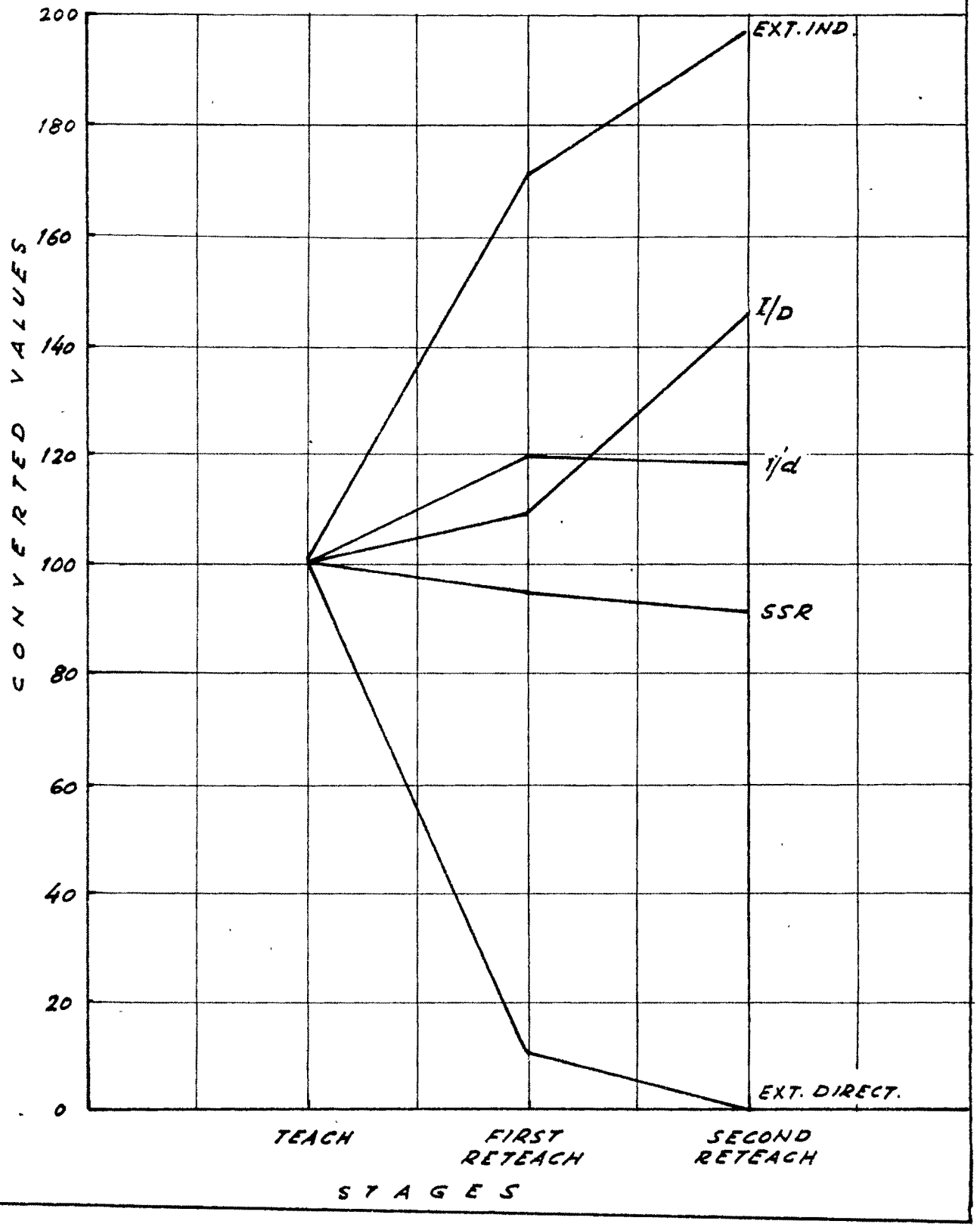
Results of Converted Values at Teach, First Reteach and Second Reteach Stages

Variables	Teach	Converted teach values with base teach	First Reteach	Converted first teach values with base teach	Second Reteach	Converted second re-teach values with base teach
Teacher Talk	65.163	100.00	61.471	94.334	59.433	91.206
Student Talk	28.706	100.00	33.700	117.397	36.538	127.283
Silence/Confusion	6.132	100.00	5.036	82.126	4.015	65.476
T/S Ratio	2.329	100.00	1.852	79.519	1.637	70.287
SSR	70.290	100.00	66.237	94.233	63.668	90.579
I/D	.472	100.00	.513	108.686	.689	145.974
i/d	.788	100.00	.938	119.035	.930	118.020
Ext. Indirect	6.839	100.00	11.671	170.653	13.428	196.344
Ext. Direct	1.328	100.00	.143	10.768	.000	.000
3-3 Cell	2.824	100.00	5.234	105.339	5.995	210.871
9-9 Cell	.569	100.00	1.485	260.984	2.227	391.388

GRAPH 4-1 SHOWING THE EXTENT OF THE MODIFICATION OF VERBAL BEHAVIOUR ON THE VARIABLES OF 'TT', 'ST', 'S/C' AND 'T/S' RATIO



GRAPH 4-2 SHOWING THE EXTENT OF THE MODIFICATION OF VERBAL BEHAVIOUR ON THE VARIABLES OF SSR, I/D, i/d, EXT. IND. AND EXT. DIRECT



GRAPH 4-3 SHOWING THE EXTENT OF MODIFICATION OF VERBAL BEHAVIOUR ON THE VARIABLES OF CATEGORIES IN 3-3 CELL AND 9-9 CELL