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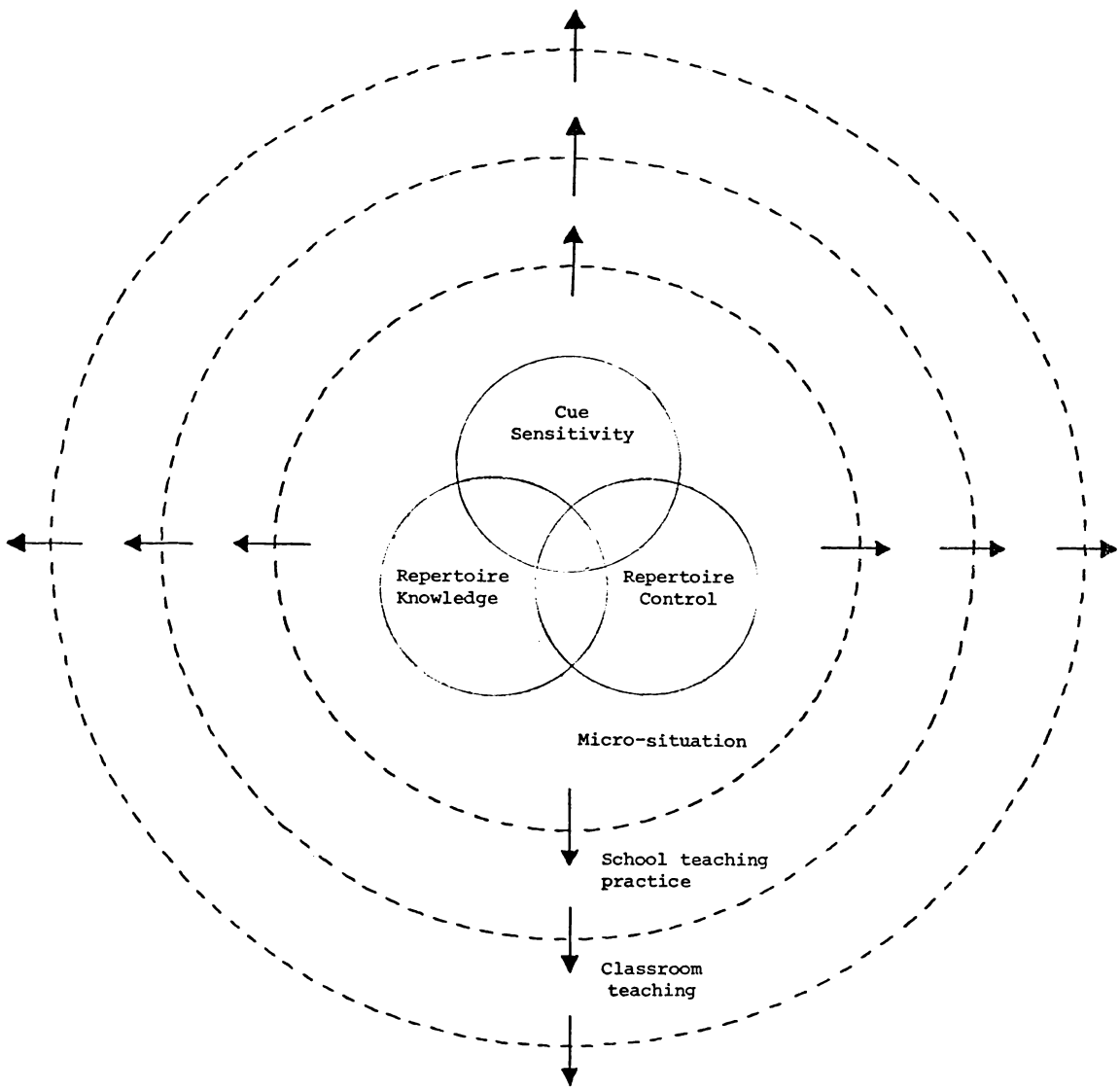


FIG. 2.1 Model for Developing Teaching Competence through Microteaching.

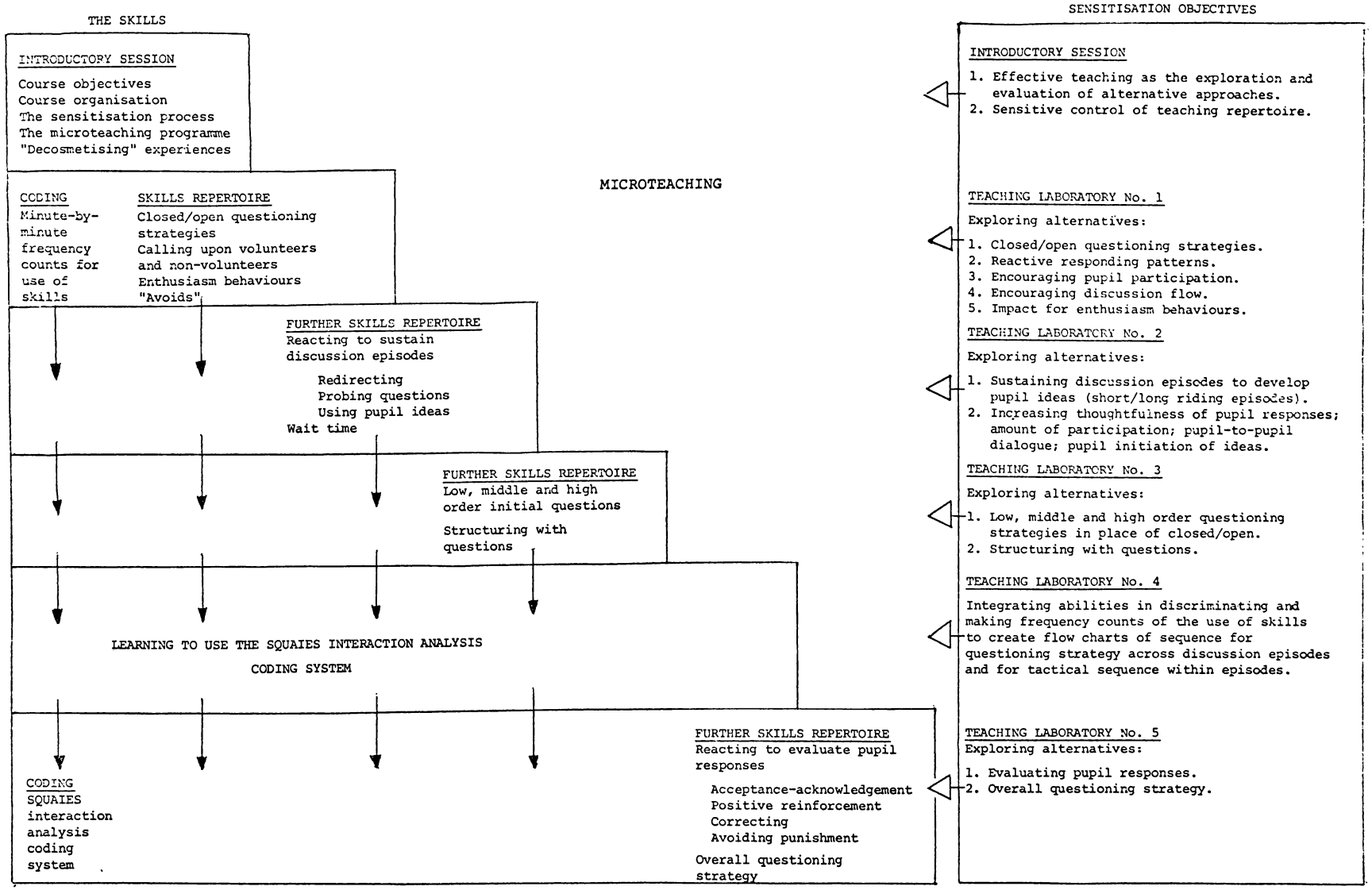


FIG. 4.1 Microteaching Curriculum: Cumulative Sensitisation Experience in the Microteaching Laboratories.

WEEKS	DATES	TEACHING LABS.	SESSIONS	ACTIVITIES
1	FEB. 25/ MAR. 1	INTRODN.	1	Introduction. Objectives. Organisation.
		NO.1	2	Skills study. Teaching sample analysis. Exercises. Microteaching organisation.
2	MAR. 4/8		3	Microteaching.
			4	Microteaching.
3	MAR. 11/15	NO.2	5	Skills study. Teaching sample analysis. Exercises. Microteaching organisation.
			6	Microteaching.
4	MAR. 18/22		7	Microteaching.
		NO.3	8	Skills study. Teaching sample analysis. Exercises. Microteaching organisation.
5	MAR. 22/29		9	Microteaching.
			10	Microteaching.
6	APR. 1/5		11	Microteaching (reteach).
			12	Microteaching (reteach).
7/8	APR. 8/19	NO.4	13	The SQUAIES Interaction Analysis Coding System.
			14	" " " " "
9	APR. 22/26		15	" " " " "
		NO.5	16	Skills study. Teaching sample analysis. Exercises. Microteaching organisation.
10	APR. 29/ MAY 3		17	Microteaching.
			18	Microteaching.
11	MAY 6/10		19	Microteaching.
			20	Completion of opinion questionnaire.

FIG. 4.2 The Organisational Schedule for Microteaching.

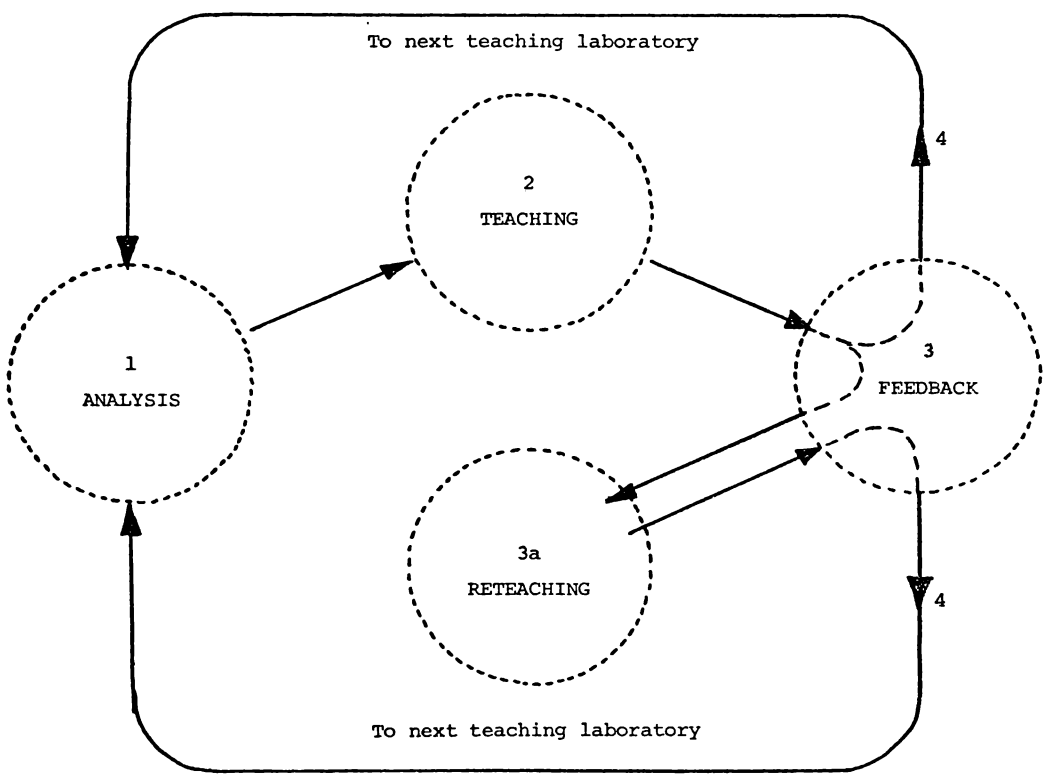


FIG. 4.3 The Microteaching Format.

SESSION ONE - Analysis	Minutes
1. Discussion of the cluster of skills	15 - 20
2. Analysis of taped samples of teaching Part 1: Cued sample Transcript of cued sample Part 2: Uncued sample	45 - 50
3. Discrimination exercises 4. Discussion of alternatives - planning	15 - 20
SESSION TWO - Practice and Feedback Three microteach sessions by three different microteachers - 30 minutes each	90
SESSION THREE - Practice and Feedback Three microteach sessions by next three microteachers - 30 minutes each	90

FIG. 4.4 Activities in the Analysis, Practice and Feedback Phases of a Microteaching Laboratory.

Minutes	First microteacher	Second microteacher	Third microteacher
5 - 10	Microteach	Repeat sequence	Repeat sequence
5 - 10	Replay of tape for data collection and recording ready for feedback		
10	Feedback discussion		
30		30	30

FIG. 4.5 A Microteaching Session.

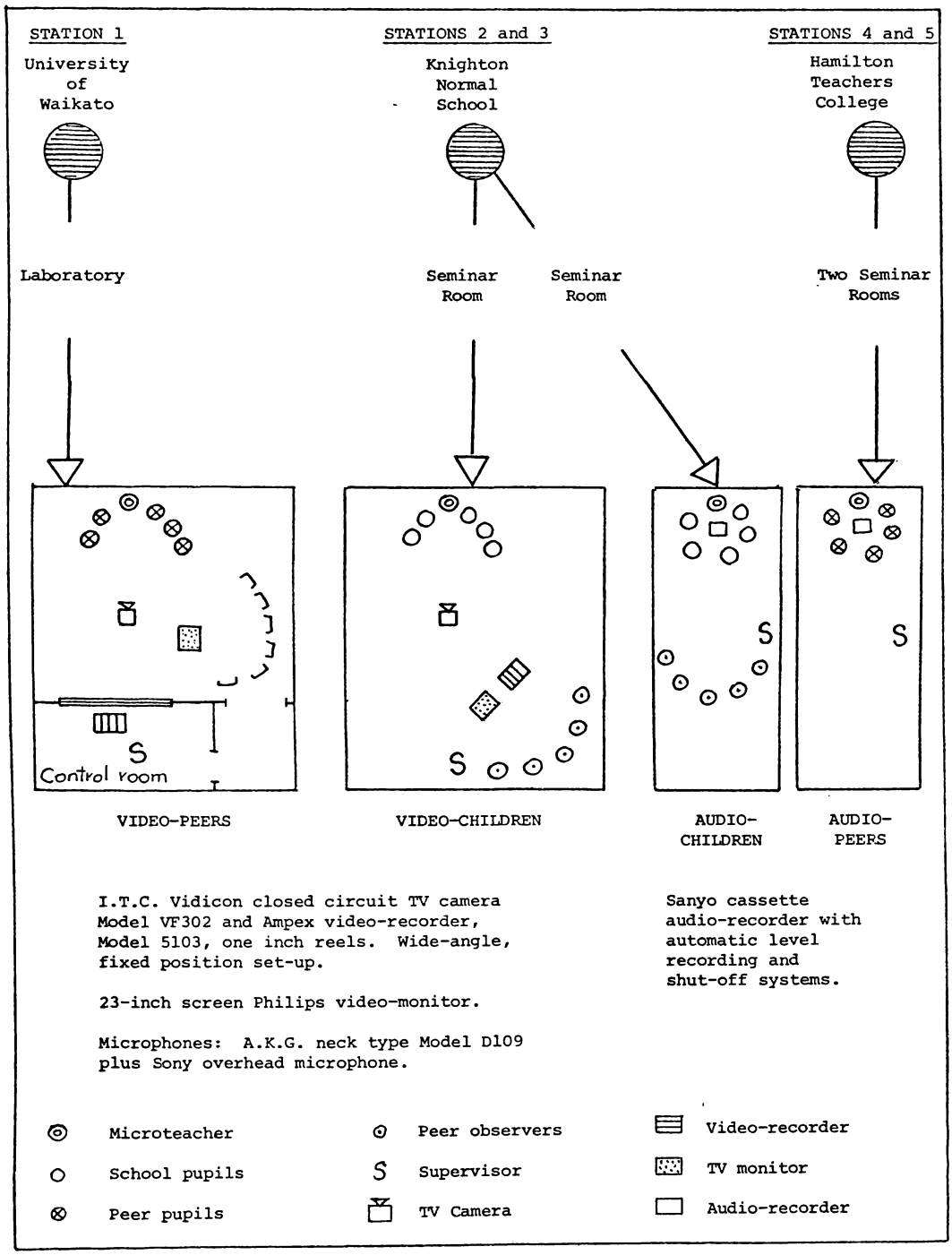


FIG. 4.6 Microteaching Stations.

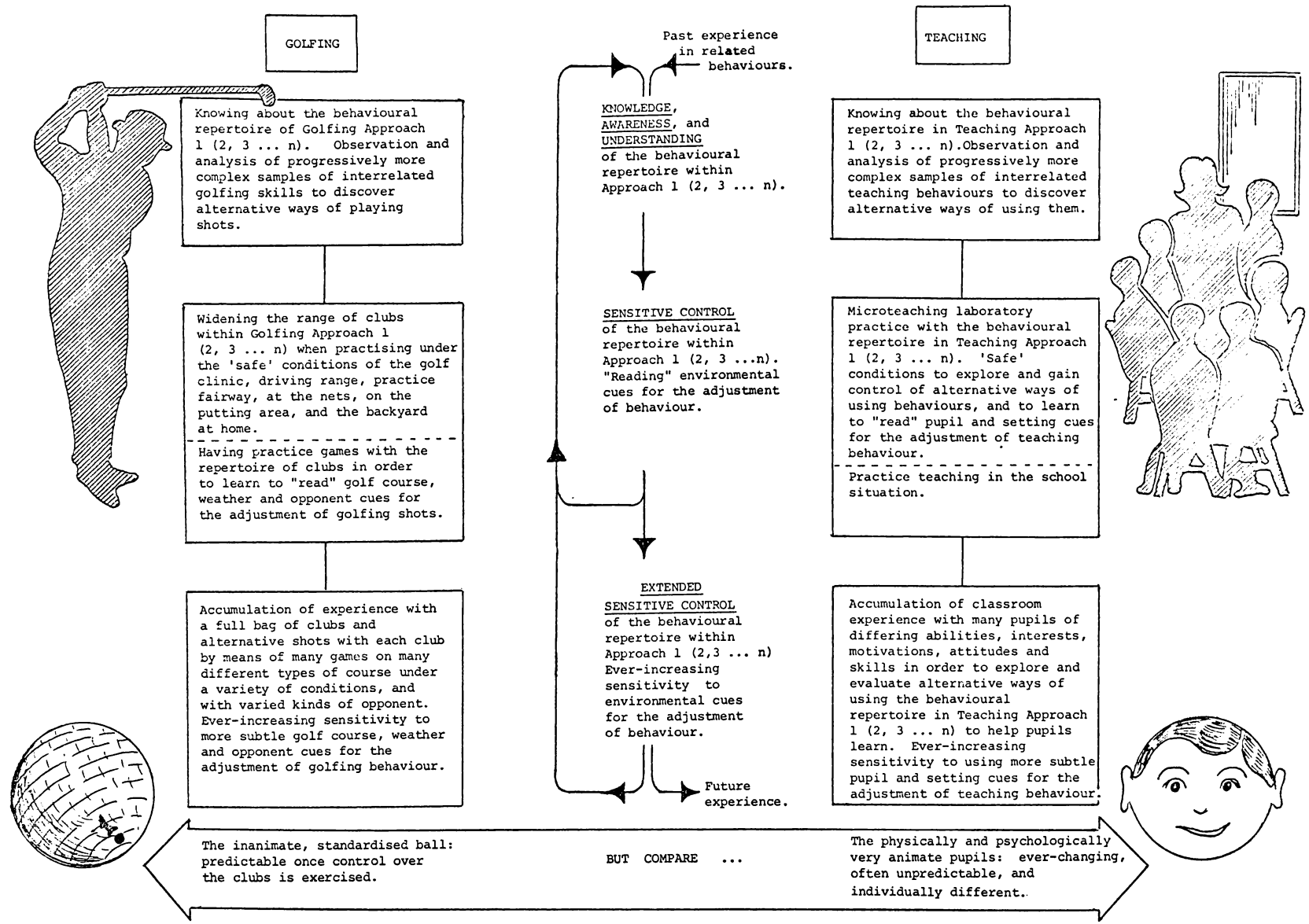
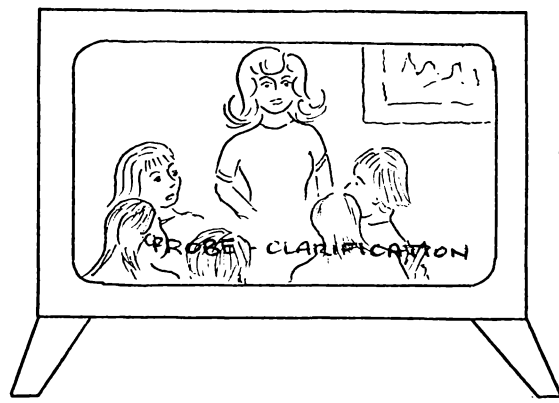


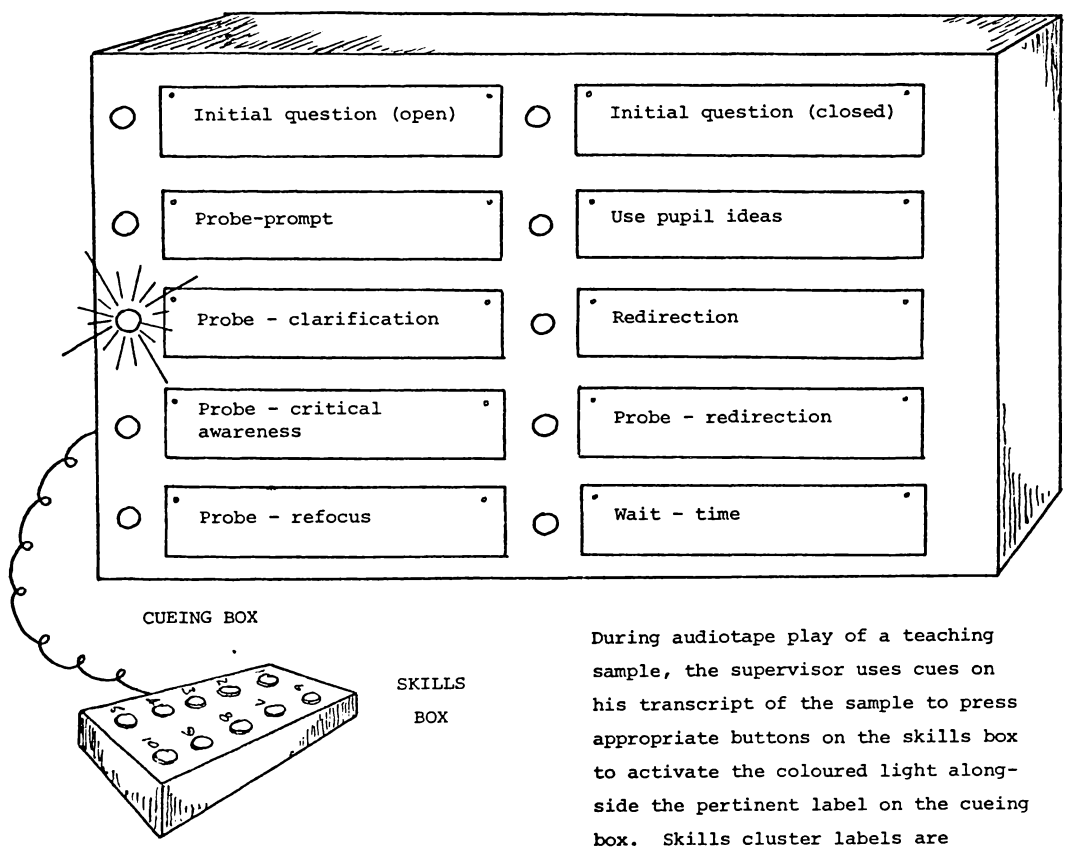
FIG. 4.7 Sensitive Control of Behavioural Repertoire: Golfing and Microteaching.

(a) For treatment groups having the support of videotape technology:



TELEVISION MONITOR

(b) For treatment groups having the support of audiotape technology:



During audiotape play of a teaching sample, the supervisor uses cues on his transcript of the sample to press appropriate buttons on the skills box to activate the coloured light alongside the pertinent label on the cueing box. Skills cluster labels are changed laboratory to laboratory.

FIG. 4.8 Cueing of Teaching Samples in the Analysis Phase of the Microteaching Format.

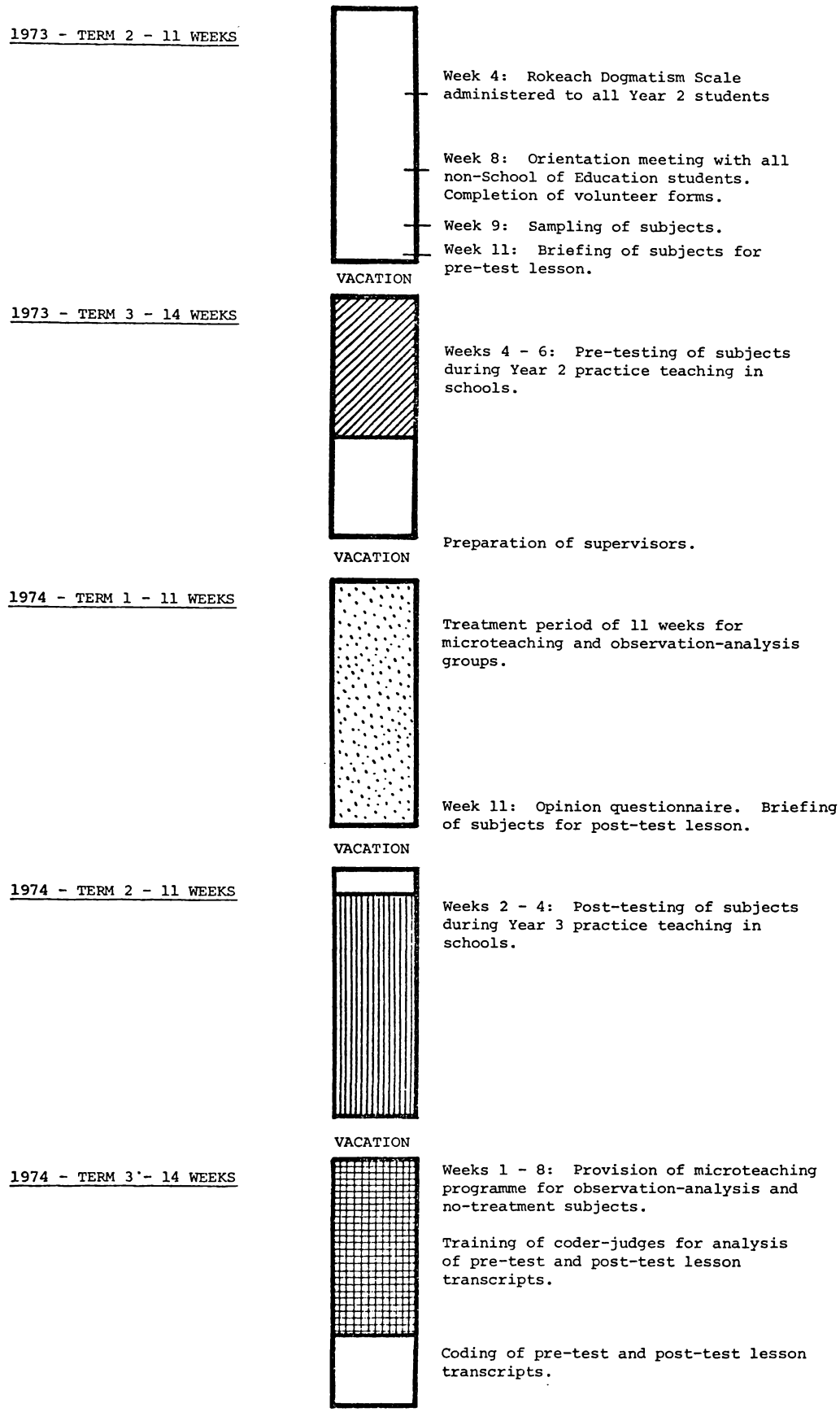


FIG. 6.1 The Organisational Schedule for the Experimental Study.

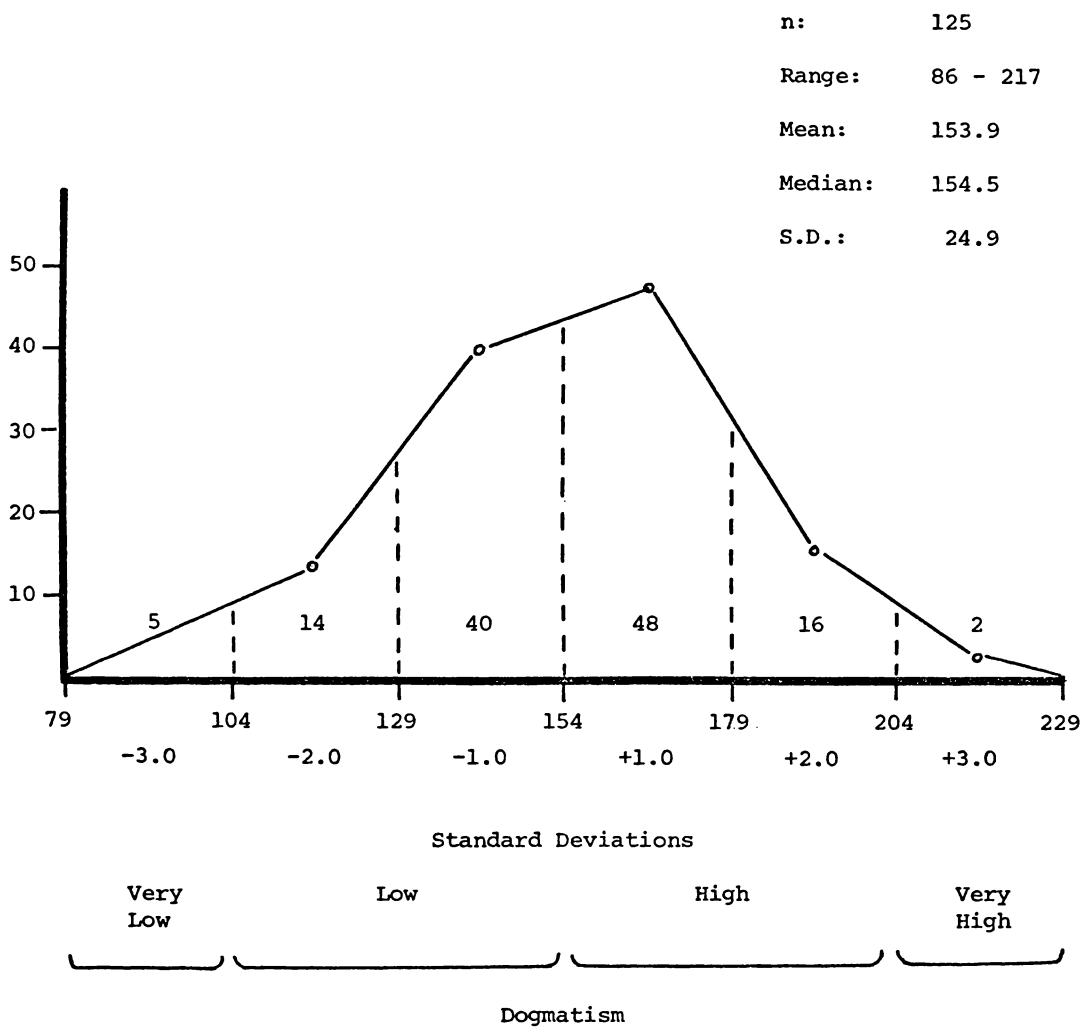


FIG. 6.2 Distribution of Dogmatism Scores for Subjects Assigned to Experimental Treatments and as "Spares".

Week 4, Term 2, 1973

Administering of the Rokeach Dogmatism Scale Form E to whole of the Year 2 Intake (n = 331).

→ Elimination of School of Education students (n = 120).

Stratification of non-School of Education students (n = 211) into Very High, High, Low and Very Low dogmatism levels.

Week 8, Term 2, 1973

Orientation meeting with non-School of Education population: Briefing on the Teaching Skills Course, 1974. Completion of application forms for consideration as a course member on a random draw basis.

Week 9, Term 2, 1973

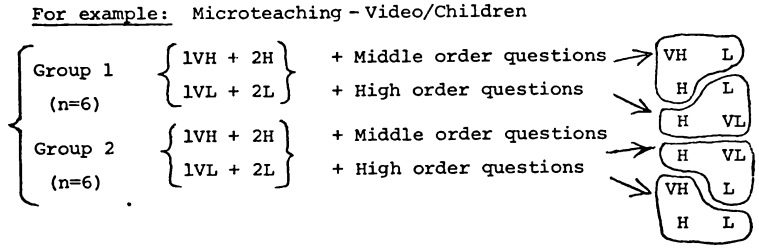
1. Stratified random selection of the sample as a whole, requiring 16 Very High, 32 High, 32 Low, and 16 Very Low dogmatism scorers (plus "spares" for each category.

2. Stratified random assignment of the sample to main experimental treatments according to the n requirements:

	Very High	High	Low	Very Low	
Microteaching	8	16	16	8	(48)
Observation-analysis	4	8	8	4	(24)
No treatment	4	8	8	4	(24)
					(96)

3. Where applicable, stratified random assignment of the main treatment stratified samples to treatments within main treatment groups.

For example: Microteaching - Video/Children



For example: Observation-analysis

Video:	2VH	4H	2VL	4L
Audio:	2VH	4H	2VL	4L

FIG. 6.3 The Stratified Randomisation Procedure for Selection and Assignment of Subjects to Treatment Groups.

TABLE 6.1 Adherance of Microteachers to Assigned Conditions of Practising Middle Order or High Order Questions

Microteaching Treatments	Per cent adhering to practice condition	
	Middle order questions	High order questions
All microteachers	82.4	83.6
Video/peers	75.0	97.1
Audio/peers	79.0	83.5
Video/children	81.9	80.0
Audio/children	91.5	76.3
Video	78.9	88.5
Audio	85.1	79.7
Teaching children	87.0	78.1
Teaching peers	77.5	89.9

TABLE 6.2 Attendance of Microteaching and Observation-analysis Participants at Laboratory Sessions

Treatment groups	Number of groups	Per cent attendance range for groups	Median per cent attendance
MICROTEACHING:			
All microteachers	8	93.3 - 100.0	95.4
Video	4	93.4 - 100.0	94.2
Audio	4	94.2 - 97.5	96.7
Teaching children	4	93.3 - 96.7	94.2
Teaching peers	4	94.2 - 100.0	97.1
Middle order questions	4	90.0 - 100.0	95.9
High order questions	4	91.7 - 100.0	95.9
OBSERVATION-ANALYSIS:			
Both groups	2	85.4 - 88.9	87.2
Video	1	85.4	
Audio	1	88.9	

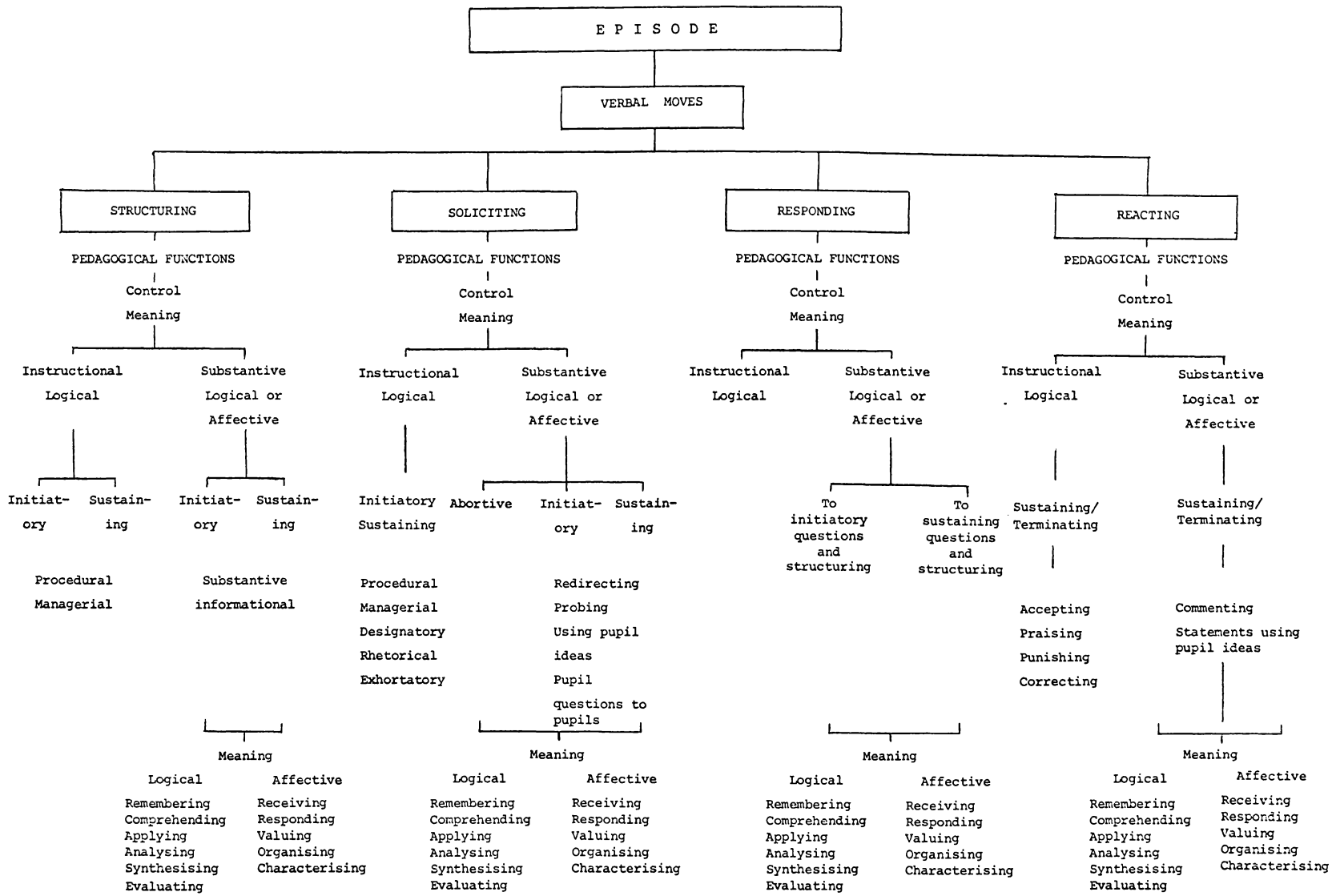


FIG. 7.1 The Theoretical Model for the SQUAIES Interaction Analysis Coding System.

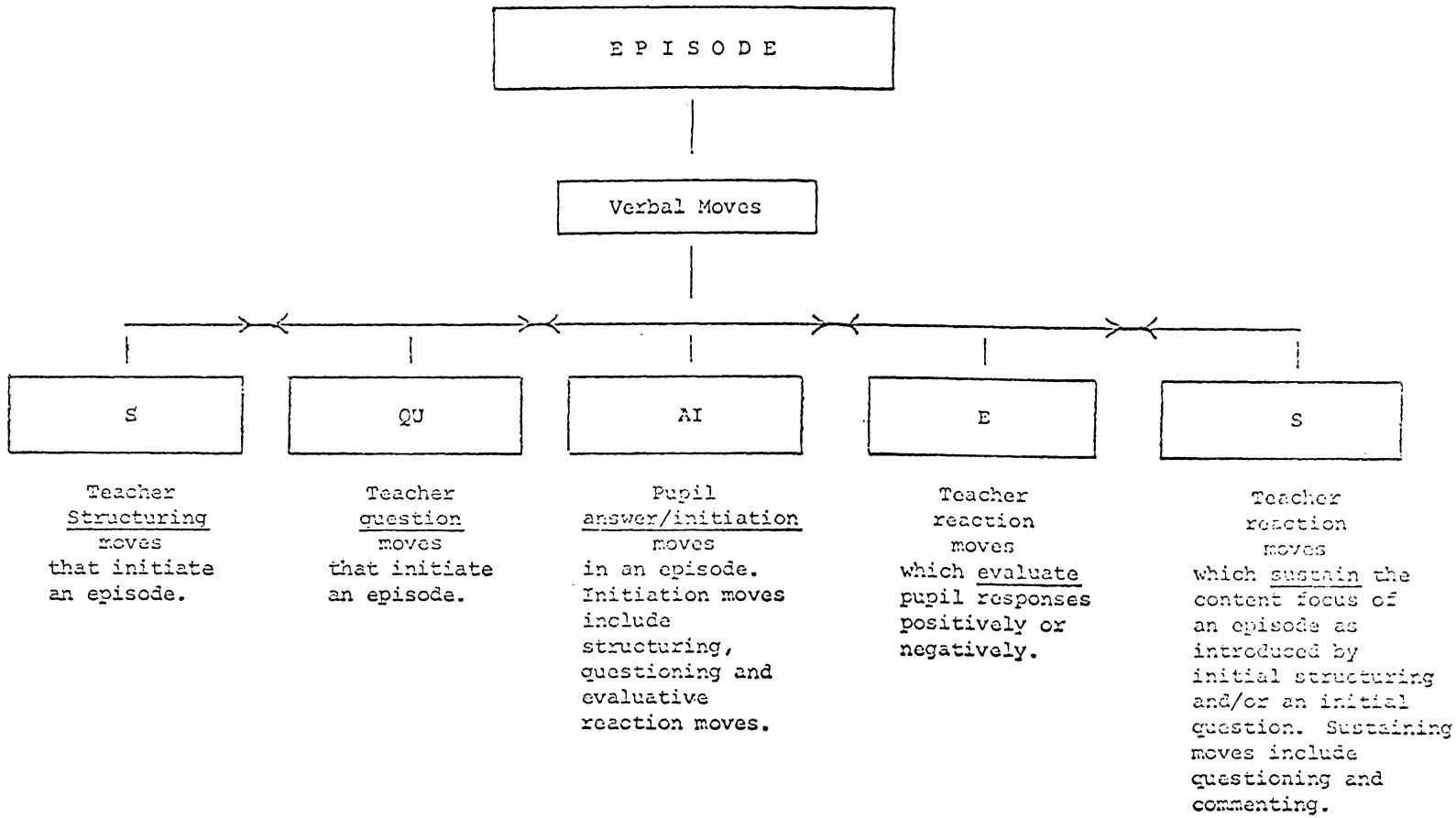


Fig. 7.2 The Empirical Model for the SQUAIES Interaction Analysis Coding System.

TEACHER-LED DISCUSSION MODEL . . . POSSIBLE MOVE DECISIONS IN AN EPISODE

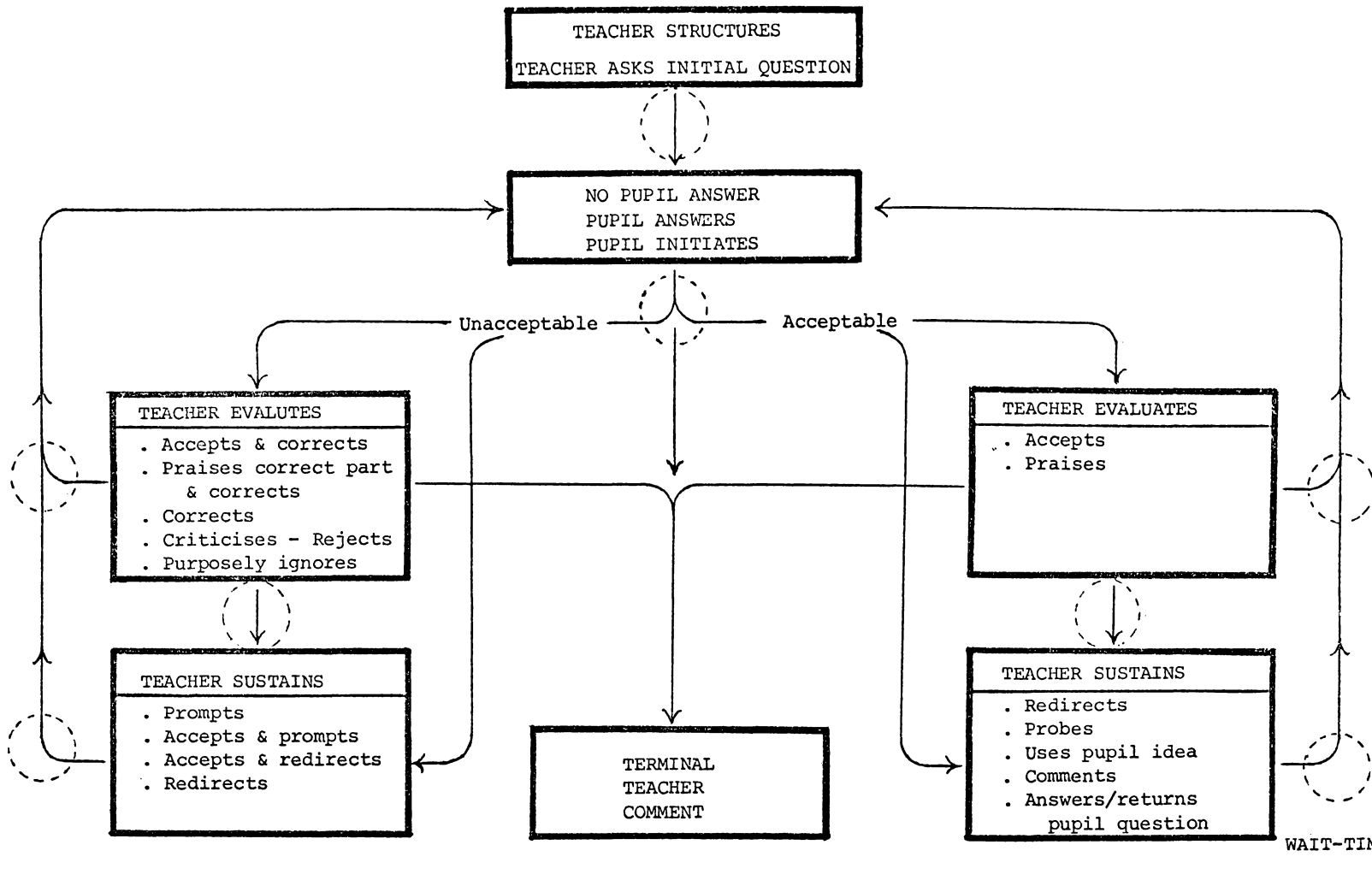


FIG. 7.3 Verbal Move Possibilities within a Discussion Episode

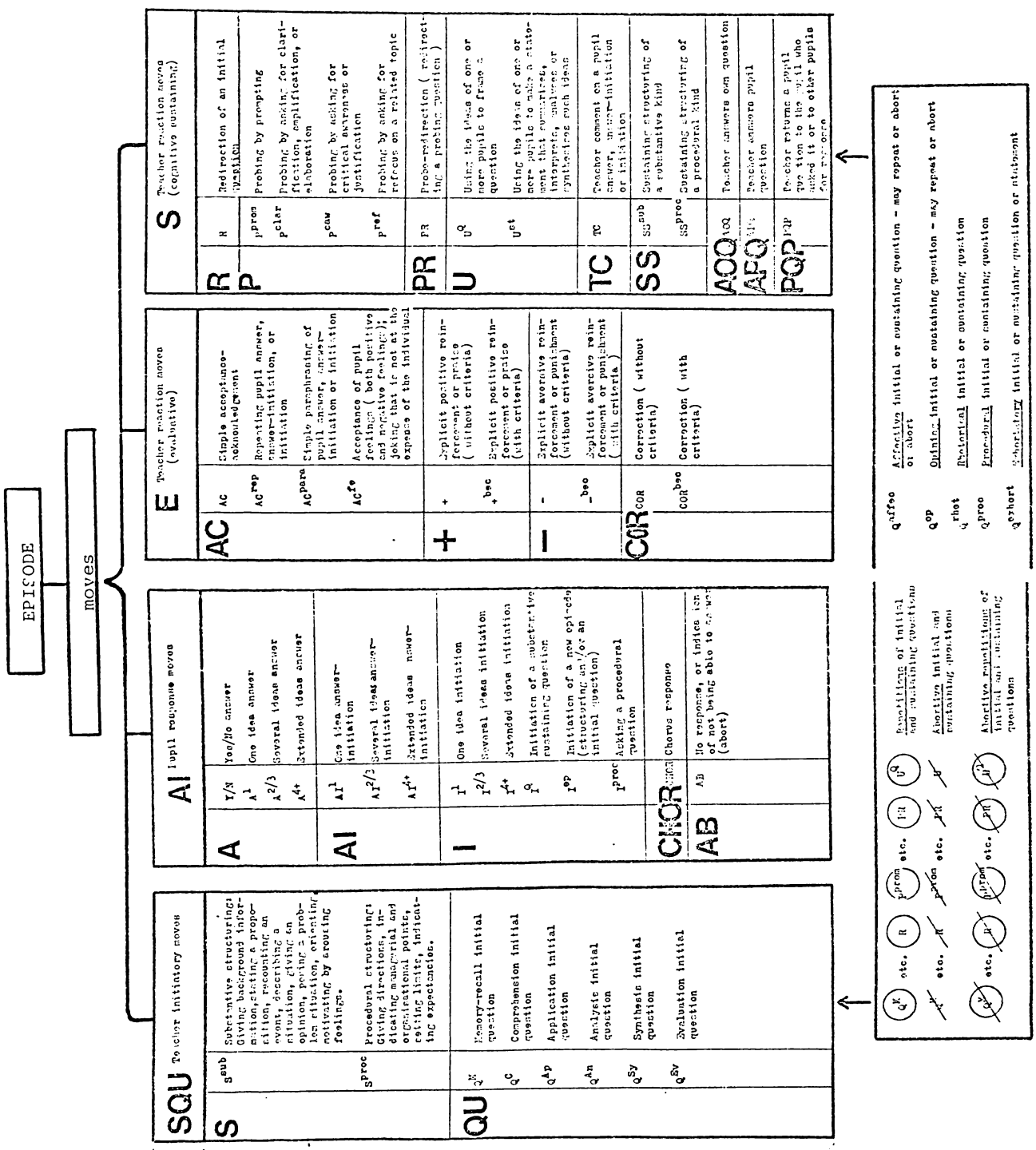


FIG. 7.4 The SQUAIES Interaction Analysis Coding System (Level 2)

TABLE 7.1 Inter-judge Reliability for Marking Off Discussion Episodes in Pre- and Post-test Lesson Transcripts.

	Coding Set	Transcript No.	Agreement Coefficient
Pre-test	1	12	.77
	2	45	.80
	3	51	.68
	4	85	.50
	5	108	.88
	Median		.77
	Range		.50 - .88
Post-test	6	46	.87
	7	8	.59
	8	41	.71
	9	66	.90
	10	50	.90
	Median		.87
	Range		.59 - .90
Combined Pre- and Post test	Median		.79
	Range		.59 - .90

TABLE 7.2 Inter-judge Reliability for Coding Pre- and Post-test Lesson Transcripts
(a) with the complete SQUAIES Coding System, and
(b) with SQUAIES Categories related to Dependent Variables Only.

	Coding Set	Transcript No.	(a) Agreement Coefficients			(b) Agreement Coefficients		
			22 Main Categories	45 Extended Categories	Scott Coeff. 45 Extended Categories	17 Main Categories	35 Extended Categories	Scott Coeff. 45 Extended Categories
Pre-test	1	19	.96	.88	.84	.97	.95	.83
	2	43	.92	.85	.84	.90	.82	.83
	3	69	.92	.85	.80	.91	.84	.80
	4	93	.96	.88	.80	.99	.88	.83
	5	115	.97	.91	.83	.97	.90	.83
	Median		.96	.88	.83	.97	.88	.83
	Range		.92 - .97	.85 - .91	.80 - .84	.90 - .99	.82 - .95	.80 - .83
Post-test	6	31	.92	.89	.84	.91	.87	.80
	7	86	.91	.83	.79	.88	.78	.77
	8	34	.95	.87	.85	.95	.87	.86
	9	48	.93	.84	.82	.94	.86	.82
	10	33	.94	.88	.87	.93	.87	.87
	Median		.93	.87	.84	.93	.87	.82
	Range		.91 - .95	.83 - .89	.79 - .87	.88 - .95	.78 - .87	.77 - .87
Combined pre- and post-test	Median		.93	.88	.84	.93	.87	.83
	Range		.91 - .97	.83 - .91	.79 - .87	.88 - .99	.78 - .95	.77 - .87

TABLE 7.3 Inter-judge Reliability for Coding Pre- and Post-test Lesson Transcripts with SQUAIES (Dependent Variables Considered separately).

Dependent Variable	Pre-test Median Coeffic.	Post-test Median Coeffic.	Combined Pre-test/Post-test Median coeffic.
1. Fluency-control	.90	.91	.91
2. Number of episodes	.77	.87	.79
3. Episode sustaining tendency	.94	.93	.93
4. Redirection tendency	.90	1.00	.98
5. Probing tendency	.94	.87	.91
6. Tendency to use pupil ideas	-	.25*	.25
7. Structuring with questions	.88	.91	.90
8. Low order initial questions	.91	.93	.92
9. Middle order initial questions	.78	.91	.90
10. High order initial questions	1.00	.59	.67
11. High order probing questions	1.00	.80	.90
13. Repeats pupil response	.80	1.00	1.00
14. YES/NO questions	1.00	.95	.95
15. Answers own question	.75	0.00**	.50
16. One ideal pupil responses	.92	.90	.94
17. Several ideas pupil responses	.90	.91	.91
18. Extended ideas pupil responses	.86	.83	.85
19. Coordinate-reactive responding patterns	1.00	.94	.95

*Based on four instances only of this behavioural category.

**Based on one instance only of this behavioural category.

Note: Variable 12, Amount of Teacher Talk, calculated separately.

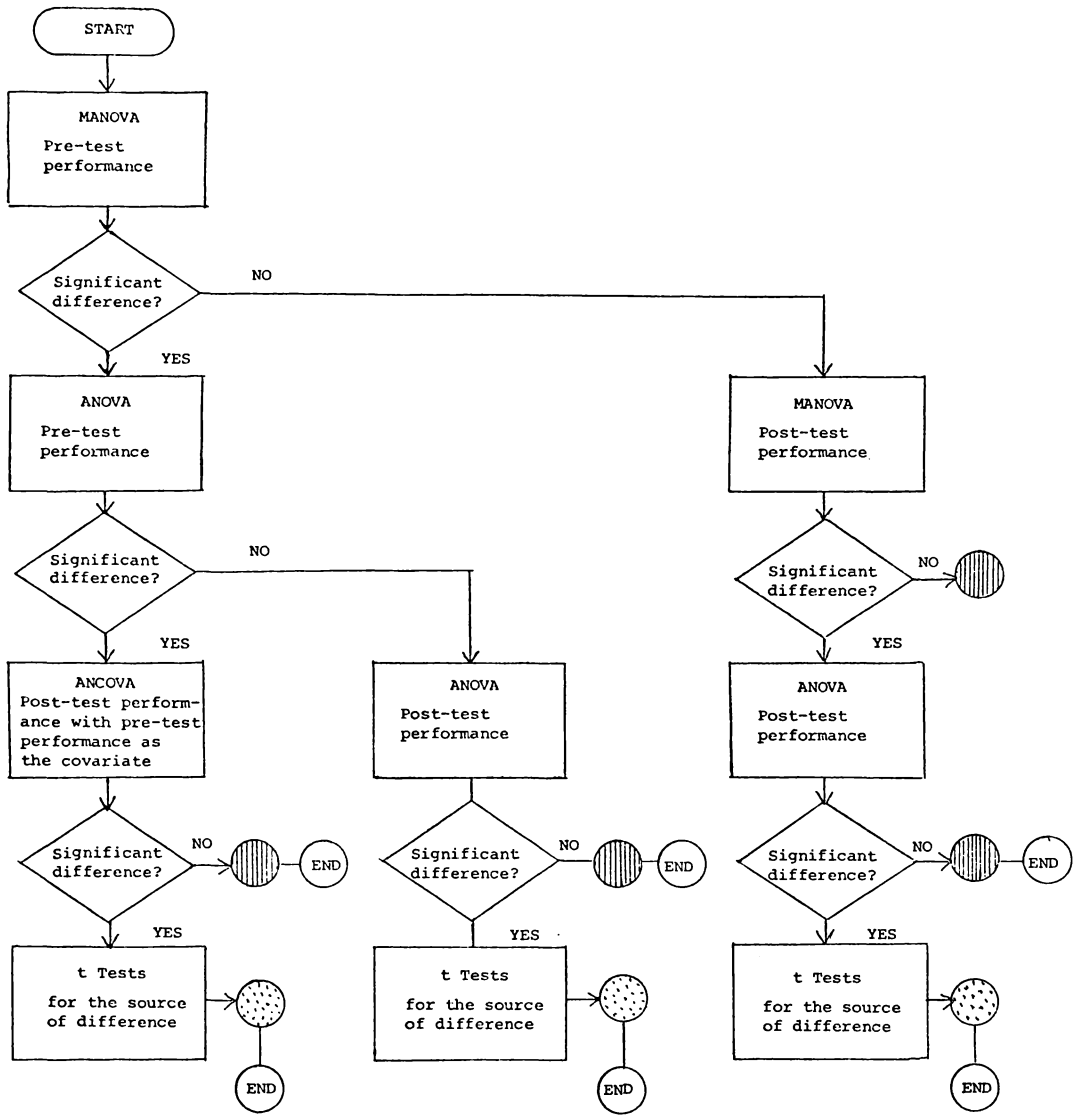


FIG. 7.5 Summary of Statistical Procedures to Test for Differential and Overall Effects of Treatments.

TABLE 8.1 Part 1 Research Design: Multivariate Analysis of Variance on Pre-test Teaching Performance.[1]

Univariate F Ratios with NDF1 = 2 and NDF2 = 93.

Variable	Among Mean Sq.	Within Mean Sq.	F Ratio	Eta Sq.
1	0.00	0.01	0.00	0.00
2	0.00	0.00	0.13	0.00
3	1.73	0.96	1.81	0.04
4	0.00	0.01	0.31	0.01
5	0.03	0.01	2.81	0.06
6	0.00	0.00	1.23	0.03
7	0.01	0.01	1.01	0.02
8	0.00	0.03	0.53	0.01
9	0.00	0.02	0.19	0.00
11	0.00	0.02	0.08	0.00
12	0.00	0.02	0.09	0.00
13	0.02	0.02	1.29	0.03
14	0.01	0.01	1.09	0.02
15	0.00	0.00	0.69	0.01
16	0.07	0.02	3.30	0.07
17	0.02	0.01	2.18	0.04
19	0.01	0.04	0.39	0.01

Wilks Lambda = .66. Generalised correlation ratio, Eta square = .33.

F ratio for H2, test of overall discrimination = 1.01.

With degrees of freedom 34 and 154.

Not significant.

1 Computer programme: Cooley and Lohnes.

TABLE 8.2 Part 1 Research Design: Multivariate Analysis of Variance on Post-test Teaching Performance.[1]

Univariate F ratios, with NDF1 = 2 and NDF2 = 93

Variable	Among Mean Sq.	Within Mean sq.	F Ratio	Eta Sq.
1	0.15	0.01	17.69	0.28
2	0.00	0.00	21.84	0.32
3	12.06	1.99	6.06	0.12
4	0.03	0.02	1.60	0.03
5	0.09	0.02	5.57	0.11
6	0.00	0.00	1.29	0.03
7	0.00	0.01	0.26	0.01
8	0.76	0.38	19.84	0.29
9	0.02	0.03	0.60	0.01
11	0.32	0.04	8.76	0.16
12	0.18	0.02	9.64	0.17
13	0.05	0.01	6.84	0.13
14	0.08	0.01	8.53	0.15
15	0.00	0.00	6.71	0.13
16	0.05	0.02	2.23	0.05
17	0.01	0.01	0.85	0.02
19	0.15	0.03	4.46	0.09

Wilks Lambda = .35. Generalised correlation ratio, Eta square = .65.

F ratio for H2, Test for overall discrimination = 3.08.

With degrees of freedom 34 and 154.

Significant at .01 level.

1 Computer programme: Cooley and Lohnes.

TABLE 8.3 Part 1 Research Design: Summary of Differential and Overall Effects on Teaching Performance of Microteaching (M), Observation-analysis (O), and No-treatment (N).[1,2,3]

Dependent Variables	Differential Treatment Effects						Overall Treatment Effects			
	Post-test ANOVAS			Signif. Level for *Post Hoc* comparisons (Duncan's New Mult. Range test)			Signif. Level for Paired Sample t Tests			
	F	Signif. Level	ω^2	M & O	M & N	N & O	M	O	N	(MON)
CONTROL FUNCTIONS OF TEACHER QUESTIONS:										
1. Fluency-control	17.68	.001	.26	.05 (M)	.01 (M)	.01 (O)	.001	.001	n.s.	
2. Cognitive episode control	21.84	.001	.30	.01 (M)	.01 (M)	.01 (O)	.001	n.s.	n.s.	
3. Episode sustaining tendency	6.06	.003	.10	.05 (M)	.01 (M)	n.s.	.001	n.s.	n.s.	
4. Redirection tendency	1.59	n.s.								n.s.
5. Probing tendency	5.57	.005	.09	.05 (M)	.01 (M)	n.s.	.001	n.s.	n.s.	
6. Use of pupil ideas	1.29	n.s.								n.s.
7. Structuring with questions	0.26	n.s.								.02
MEANING FUNCTIONS OF TEACHER QUESTIONS:										
8. Low order initial questions	19.84	.001	.28	.01 (M)	.01 (M)	.05 (O)	.001	.001	.002	
9. Middle order initial questions	0.59	n.s.								.001
10. High order initial questions	28.87	.001	.38	.01 (M)	.01 (M)	n.s.	.001	.002	n.s.	
11. High order probing	8.76	.001	.16	.01 (M)	.01 (M)	n.s.	.001	.025	n.s.	
TEACHER-PUPIL TALK PATTERNS:										
12. Amount of teacher talk	9.64	.001	.15	.05 (M)	.01 (M)	n.s.	.001	n.s.	n.s.	
13. Repeating pupil responses	6.84	.001	.11	n.s.	.01 (M)	.05 (O)	.001	n.s.	n.s.	
14. Yes/No questions	8.52	.001	.14	.01	.01	n.s.	n.s.	.008	n.s.	
15. Teacher answering own question	6.71	.001	.11	n.s.	.01 (M)	n.s.	.003	n.s.	.04	
16. One ideal pupil responses	2.23	n.s.								.001
17. Several ideas pupil responses	0.85	n.s.								.001
18. Extended ideas pupil responses	2.82	n.s. (.06)								.001
19. Coordinate-reactive pupil responding	4.46	.01	.07	n.s.	.01 (M)	n.s.	.001	.03	n.s.	

1 M (n = 48), O (n = 24), and N (n = 24). Degrees of freedom: (a) for post-test ANOVAS = 2, 93, and (b) for paired sample t tests = 47, 23 and 23 for M, O and N respectively.

2 Bracketed letters M, O or N under significant *post hoc* comparisons indicate the superior treatment in the comparison made.

3 (MON) refers to the use of pre- and post-test means for all treatment groups combined, and was applicable when no significant difference was found between groups in the case of pre- and post-test performance. Complete data on differential and overall effects of treatments are presented in TABLE 8.7.

TABLE 8.4 Part 1 Research Design: Overall Effects on Teaching Performance of Microteaching Treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.69	.84	+ .15	.10	10.03	.001
2. Cognitive episode control	16.54	9.21	-7.33	5.78	8.79	.001
3. Episode sustaining tendency	1.77	2.97	+1.20	1.73	4.78	.001
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.32	.44	+ .12	.16	5.28	.001
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .04	.11	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.69	.20	- .49	.21	15.85	.001
9. Middle order initial questions	.23	.35	+ .12	.21	5.40*	.001
10. High order initial questions	.09	.47	+ .38	.23	11.36	.001
11. High order probing questions	.25	.51	+ .26	.22	8.15	.001
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.52	.35	- .17	.16	7.22	.001
13. Repeating pupil responses	.13	.05	- .08	.12	4.82	.001
14. Yes/No questions	.19	.18	- .01	.12	.62	n.s.
15. Teacher answering own questions	.02	.00	- .02	.03	3.10	.003
16. One idea pupil responses	.56	.47	- .09	.20	4.70*	.001
17. Several ideas pupil responses	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil responses	.09	.14	+ .05	.14	3.50*	.001
19. Coordinate-reactive pupil responding	.33	.50	+ .17	.22	5.30	.001

1 Except for asterisked t scores, probability levels refer to N = 48 and df = 47. Asterisked t scores relate to pre- and post-test means for microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96 and df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.7.

TABLE 8.5 Part 1 Research Design: Overall Effects on Teaching Performance of Observation-analysis Treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.70	.80	+ .10	.14	3.62	.001
2. Cognitive episode control	15.92	13.33	-2.59	6.88	1.84	n.s.
3. Episode sustaining tendency	1.80	2.15	+ .35	1.35	1.27	n.s.
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.33	.36	+ .03	.16	1.04	n.s.
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .04	.11	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.69	.38	- .31	.23	6.67	.001
9. Middle order initial questions	.23	.35	+ .12	.21	5.40*	.001
10. High order initial questions	.08	.25	+ .17	.24	3.45	.002
11. High order probing questions	.27	.36	+ .09	.20	2.39	.025
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.51	.45	- .06	.19	1.66	n.s.
13. Repeating pupil responses	.10	.08	- .02	.11	.97	n.s.
14. Yes/No questions	.17	.24	+ .07	.12	2.88	.008
15. Teacher answering own questions	.01	.02	+ .01	.04	.79	n.s.
16. One ideal pupil responses	.56	.46	- .09	.20	4.70*	.001
17. Several ideas pupil responses	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil responses	.09	.14	+ .05	.14	3.50*	.001
19. Coordinate-reactive pupil responding	.32	.42	+ .10	.22	2.33	.029

1 Except for asterisked t scores, probability levels refer to N = 24 and df = 23. Asterisked t scores relate to pre- and post-test means for microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96 and df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.7.

TABLE 8.6 Part 1 Research Design: Overall Effects on Teaching Performance of No-treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.69	.70	+ .01	.12	.43	n.s.
2. Cognitive episode control	16.54	16.50	- .04	7.00	.03	n.s.
3. Episode sustaining tendency	2.22	1.83	- .39	.98	1.93	n.s.
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.39	.35	- .04	.12	1.68	n.s.
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .04	.11	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.65	.49	- .16	.23	3.40	.002
9. Middle order initial questions	.23	.35	+ .12	.21	5.40*	.001
10. High order initial questions	.11	.15	+ .04	.22	.94	n.s.
11. High order probing questions	.26	.34	+ .08	.23	1.78	n.s.
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.51	.49	- .02	.17	.51	n.s.
13. Repeating pupil responses	.17	.13	- .04	.16	1.18	n.s.
14. Yes/No questions	.22	.26	+ .04	.16	1.42	n.s.
15. Teacher answering own questions	.01	.03	+ .02	.03	2.11	.046
16. One idea pupil responses	.56	.47	- .09	.20	4.70*	.001
17. Several ideas pupil responses	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil responses	.09	.14	+ .05	.14	3.50*	.001
19. Coordinate-reactive pupil responding	.36	.37	+ .01	.23	.23	n.s.

1 Except for asterisked t scores, probability levels refer to N = 24 and df = 23. Asterisked t scores relate to pre- and post-test means for microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96 and df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.7.

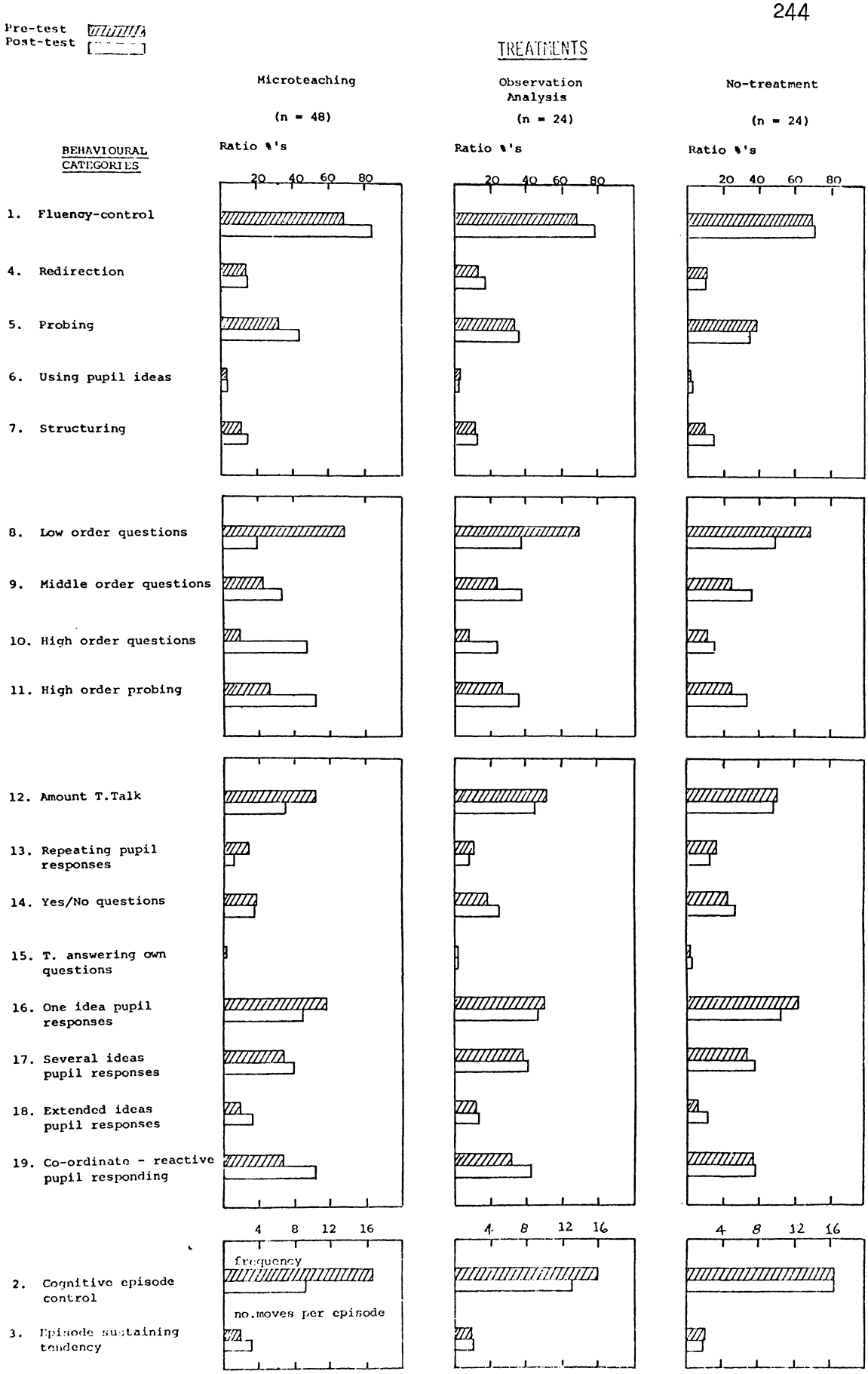


FIG. 8.1 Part 1 Research Design: Overall Effects on Teaching Performance of Microteaching (M), Observation-analysis (O), and No-treatment (N).

TABLE 8.7

Part 1 Research Design: Differential and Overall Effects on Each Dependent Variable of Microteaching (M), Observation-analysis (O), and No-treatment (N).

1. Fluency - control

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.3042	2	.1521	17.68	.001	.26
Within groups	.7999	93	.0086			
Totals	1.1041	95				

Bartlett's Test

M/C = 2.650 df = 2 P = .265

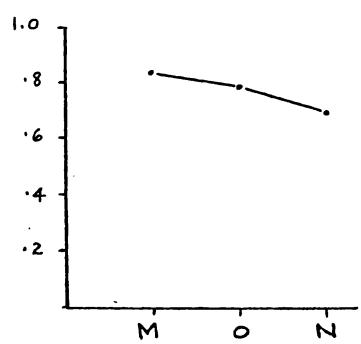
Homogeneity of variance accepted.

Treatment Group Means

		s.d.
M =	.8427	.08
O =	.7960	.09
N =	.7048	.10

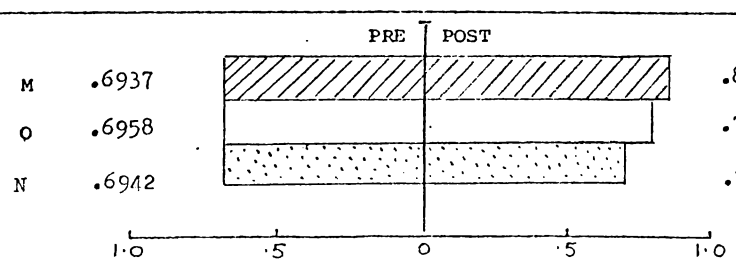
Duncan's New Multiple Range Test

	M	O	N
P = .05			
P = .01	———		



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.6937	.8427	.1490	.103	10.03	.001
O (24)	.6958	.7960	.1002	.136	3.62	.001
N (24)	.6942	.7048	.0106	.121	.43	n.s.



2. Cognitive Episode Control

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	902.3750	2	451.1875	21.84	.001	.30
Within groups	1921.2500	93	20.6586			
Totals	2823.6250	95				

Bartlett's Test

M/C = 9.904 df = 2 P = .007

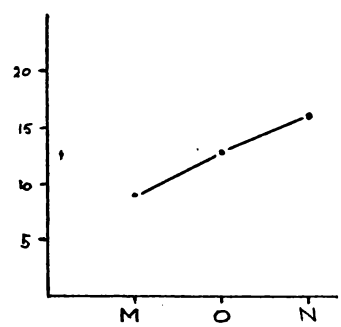
Homogeneity of variance not accepted.

Treatment Group Means		s.d.
M =	9.208	3.41
O =	13.333	5.51
N =	16.500	5.42

Duncan's New Multiple Range Test

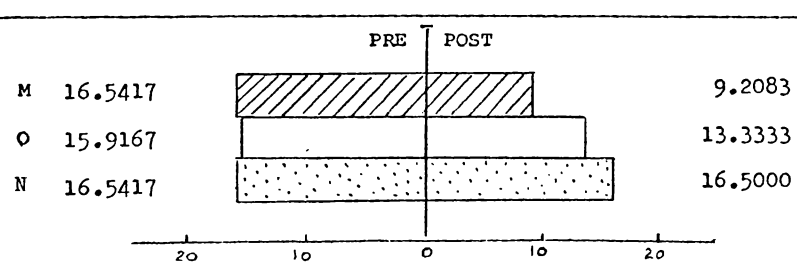
	M	O	N
.05			
.01			

(all different)



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	16.5417	9.2083	7.3333	5.777	8.79	.001
O (24)	15.9167	13.3333	2.5833	6.884	1.84	n.s.
N (24)	16.5417	16.5000	.0417	7.000	.03	n.s.



3. Episode Sustaining Tendency

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	24.1288	2	12.0644	6.06	.003	.10
Within groups	185.0639	93	1.9899			
Totals	209.1927	95				

Bartlett's Test

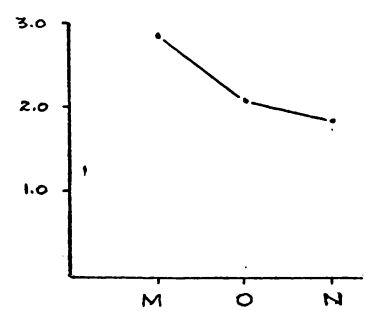
M/C = 17.555 df = 2 P = 0.00015

Homogeneity of variance not accepted.

Treatment Group Means		s.d.
M =	2.9655	1.62
O =	2.1468	1.48
N =	1.8297	.68

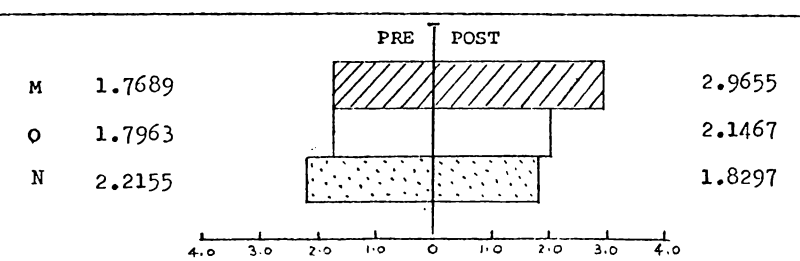
Duncan's New Multiple Range Test

	M	O	N
P = .05		———	
P = .01	———	———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	1.7689	2.9655	1.1966	1.734	4.78	.001
O (24)	1.7963	2.1467	.3505	1.349	1.27	n.s.
N (24)	2.2155	1.8297	.3858	.977	1.93	n.s.



4. Redirection Tendency

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.05247	2	.0262	1.59	.207	-
Within groups	1.52679	93	.0164			
Totals	1.57926	95				

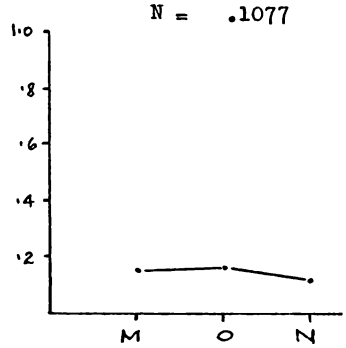
Bartlett's Test

M/C = 10.744 df = 2 P = .004

Homogeneity of variance not accepted.

Treatment Group Means

		s.d.
M =	.1494	.11
O =	.1725	.17
N =	.1077	.09

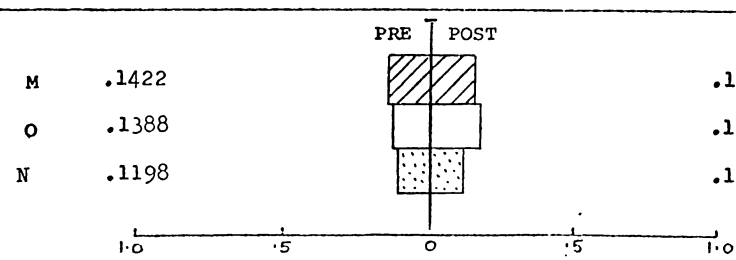


Duncan's New Multiple Range Test

	M	O	N
P = .05			

(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.136	.145	.009	.161	.53	n.s.



5. Probing Tendency

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.1867	2	.0933	5.57	.005	.09
Within groups	1.5592	93	.0168			
Totals	1.7459	95				

Bartlett's Test

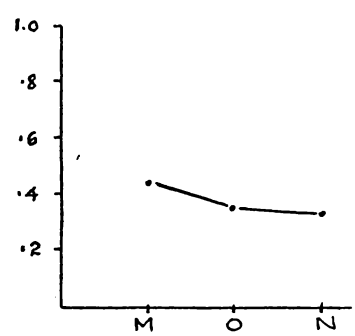
M/C = 1.029 df = 2 P = .5979

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.4443	.13
O =	.3646	.13
N =	.3490	.11

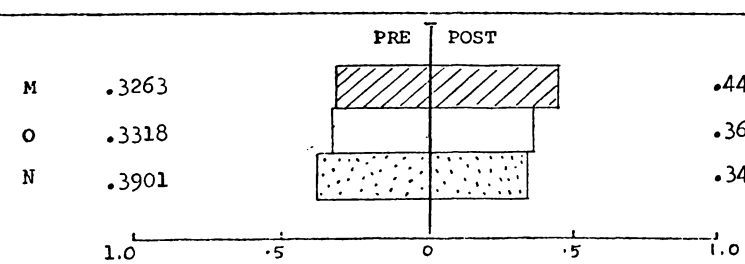
Duncan's New Multiple Range Test

	M	O	N
P = .05		———	
P = .01	———	———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.3263	.4443	.1180	.155	5.28	.001
O (24)	.3318	.3646	.0328	.155	1.04	n.s.
N (24)	.3901	.3490	.0411	.120	1.68	n.s.



6. Use of Pupil Ideas

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0025	2	.0012	1.29	.279	-
Within groups	.0927	93	.0009			
Totals	.0952					

Bartlett's Test

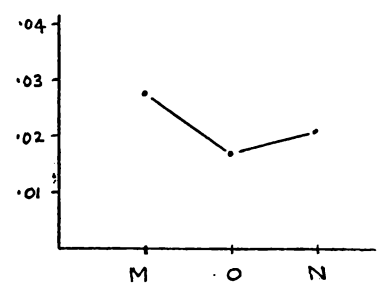
M/C = 1.303 df = 2 P = .521

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.0289	.03
O =	.0168	.02
N =	.0212	.03

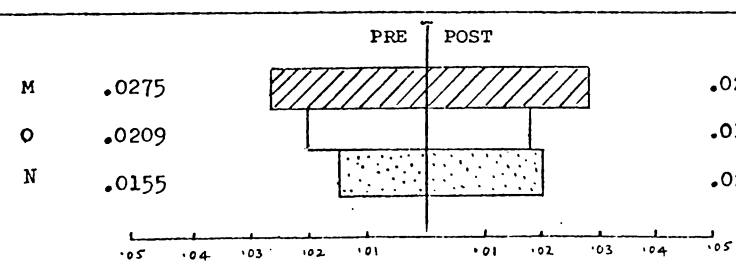
Duncan's New Multiple Range Test

	M	O	N
P = .05			



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.0228	.0239	.0011	.032	.33	n.s.



7. Structuring with Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.00378	2	.0019	.26	.773	-
Within groups	.68128	93	.0073			
Totals	.68506	95				

Bartlett's Test

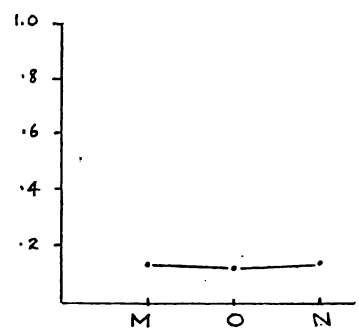
M/C = 2.938 df = 2 P = .2302

Homogeneity of variance accepted.

Treatment Group Means		s.d
M =	.1444	.09
O =	.1298	.07
N =	.1442	.07

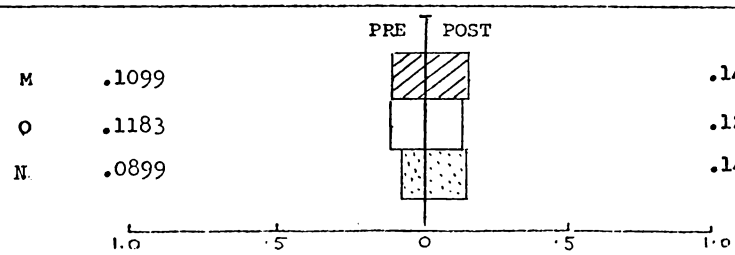
Duncan's New Multiple Range Test

P = .05	M	O	N
	———	———	———



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.1051	.1406	.0355	.105	2.45	.02



8. Asking Low Order Initial Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	1.5111	2	.7557	19.84	.001	.28
Within groups	3.5418	93	.0381			
Totals	5.0529					

Bartlett's Test

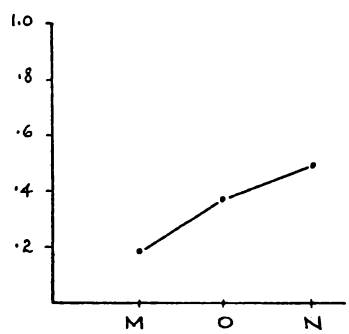
M/C = .404 df = 2 P = .817

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.1974	.19
O =	.3788	.20
N =	.4918	.18

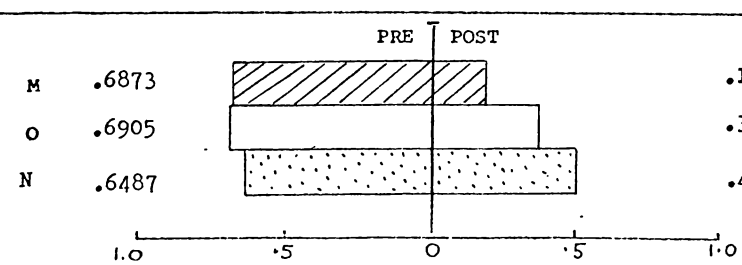
Duncan's New Multiple Range Test

	M	O	N
P = .05			
P = .01		———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.6873	.1974	.4898	.214	15.85	.001
O (24)	.6905	.3788	.3116	.229	6.67	.001
N (24)	.6487	.4918	.1569	.226	3.40	.002



9. Asking Middle Order Initial Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0380	2	.0190	.59	.551	-
Within groups	2.9544	93	.0317			
Totals	2.9924	95				

Bartlett's Test

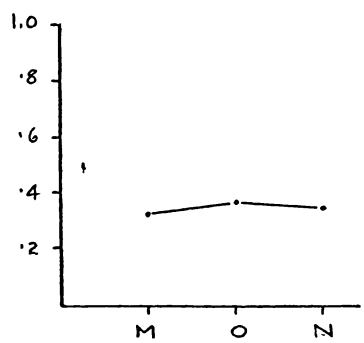
M/C = .833 df = 2 P = .659

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.3276	.17
O =	.3753	.19
N =	.3530	.16

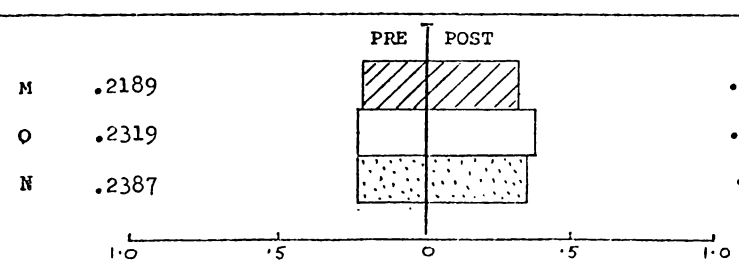
Duncan's New Multiple Range Test

	M	O	N
P = .05	———		



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.2271	.3458	.1187	.212	5.40	.001



10. Asking High Order Initial Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	1.9051	2	.9525	28.87	.001	.38
Within groups	3.0685	93	.0329			
Totals	4.9736					

Bartlett's Test

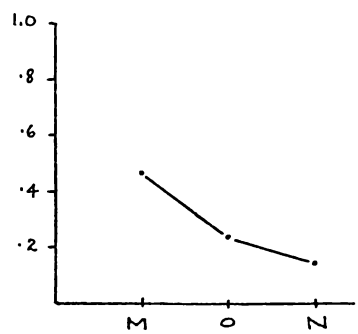
M/C = 4.766 df = 2 P = .092

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.4750	.19
O =	.2459	.19
N =	.1553	.13

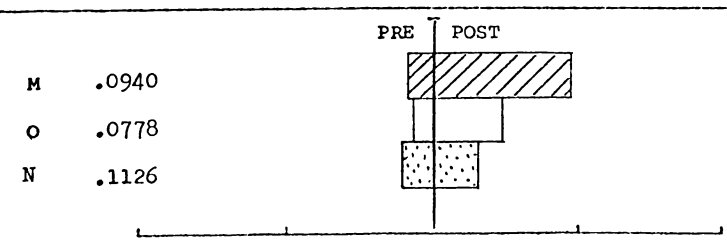
Duncan's New Multiple Range Test

	M	O	N
P = .05		———	
P = .01		———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.0940	.4750	. 3810	.232	11.36	.001
O (24)	.0778	.2459	. 1680	.239	3.45	.002
N (24)	.1126	.1553	. 0428	.222	0.94	n.s.



11. Asking High Order Probing Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.6309	2	.3154	8.76	.001	.16
Within groups	3.3490	93	.0360			
Totals	3.9799	95				

Bartlett's Test

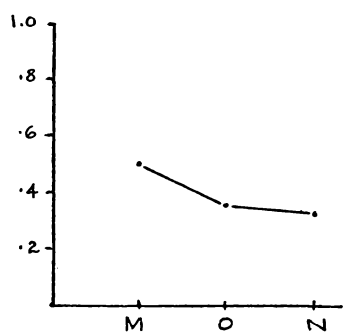
M/C = 5.603 df = 2 P = .0607

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.5122	.21
O =	.3621	.14
N =	.3396	.16

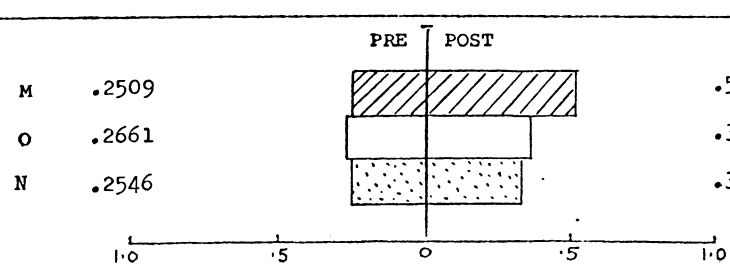
Duncan's New Multiple Range Test

	M	O	N
P = .05		———	
P = .01		———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.2509	.5122	.2613	.222	8.15	.001
O (24)	.2661	.3621	.0960	.197	2.39	.025
N (24	.2546	.3396	.0850	.234	1.78	n.s.



12. Amount of Teacher Talk

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.3514	2	.1757	9.64	.001	.15
Within groups	1.6946	93	.0182			
Totals	2.0460	95				

Bartlett's Test

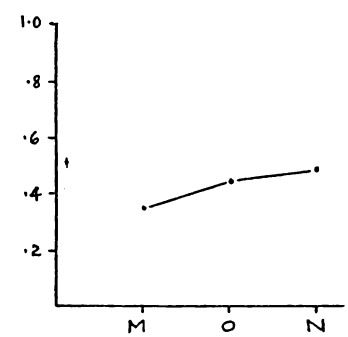
M/C = .983 df = 2 P = .611

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.3502	.12
O =	.4479	.15
N =	.4878	.13

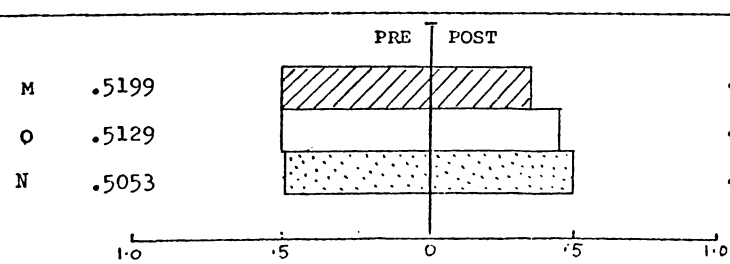
Duncan's New Multiple Range Test

	M	O	N
P = .05		———	
P = .01	———		———



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.5199	.3502	.1697	.163	7.22	.001
O (24)	.5129	.4479	.0650	.191	1.66	n.s.
N (24)	.5053	.4878	.0175	.168	.51	n.s.



13. Teacher Repetition of Pupil Responses

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0983	2	.0491	6.84	.001	.11
Within groups	.6682	93	.0071			
Totals	.7665					

Bartlett's Test

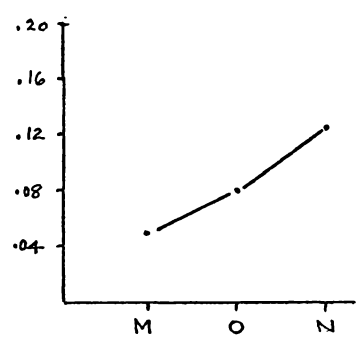
M/C = 12.418 df = 2 P = .002

Homogeneity of variance not accepted.

Treatment Group Means		s.d.
M =	.0499	.06
O =	.0847	.08
N =	.1277	.11

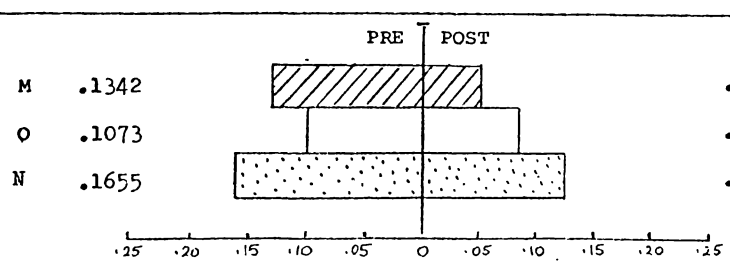
Duncan's New Multiple Range Test

	M	O	N
P = .05	———		
P = .01	———	———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.1342	.0500	.0842	.121	4.82	.001
O (24)	.1073	.0848	.0225	.113	.97	n.s.
N (24)	.1655	.1278	.0377	.157	1.18	n.s.



14. Asking Yes/No Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.151378	2	.0756	8.52	.001	.14
Within groups	.825597	93	.0088			
Totals	.976975	95				

Bartlett's Test

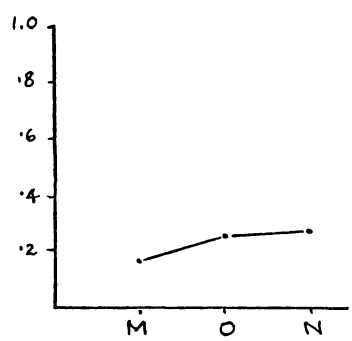
M/C = 1.667 df = 2 P = .434

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.1778	.08
O =	.2499	.09
N =	.2633	.10

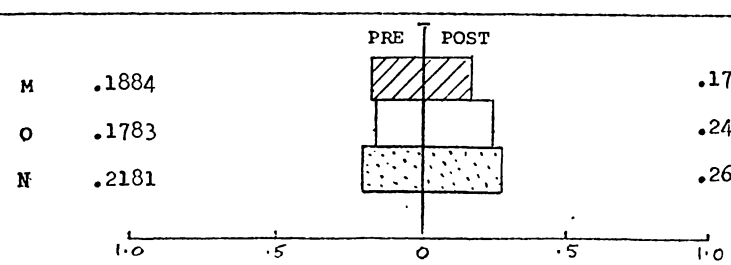
Duncan's New Multiple Range Test

	M	O	N
P = .05		———	
P = .01		———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.1884	.1778	.0106	.119	.62	n.s.
O (24)	.1783	.2499	.0716	.122	2.88	.008
N (24)	.2181	.2633	.0452	.156	1.42	n.s.



15. Teacher Answering His Own Questions

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0089	2	.0044	6.71	.001	.11
Within groups	.0618	93	.0006			
Totals	.0707	95				

Bartlett's Test

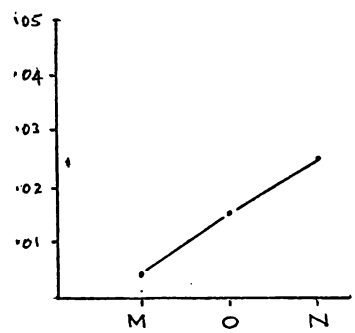
M/C = 74.554 df = 2 P = .000

Homogeneity of variance not accepted.

Treatment Group Means		s.d.
M =	.0031	.00
O =	.0168	.03
N =	.0259	.03

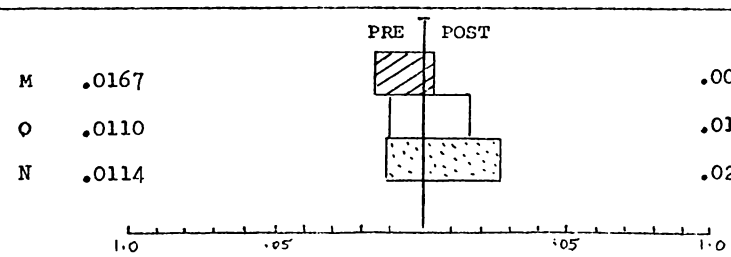
Duncan's New Multiple Range Test

	M	O	N
P = .05	———	———	
P = .01	———	———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.0167	.0031	.0135	.030	3.10	.003
O (24)	.0110	.0168	.0058	.036	.79	n.s.
N (24)	.0114	.0259	.0145	.034	2.11	.046



16. One Idea Pupil Responses

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0908	2	.0454	2.23	.113	-
Within groups	1.8954	93	.0203			
Totals	1.9862	95				

Bartlett's Test

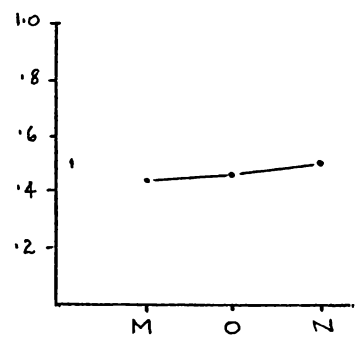
M/C = .886 df = 2 P = .642

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.4426	.14
O =	.4622	.15
N =	.5178	.13

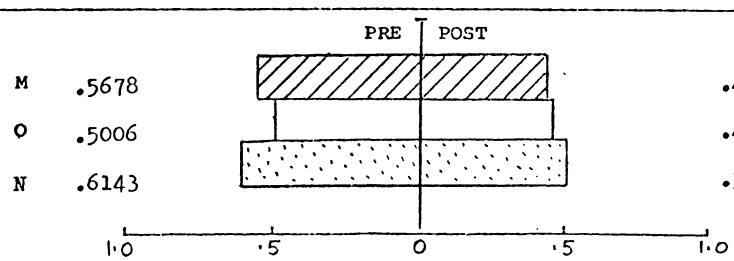
Duncan's New Multiple Range Test

	M	O	N
P = .05	———	———	
P = .01	———	———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.5626	.4663	.0963	.20	4.70	.001



17. Several Ideas Pupil Responses

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0145	2	.0072	.85	.428	-
Within groups	.7922	93	.0085			
Totals	.8067	95				

Bartlett's Test

M/C = .317 df = 2 P = .853

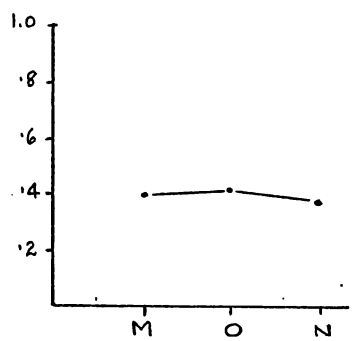
Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.3966	.08
O =	.4096	.09
N =	.3753	.09

Duncan's New Multiple Range Test

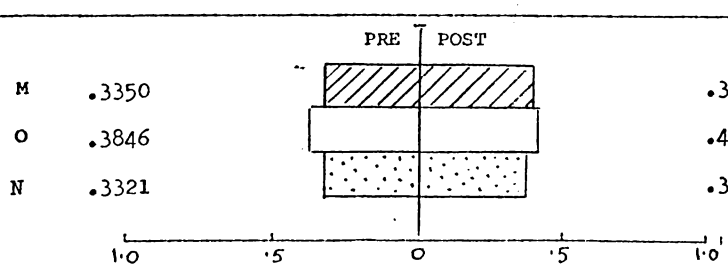
P = .05

M O N



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.3488	.3945	.0457	.122	3.69	.001



18. Extended Ideas Pupil Responses

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.05018	2	.02509	2.82	.06	-
Within groups	.82739	93	.00889			
Totals	.87757	95				

Bartlett's Test

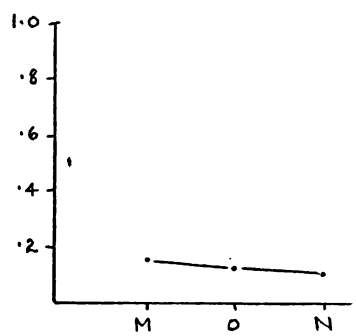
M/C = 5.132 df = 2 P = .076

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.1608	.09
O =	.1282	.10
N =	.1070	.06

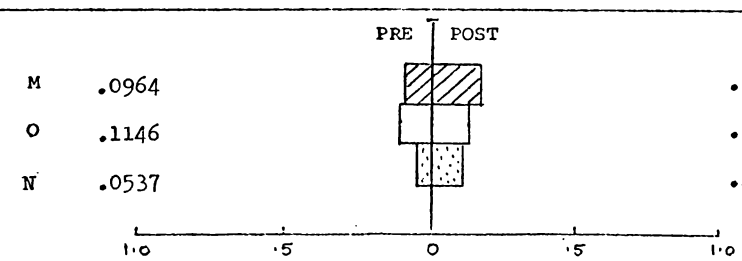
Duncan's New Multiple Range Test

	M	O	N
P = .05	———	———	
P = .01	———	———	



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for M, O and N (96)	.0903	.1392	.0489	.138	3.50	.001



19. Coordinate-reactive Responding Patterns

(a) Difference Between Treatment Groups M O N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.2982	2	.1491	4.46	.01	.07
Within groups	3.1053	93	.0333			
Totals	3.4035	95				

Bartlett's Test

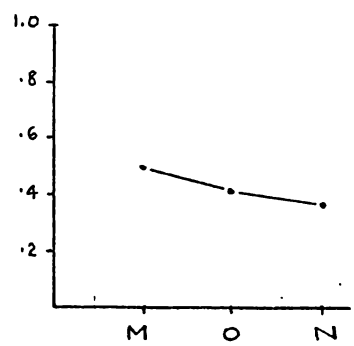
M/C = 3.926 df = 2 P = .1404

Homogeneity of variance accepted.

Treatment Group Means		s.d.
M =	.5052	.20
O =	.4240	.16
N =	.3746	.14

Duncan's New Multiple Range Test

	M	O	N
P = .05			
P = .01			



(b) Change Pretest to Posttest for Treatment Groups M O N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
M (48)	.3336	.5052	.1716	.224	5.30	.001
O (24)	.3166	.4240	.1075	.226	2.33	.029
N (24)	.3640	.3746	.0107	.231	.23	n.s.

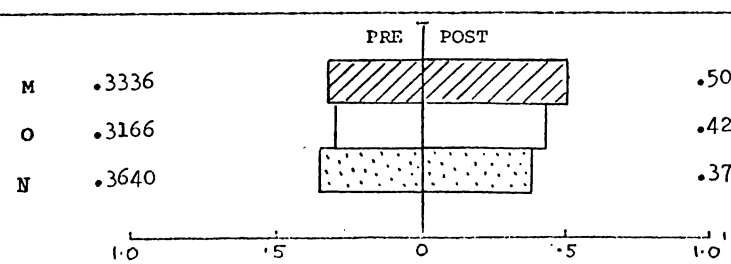


TABLE 8.8 Part 2 Research Design: Multivariate Analysis of Variance on Pre-test Teaching Performance.

Univariate F Ratios, with NDF1 = 4 and NDF2 = 91

Variable	Among Mean Sq.	Within Mean Sq.	F Ratio
1	0.01	0.01	0.56
2	11.13	26.88	0.41
3	0.87	0.98	0.90
4	0.02	0.01	1.25
5	0.04	0.01	2.97
6	0.00	0.00	1.64
7	0.01	0.00	2.45
8	0.01	0.03	0.27
9	0.00	0.02	0.14
11	0.02	0.02	1.13
12	0.01	0.02	0.56
13	0.03	0.02	2.21
14	0.01	0.01	0.70
15	0.00	0.00	3.36
16	0.09	0.02	4.08
17	0.03	0.01	3.10
19	0.02	0.04	0.65

Wilks Lambda = 0.33.

F ratio for H2, overall discrimination = 1.43.

NDF1 = 68 and NDF2 = 296.

Significant at the 0.05 level.

TABLE 8.9 Part 2 Research Design: Summary of ANOVAS on Pre-test Teaching Performance.[1]

Dependent Variables	F Ratio	Signif. Level	Homogeneity of variance (Bartlett's Test)
CONTROL FUNCTION OF TEACHER QUESTIONS:			
1. Fluency-control	.56	.69	Accepted
2. Cognitive episode control	.41	.79	Accepted
3. Episode sustaining tendency	.89	.46	Accepted
4. Redirection tendency	1.25	.29	Not accepted
5. Probing tendency	2.96	.023	Accepted
6. Use of pupil ideas	1.64	.17	Not accepted
7. Structuring with questions	2.45	.05	Accepted
LOGICAL FUNCTION OF TEACHER QUESTIONS:			
8. Low order initial questions	.27	.89	Accepted
9. Middle order initial questions	.14	.96	Accepted
10. High order initial questions	.39	.81	Accepted
11. High order probing questions	1.13	.34	Accepted
TEACHER-PUPIL TALK PATTERNS:			
12. Amount of teacher talk	.56	.69	Accepted
13. Repeating pupil responses	2.21	.07	Accepted
14. Yes/No questions	.69	.59	Accepted
15. Teacher answering own questions	3.36	.01	Not accepted
16. One idea pupil responses	4.08	.004	Accepted
17. Several ideas pupil responses	3.09	.01	Accepted
18. Extended ideas pupil responses	3.29	.014	Not accepted
19. Coordinate-reactive pupil responding	.65	.62	Accepted

N = 96

df = 4, 91

1. Complete data for ANOVAS on pre-test performance may be found in APPENDIX F.

TABLE 8.10 Part 2 Research Design: Summary of Differential and Overall Effects on Teaching Performance of Video and Audio Microteaching (Mv and Ma), Video and Audio Observation-analysis (Ov and Oa) and No-treatment (N).[1,2,3,4]

Dependent Variables	Differential Treatment Effects												Overall Treatment Effects					
	Post-test ANOVAS or ANCOVAS			Signif. Level for *Post Hoc* Comparisons									Signif. Level for Paired Sample t tests					
	F	Sig. Level	ω^2	Mv & Ma	Mv & Ov	Mv & Oa	Mv & N	Ma & Ov	Ma & Oa	Ma & N	Ov & Oa	Ov & N	Oa & N	Mv	Ma	Ov	Oa	N	(Mv, Ma) (Ov, Oa, N)
CONTROL FUNCTIONS OF TEACHER QUESTIONS:																		
1. Fluency-control	9.36	.001	.26	n.s.	n.s.	n.s.	.01 (Mv)	n.s.	.05 (Ma)	.01 (Ma)	n.s.	.01 (Ov)	.01 (Oa)	.001	.001	.04	.02	n.s.	
2. Cognitive episode control	12.17	.001	.32	n.s.	.01 (Mv)	n.s.	.01 (Mv)	.01 (Ma)	n.s.	.01 (Ma)	n.s.	n.s.	.01 (Oa)	.001	.021	n.s.	.007	n.s.	
3. Episode sustaining tendency	3.92	.005	.11	n.s.	.01 (Mv)	n.s.	.01 (Mv)	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	.001	.023	n.s.	n.s.	n.s.	
4. Redirection tendency	1.51	.205 (n.s.)																	n.s.
5. Probing tendency	5.52	.001	.12	n.s.	.01 (Mv)	n.s.	.01 (Mv)	.05 (Ma)	n.s.	n.s.	.05 (Oa)	n.s.	n.s.	.001	.002	n.s.	.048	n.s.	
6. Use of pupil ideas	.71	.58 (n.s.)																	n.s.
7. Structuring with questions	0.36	.83 (n.s.)																	.02
MEANING FUNCTIONS OF TEACHER QUESTIONS:																			
8. Low order initial questions	9.73	.001	.27	n.s.	.05 (Mv)	.05 (Mv)	.01 (Mv)	.05 (Ma)	.05 (Ma)	.01 (Ma)	n.s.	n.s.	n.s.	.001	.001	.003	.001	.002	
9. Middle order initial questions	.36	.83 (n.s.)																	.001
10. High order initial questions	14.28	.001	.36	n.s.	.01 (Mv)	.01 (Mv)	.01 (Mv)	.01 (Ma)	.01 (Ma)	.01 (Ma)	n.s.	n.s.	n.s.	.001	.001	n.s.	.013	n.s.	
11. High order probing	4.54	.002	.13	n.s.	.05 (Mv)	n.s.	.05 (Mv)	.01 (Ma)	n.s.	.01 (Ma)	n.s.	n.s.	n.s.	.001	.001	n.s.	n.s.	n.s.	

Dependent Variables	Differential Treatment Effects												Overall Treatment Effects					
	Post-test ANOVAS or ANCOVAS			Signif. Level for *Post Hoc* Comparisons									Signif. Level for Paired Sample t tests					
	F	Sig. Level	ω^2	Mv & Ma	Mv & Ov	Mv & Oa	Mv & N	Ma & Ov	Ma & Oa	Ma & N	Ov & Oa	Ov & N	Oa & N	Mv	Ma	Ov	Oa	N	(Mv, Ma) (Ov, Ca, N)
TEACHER-PUPIL TALK PATTERNS:																			
12. Amount of teacher talk	5.65	.001	.16	n.s.	.05 (Mv)	n.s.	.01 (Mv)	.01 (Ma)	n.s.	.01 (Ma)	n.s.	n.s.	n.s.	.001	.001	n.s.	n.s.	n.s.	
13. Repeating pupil responses	3.57	.009	.10	n.s.	n.s.	n.s.	.01 (Mv)	n.s.	n.s.	.01 (Ma)	n.s.	n.s.	n.s.	.001	.021	n.s.	n.s.	n.s.	
14. Yes/No questions	4.48	.002	.13	n.s.	.05 (Mv)	n.s.	.05 (Mv)	.01 (Ma)	.05 (Ma)	.01 (Ma)	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	
15. Teacher answering own questions	3.57	.007	.10	n.s.	.05 (Mv)	n.s.	.01 (Mv)	n.s.	n.s.	.05 (Ma)	n.s.	n.s.	n.s.	.004	n.s.	n.s.	n.s.	.046	
16. One idea pupil responses	1.48	.21 (n.s.)																	.001
17. Several ideas pupil responses	0.97	.42 (n.s.)																	.001
18. Extended ideas pupil responses	2.62	.03	.06	n.s.	n.s.	n.s.	n.s.	.05 (Ma)	n.s.	.01 (Ma)	n.s.	n.s.	n.s.	.006	n.s.	n.s.	n.s.	.001	
19. Coordinate-reactive pupil responding	2.81	.029	.07	n.s.	n.s.	n.s.	n.s.	.01 (Ma)	n.s.	.01 (Ma)	n.s.	n.s.	n.s.	.001	.001	n.s.	.01	n.s.	

1 Underlined F ratios and significance levels indicate use of ANCOVA, the result of significant difference being found between treatment groups on pre-test performance.

2 Mv (n = 24), Ma (n = 24), Ov (n = 12), Oa (n = 12), and N (n = 24). Degrees of freedom: (a) for post-test ANOVAS = 4,91; (b) for ANCOVAS = 4,90; and (c) for paired sample t tests = 23,23,11,11 and 23 for Mv, Ma, Ov, Oa and N respectively.

3 (Mv, Ma, Ov, Oa, N) refers to the use of pre- and post-test means for all treatment groups combined, and was applicable when no significant difference was found between groups in the case of pre- and post-test performance, or when ANCOVAS produced a non-significant result. Complete data on differential and overall effects of treatments are included in TABLE 8.15.

4 Bracketed letters Mv, Ma, Ov, Oa or N under significant *post hoc* comparisons indicate the superior treatment in the comparison made.

TABLE 8.11 Part 2 Research Design: Overall Effects on Teaching Performance of Microteaching with Video Treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.67	.82	+ .15	.09	8.06	.001
2. Cognitive episode control	17.38	9.63	-7.75	5.72	6.64	.001
3. Episode sustaining tendency	1.76	3.28	+1.52	1.67	4.42	.001
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.36	.48	+ .12	.15	3.79	.001
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .03	.10	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.69	.19	- .50	.24	9.98	.001
9. Middle order initial questions	.23	.35	+ .12	.21	5.40*	.001
10. High order initial questions	.08	.49	+ .41	.23	8.34	.001
11. High order probing questions	.28	.50	+ .22	.21	5.10	.001
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.55	.37	- .18	.14	5.90	.001
13. Repeating pupil responses	.18	.06	- .12	.13	4.40	.001
14. Yes/No questions	.20	.19	- .01	.15	.33	n.s.
15. Teacher answering own questions	.03	.00	- .03	.03	3.17	.004
16. One idea pupil responses	.56	.46	- .10	.20	4.70*	.001
17. Several ideas pupil responses	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil responses	.07	.14	+ .07	.12	3.03	.006
19. Coordinate-reactive pupil responding	.33	.48	+ .15	.19	3.92	.001

1 Except for asterisked t scores, probability levels refer to N = 24, df = 23. Asterisked t scores relate to pre- and post-test means for all microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96, df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.15.

TABLE 8.12 Part 2 Research Design: Overall Effects on Teaching Performance of Microteaching with Audio Treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.71	.86	+ .15	.11	6.25	.001
2. Cognitive episode control	15.71	8.79	-6.92	5.93	2.48	.021
3. Episode sustaining tendency	1.77	2.65	+ .88	1.76	2.44	.023
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.29	.41	+ .12	.16	3.60	.002
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .03	.10	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.68	.20	- .48	.18	12.96	.001
9. Middle order initial questions	.23	.35	+ .12	.21	5.40*	.001
10. High order initial questions	.10	.46	+ .36	.22	7.64	.001
11. High order probing questions	.22	.52	+ .30	.22	6.46	.001
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.49	.33	- .16	.18	4.42	.001
13. Repeating pupil responses	.09	.04	- .05	.08	2.48	.021
14. Yes/No questions	.18	.17	- .01	.08	.67	n.s.
15. Teacher answering own questions	.01	.01	.00	.01	.96	n.s.
16. One idea pupil responses	.56	.46	- .10	.20	4.70*	.001
17. Several ideas pupil responses	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil responses	.12	.17	+ .05	.16	1.56	n.s.
19. Coordinate-reactive pupil responding	.34	.53	+ .19	.25	3.64	.001

1 Except for asterisked t scores, probability levels refer to N = 24, df = 23. Asterisked t scores relate to pre- and post-test means for all microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96, df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.15.

TABLE 8.13 Part 2 Research Design: Overall Effects on Teaching Performance of Observation-analysis with Video Treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.70	.81	+ .11	.15	2.40	.035
2. Cognitive episode control	16.33	15.08	-1.25	8.84	.49	n.s.
3. Episode sustaining tendency	1.76	1.87	+ .11	1.04	.36	n.s.
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.35	.32	- .03	.13	.87	n.s.
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .03	.10	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.69	.37	- .32	.29	3.73	.003
9. Middle order initial questions	.23	.35	+ .12	.21	5.40*	.001
10. High order initial questions	.09	.24	+ .15	.26	1.92	n.s.
11. High order probing questions	.22	.33	+ .11	.19	1.93	n.s.
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.51	.48	- .03	.20	.52	n.s.
13. Repeating pupil responses	.11	.07	- .04	.12	1.19	n.s.
14. Yes/No questions	.18	.26	+ .08	.13	2.01	n.s.
15. Teacher answering own questions	.01	.02	+ .01	.03	1.19	n.s.
16. One idea pupil response	.56	.46	- .10	.20	4.70*	.001
17. Several ideas pupil response	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil response	.09	.11	+ .02	.12	.45	n.s.
19. Coordinate-reactive pupil responding	.36	.38	+ .02	.20	.29	n.s.

1 Except for asterisked t scores, probability levels refer to N = 12, df = 11. Asterisked t scores relate to pre- and post-test means for all microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96, df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.15.

TABLE 8.14 Part 2 Research Design: Overall Effects on Teaching Performance of Observation-analysis with Audio Treatment.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS						
1. Fluency-control	.70	.79	+ .09	.11	2.73	.02
2. Cognitive episode control	15.50	11.58	-3.92	4.12	3.29	.007
3. Episode sustaining tendency	1.84	2.43	+ .59	1.60	1.27	n.s.
4. Redirection tendency	.14	.15	+ .01	.16	.53*	n.s.
5. Probing tendency	.31	.41	+ .10	.15	2.22	.048
6. Use of pupil ideas	.02	.02	.00	.03	.33*	n.s.
7. Structuring with questions	.10	.14	+ .03	.10	2.45*	.02
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.69	.38	- .31	.15	6.86	.001
9. Middle order initial questions	.23	.35	+ .12	.21	5.40	.001
10. High order initial questions	.06	.25	+ .19	.22	2.97	.013
11. High order probing questions	.31	.39	+ .08	.20	1.40	n.s.
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.51	.41	- .10	.17	1.94	n.s.
13. Repeating pupil responses	.10	.10	.00	.10	.10	n.s.
14. Yes/No questions	.17	.24	- .07	.11	1.99	n.s.
15. Teacher answering own questions	.01	.01	.00	.03	.12	n.s.
16. One idea pupil response	.56	.46	- .10	.20	4.70*	.001
17. Several ideas pupil response	.35	.40	+ .05	.12	3.69*	.001
18. Extended ideas pupil response	.13	.14	+ .01	.18	.21	n.s.
19. Coordinate-reactive pupil responding	.27	.47	+ .20	.22	3.11	.01

1 Except for asterisked t scores, probability levels refer to N = 12, df = 11. Asterisked t scores relate to pre- and post-test means for all microteaching, observation-analysis and no-treatment groups combined, no significant difference being found between these groups in either pre-test or post-test performance. For these t scores, N = 96, df = 95.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.15.

TABLE 8.15

Part 2 Research Design: Differential and Overall Effects on Each Dependent Variable of Video and Audio Microteaching (Mv and Ma), Video and Audio Observation-analysis (Ov and Oa), and No-treatment (N).

1. Fluency - control

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.3218	4	.0804	9.36	.001	.26
Within groups	.7823	91	.0085			
Totals	1.1041	95				

Bartlett's Test

M/C = 5.800 df = 4 P = .214

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

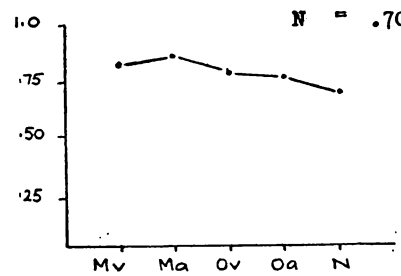
	N	Oa	Ov	Mv	Ma
P = .05					
P = .01					

Treatment Group Means

Mv = .8248 Ov = .8057

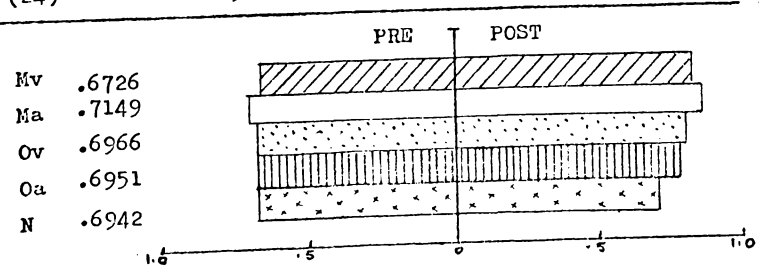
Ma = .8606 Oa = .7863

N = .7048



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.6726	.8248	.1522	.092	8.06	.001
Ma (24)	.7149	.8606	.1457	.114	6.25	.001
Ov (12)	.6966	.8057	.1091	.158	2.40	.035
Oa (12)	.6951	.7863	.0912	.116	2.73	.020
N (24)	.6942	.7048	.0106	.121	.43	n.s.



2. Cognitive Episode Control

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	984.2083	4	246.0520	12.17	.001	.32
Within groups	1839.4167	91	20.2133			
Totals	2823.6250	95				

Bartlett's Test

M/C = 11.949 df = 4 P = .017

Homogeneity of variance not accepted.

Duncan's New Multiple Range Test

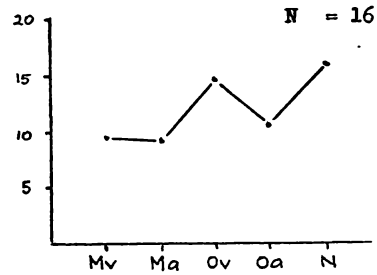
	Ma	Mv	Oa	Ov	N
.05	———	———	———	———	
.01	———	———	———	———	

Treatment Group Means

Mv = 9.625 Ov = 15.083

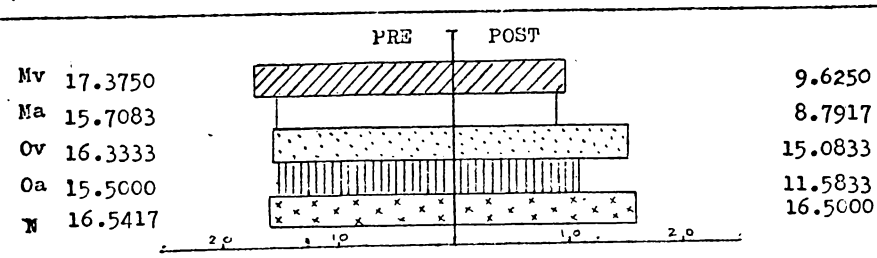
Ma = 8.792 Oa = 11.583

N = 16.500



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	17.3750	9.6250	7.7500	5.720	6.64	.001
Ma (24)	15.7083	8.7917	6.9167	5.926	2.48	.021
Ov (12)	16.3333	15.0833	1.2500	8.843	.49	n.s.
Oa (12)	15.5000	11.5833	3.9167	4.122	3.29	.007
N (24)	16.5417	16.5000	.0417	7.000	.03	n.s.



3. Episode Sustaining Tendency

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	30.8117	4	7.7029	3.92	.005	.11
Within groups	178.3810	91	1.9602			
Totals	209.1927	95				

Bartlett's Test

M/C = 21.783 df = 4 P = .0002

Homogeneity of variance not accepted.

Duncan's New Multiple Range Test

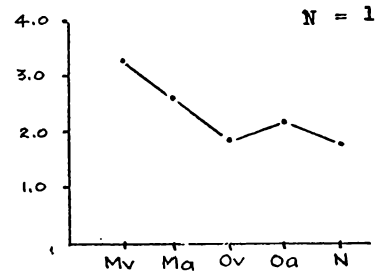
	N	Ov	Oa	Ma	Mv
P = .05					
P = .01					

Treatment Group Means

Mv = 3.2809 Ov = 1.8648

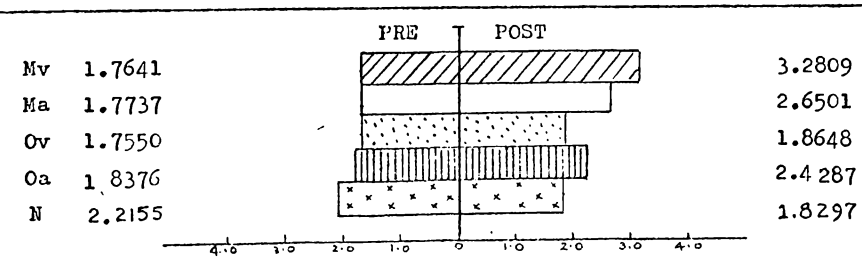
Ma = 2.6501 Oa = 2.4287

N = 1.8297



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	1.7641	3.2809	1.5168	1.679	4.42	.001
Ma (24)	1.7737	2.6501	.8764	1.763	2.44	.023
Ov (12)	1.7550	1.8648	.1098	1.047	.36	n.s.
Oa (12)	1.8376	2.4287	.5911	1.608	1.27	n.s.
N (24)	2.2155	1.8297	.3858	.977	1.93	n.s.



4. Redirection Tendency

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0983	4	.0245	1.51	.205	-
Within groups	1.4809	91	.0162			
Totals	1.5792	95				

Bartlett's Test

M/C = 17.567 df = 4 P = .001

Homogeneity of variance not accepted.

Duncan's New Multiple Range Test

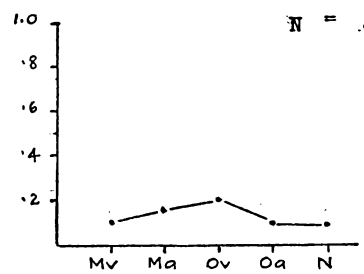
	N	Mv	Oa	Ma	Ov
P = .05					
P = .01					

Treatment Group Means

Mv = .1343 Ov = .2106

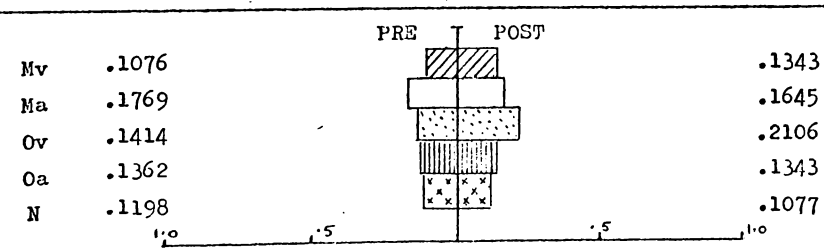
Ma = .1645 Oa = .1343

N = .1077



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for Mv, Ma, Ov, Oa and N (96)	.136	.145	.009	.161	.53	n.s.



5. Probing Tendency

(a) Difference Between Treatment Groups Mv Ma Ov Oa N

Analysis of Covariance- effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	Deviations from Regression SS	df	MS	F	P	w^2
Between groups	.3032	4	.0758	.3329	4	.0832	5.52	.001	.12
Within groups	1.4426	91	.0158	1.3547	90	.0150			
Totals	1.7458	95							

Bartlett's Test

M/C = 1.792 df = 4 P = .77

Homogeneity of variance accepted.

Treatment Group Means (adjusted)

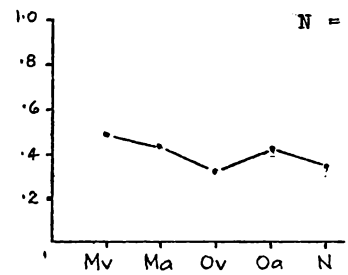
Mv = .4735 Ov = .3139

Ma = .4237 Oa = .4208

N = .3351

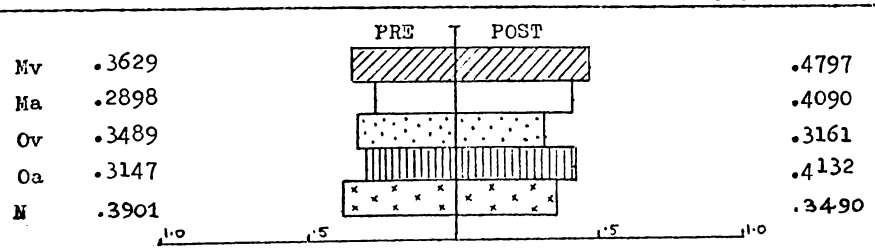
Duncan's New Multiple Range Test

	Ov	N	Oa	Ma	Mv
P = .05					
P = .01					



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.3629	.4797	.1168	.151	3.79	.001
Ma (24)	.2898	.4090	.1192	.162	3.60	.002
Ov (12)	.3489	.3161	.0328	.131	.87	n.s.
Oa (12)	.3147	.4132	.0985	.154	2.22	.048
N (24)	.3901	.3490	.0411	.120	1.68	n.s.



(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0879	1	.0879	5.83	.01
Deviations	1.3547	90	.0150		
Totals	1.4426	91			

The regression accounts for 6.093 % of the SS.

6. Use of Pupil Ideas

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0029	4	.0007	.71	.58	-
Within groups	.0923	91	.0010			
Totals	.0952	95				

Bartlett's Test

M/C = 11.739 df = 4 P = .019

Homogeneity of variance not accepted.

Duncan's New Multiple Range Test

P = .05

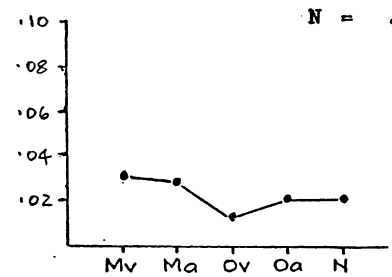
Ov	Oa	N	Ma	Mv

Treatment Group Means

Mv = .0290 Ov = .0131

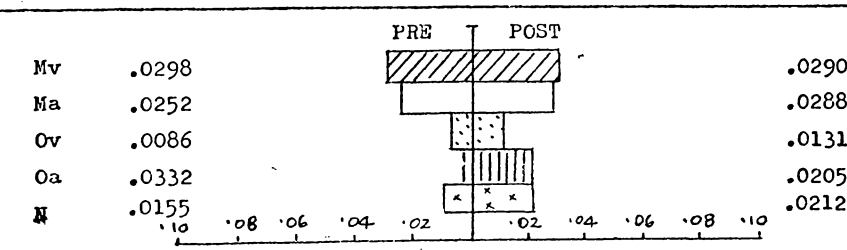
Ma = .0288 Oa = .0205

N = .0212



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for Mv, Ma, Ov, Oa and N (96)	.0288	.0239	.0011	.032	.33	n.s.



7. Structuring with Questions

(a) Difference Between Treatment Groups Mv Ma Ov Oa N

Analysis of Covariance- effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	Deviations from Regression SS	df	MS	F	P	w^2
Between groups	.0128	4	.0032	.0108	4	.0027	.36	.83	-
Within groups	.6721	91	.0073	.6698	90	.0074			
Totals	.6849	95							

Bartlett's Test

M/C = 8.404 df = 4 P = .077

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

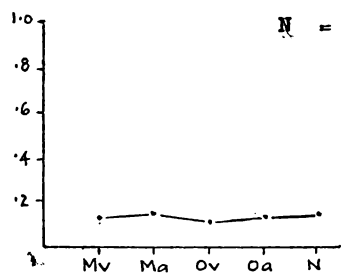
	Ov	Mv	Oa	N	Ma
P = .05	———	———	———	———	———

Treatment Group Means (adjusted)

Mv = .1353 Ov = .1183

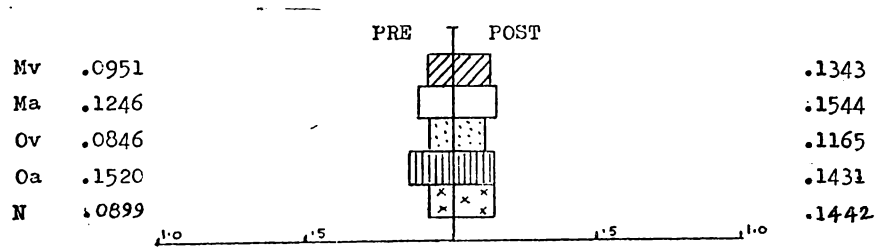
Ma = .1533 Oa = .1340

N = .1456



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for Mv, Ma, Ov, Oa and N (96)	.1051	.1406	.0355	.105	2.45	.02



(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0023	1	.0023	.31	.57
Deviations	.6698	90	.0074		
Totals	.6721	91			

The regression accounts for .351 % of the SS.

8. Asking Low Order Initial Questions

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	1.5142	4	.3785	9.73	.001	.27
Within groups	3.5387	91	.0388			
Totals	5.0529	95				

Bartlett's Test

M/C = 2.075 df = 4 P = .721

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

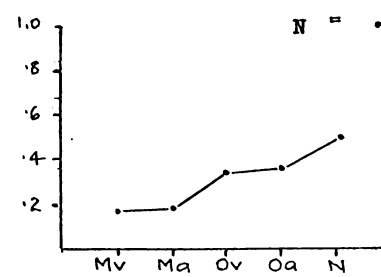
	Mv	Ma	Ov	Oa	N
P = .05	———		———		
P = .01	———		———		

Treatment Group Means

Mv = .1905 Ov = .3731

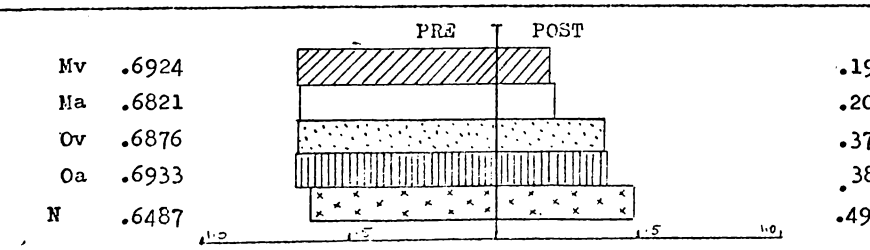
Ma = .2044 Oa = .3846

N = .4918



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.6924	.1905	.5020	.246	9.98	.001
Ma (24)	.6821	.2044	.4777	.181	12.96	.001
Ov (12)	.6876	.3731	.3145	.292	3.73	.003
Oa (12)	.6933	.3846	.3088	.156	6.86	.001
N (24)	.6487	.4918	.1569	.226	3.40	.002



9. Asking Middle Order Initial Questions

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.0466	4	.0116	.36	.83	-
Within groups	2.9924	91	.0323			
Totals	2.9924	95				

Bartlett's Test

M/C = 1.383 df = 4 P = .847

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

P = .05

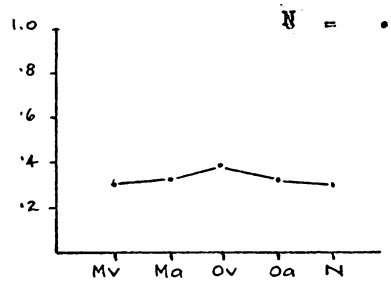
Mv Ma Ov Oa N

Treatment Group Means

Mv = .3192 Ov = .3900

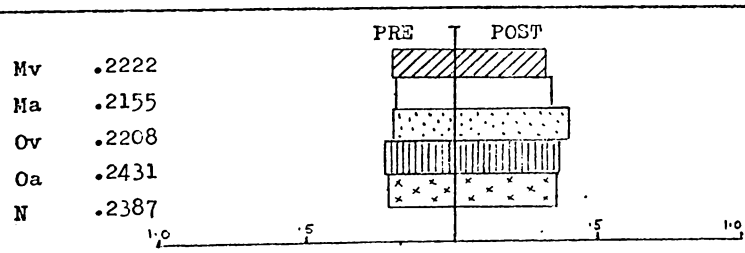
Ma = .3360 Oa = .3607

N = .3530



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for Mv, Ma, Ov, Oa and N (96)	.2271	.3458	.1187	.212	5.40	.001



10. Asking High Order Initial Questions

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	1.9184	4	.4796	14.28	0.001	0.36
Within groups	3.0552	91	.0335			
Totals	4.9736	95				

Bartlett's Test

M/C = 7.028 df = 4 P = .134

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

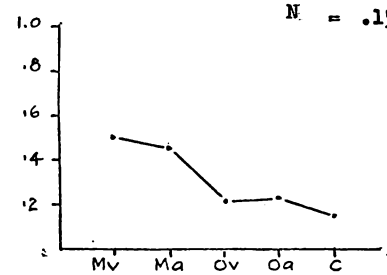
	N	Ov	Oa	Ma	Mv
P = .05	———	———	———	———	———
P = .01	———	———	———	———	———

Treatment Group Means

Mv = .4903 Ov = .2368

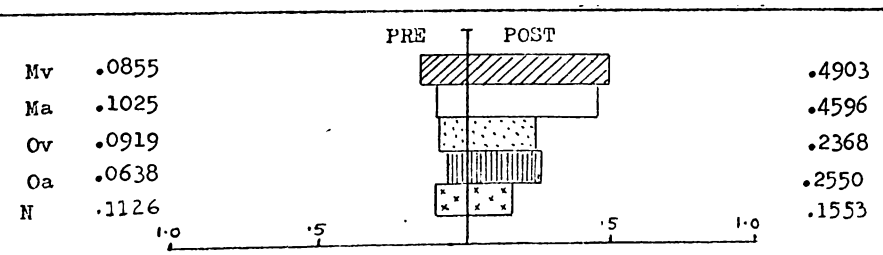
Ma = .4596 Oa = .2550

N = .1553



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.0855	.4903	.4049	.238	8.34	.001
Ma (24)	.1025	.4596	.3572	.229	7.64	.001
Ov (12)	.0919	.2368	.1448	.261	1.92	n.s.
Oa (12)	.0638	.2550	.1913	.223	2.97	.013
N (24)	.1126	.1553	.0428	.222	.94	n.s.



11. Asking High Order Probing Questions

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.66238	4	.16559	4.54	.002	.13
Within groups	3.31758	91	.03645			
Totals	3.97996	95				

Bartlett's Test

M/C = 7.147 df = 4 P = .128

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

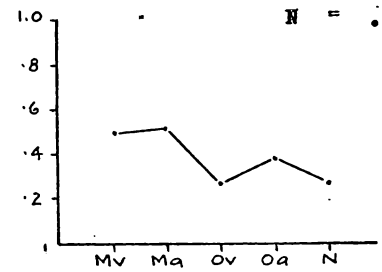
	Ov	N	Oa	Mv	Ma
P = .05	———	———	———	———	
P = .01	———	———	———	———	

Treatment Group Means

Mv = .5019 Ov = .3289

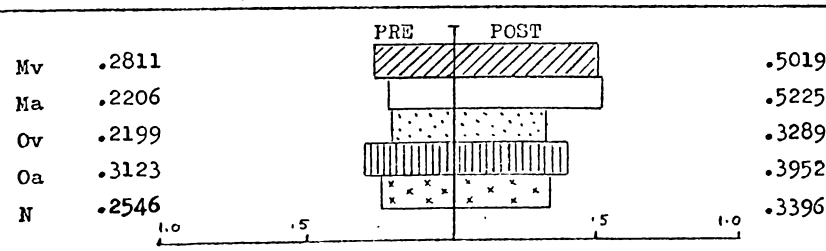
Ma = .5225 Oa = .3953

N = .3396



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.2811	.5019	.2208	.212	5.10	.001
Ma (24)	.2206	.5225	.3018	.229	6.46	.001
Ov (12)	.2199	.3289	.1090	.196	1.93	n.s.
Oa (12)	.3123	.3952	.0830	.205	1.40	n.s.
N (24)	.2546	.3396	.0850	.234	1.78	n.s.



12. Amount of Teacher Talk

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.4072	4	.1018	5.65	.001	.16
Within groups	1.6388	91	.0180			
Totals	2.0460	95				

Bartlett's Test

M/C = 4.191 df = 4 P = .380

Homogeneity of variance accepted.

Treatment Group Means

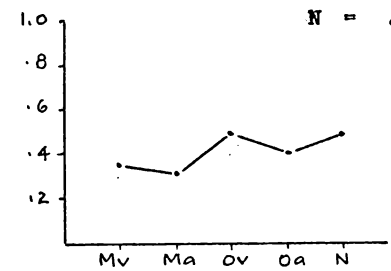
Mv = .3730 Ov = .4838

Ma = .3274 Oa = .4120

N = .4878

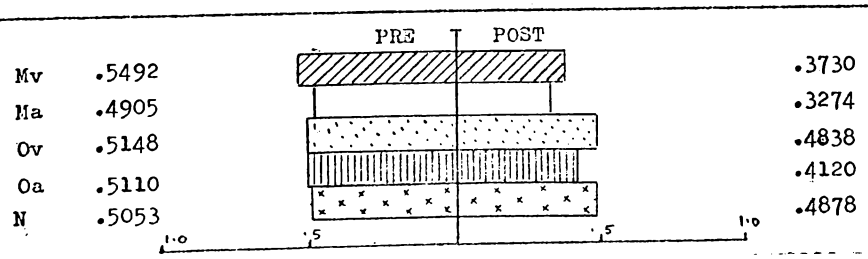
Duncan's New Multiple Range Test

	Ma	Mv	Oa	Ov	N
P = .05	———	———		———	
P = .01	———	———	———	———	



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.5492	.3730	.1763	.146	5.90	.001
Ma (24)	.4905	.3274	.1631	.181	4.42	.001
Ov (12)	.5148	.4838	.0310	.207	.52	n.s.
Oa (12)	.5110	.4120	.0990	.177	1.94	n.s.
N (24)	.5053	.4878	.0175	.168	0.51	n.s.



13. Teacher Repetition of Pupil Responses

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.10405	4	.02601	3.57	.009	.10
Within groups	.66248	91	.00728			
Totals	.76653	95				

Bartlett's Test

M/C = 20.955 df = 4 P = .0003

Homogeneity of variance not accepted.

Duncan's New Multiple Range Test

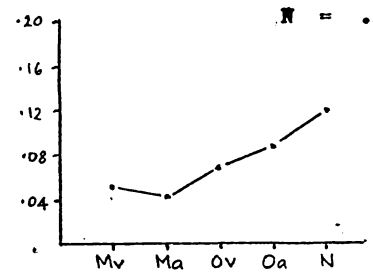
	Ma	Mv	Ov	Oa	N
P = .05					
P = .01					

Treatment Group Means

Mv = .0549 Ov = .0710

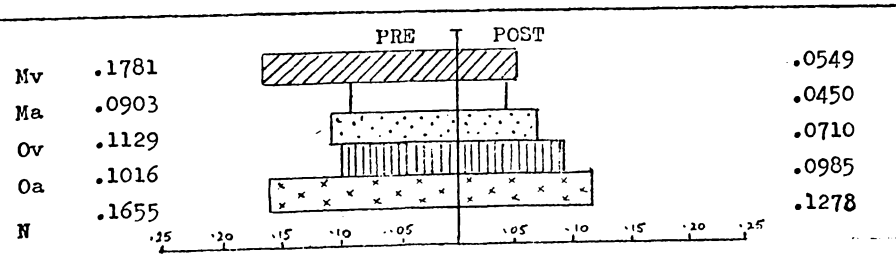
Ma = .0450 Oa = .0985

N = .1278



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.1781	.0549	.1232	.137	4.40	.001
Ma (24)	.0903	.0450	.0452	.089	2.48	.021
Ov (12)	.1129	.0710	.0419	.122	1.19	n.s.
Oa (12)	.1016	.0985	.0031	.105	.10	n.s.
N (24)	.1655	.1278	.0377	.157	1.18	n.s.



14. Asking Yes/No Questions

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.160957	4	.0402	4.48	.002	.13
Within groups	.816018	91	.0089			
Totals	.976975	95				

Bartlett's Test

M/C = 3.402 df = 4 P = .493

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

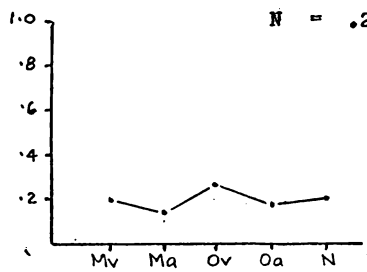
	Ma	Mv	Oa	Ov	N
P = .05	———	———			
		———	———		
			———	———	
P = .01	———	———			
		———	———		
			———	———	

Treatment Group Means

Mv = .1890 Ov = .2620

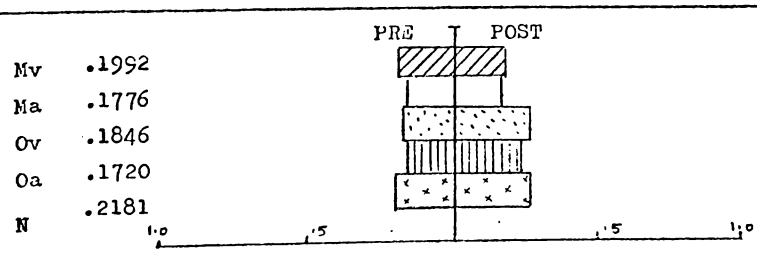
Ma = .1665 Oa = .2378

N = .2633



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.1992	.1890	.0102	.150	.33	n.s.
Ma (24)	.1776	.1665	.0111	.081	.67	n.s.
Ov (12)	.1846	.2620	.0774	.133	2.01	n.s.
Oa (12)	.1720	.2378	.0658	.115	1.99	n.s.
N (24)	.2181	.2633	.0452	.156	1.42	n.s.



15. Teacher Answering His Own Question

(a) Difference Between Treatment Groups Mv Ma Ov Oa N

Analysis of Covariance- effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	Deviations from Regression SS	df	MS	F	P	w^2
Between groups	.0093	4	.0023	.0100	4	.0025	3.75	.007	.10
Within groups	.0614	91	.0006	.0604	90	.0006			
Totals	.0707	95							

Bartlett's Test

M/C = 62.83 df = 4 P = .001

Homogeneity of variance not accepted.

Duncan's New Multiple Range Test

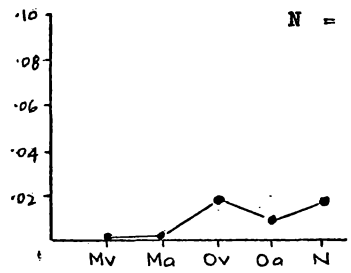
	Mv	Ma	Oa	Ov	N
P = .05					
P .01					

Treatment Group Means (adjusted)

Mv = .0005 Ov = .0218

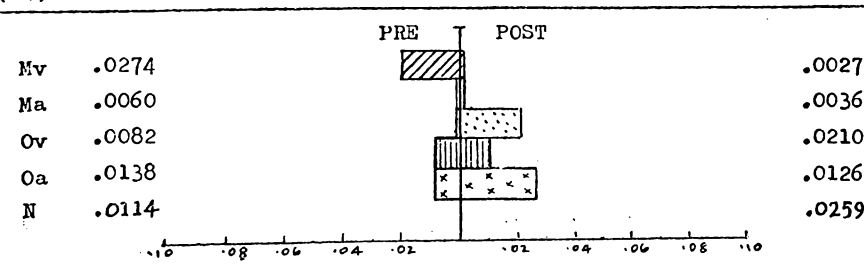
Ma = .0046 Oa = .0125

N = .0262



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.0274	.0027	.0247	.038	3.17	.004
Ma (24)	.0060	.0036	.0024	.012	.96	n.s.
Ov (12)	.0082	.0210	.0128	.037	1.19	n.s.
Oa (12)	.0138	.0126	.0012	.035	.12	n.s.
N (24)	.0114	.0259	.0145	.034	3.10	.046



(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0009	1	.0009	1.48	.22
Deviations	.0604	90	.0006		
Totals	.0613	91			

The regression accounts for 1.619 % of the SS.

16. One Idea Pupil Responses

(a) Difference Between Treatment Groups Mv Ma Ov Oa N.

Analysis of Covariance- effect of treatments on adjusted means (intercepts)

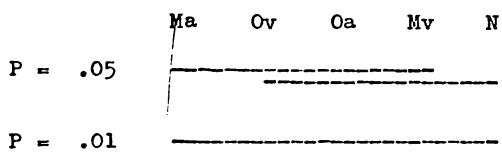
Source of Variation	SS	df	MS	Deviations from Regression SS	df	MS	F	P	w^2
Between groups	.1359	4	.0339	.1221	4	.0305	1.48	.21	-
Within groups	1.8503	91	.0203	1.8480	90	.0205			
Totals	1.9862	95							

Bartlett's Test

M/C = 4.481 df = 4 P = .34

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

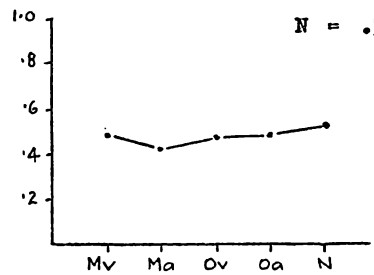


Treatment Group Means (adjusted)

Mv = .4712 Ov = .4637

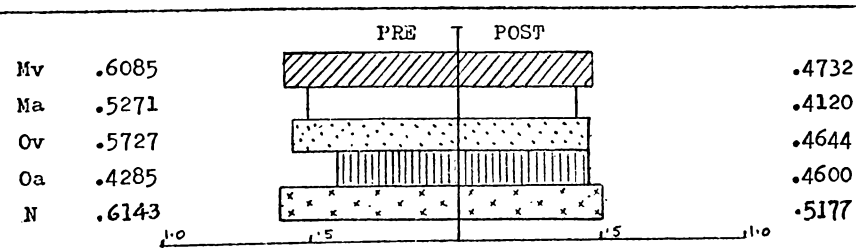
Ma = .4128 Oa = .4641

N = .5156



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for Mv, Ma, Ov, Oa and N (96)	.5626	.4663	.0963	.20	4.70	.001



(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0022	1	.0022	.11	.73
Deviations	1.8480	90			
Totals	1.8502	91			

The regression accounts for .124 % of the SS.

17. Several Ideas Pupil Responses

(a) Difference Between Treatment Groups Mv Ma Ov Oa N

Analysis of Covariance- effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	Deviations from Regression SS	df	MS	F	P	w^2
Between groups	.0318	4	.0079	.0318	4	.0079	.97	.42	-
Within groups	.7748	91	.0085	.7377	90	.0081			
Totals	.8066	95							

Bartlett's Test

M/C = .463 df = 4 P = .97

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

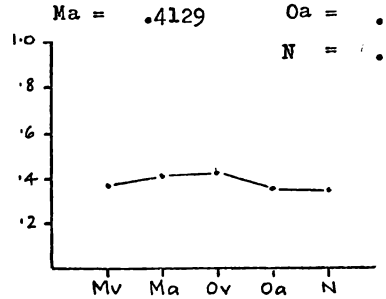
	Oa	N	Mv	Ma	Ov
P = .05	———	———	———	———	

Treatment Group Means (adjusted)

Mv = .3880 Ov = .4293

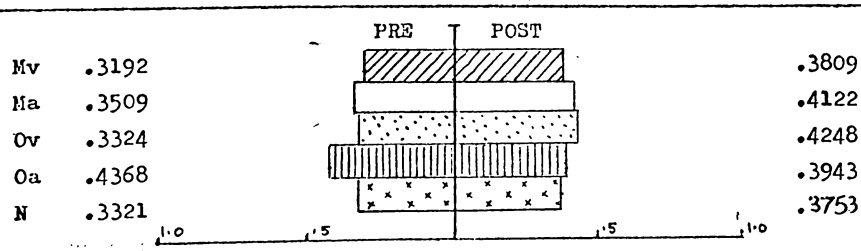
Ma = .4129 Oa = .3777

N = .3797



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Combined mean for Mv, Ma, Ov, Oa and N (96)	.3488	.3945	.0457	.122	3.69	.001



(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0370	1	.0370	4.52	.03
Variations	.7377	90	.0081		
Totals	.7748	91			

The regression accounts for 4.788 % of the SS.

18. Extended Ideas Pupil Responses

(a) Difference Between Treatment Groups Mv Ma Ov Oa N

Analysis of Covariance- effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	Deviations from Regression SS	df	MS	F	P	ω^2
Between groups	.0680	4	.0170	.0904	4	.0226	2.62	.03	.06
Within groups	.8094	91	.0088	.7759	90	.0086			
Totals	.8774	95							

Bartlett's Test

M/C = 8.914 df = 4 P = .06

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

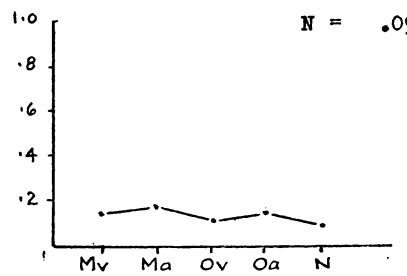
	N	Ov	Mv	Oa	Ma
P = .05	———		———		———
P = .01	———		———		———

Treatment Group Means (adjusted)

Mv = .1403 Ov = .1106

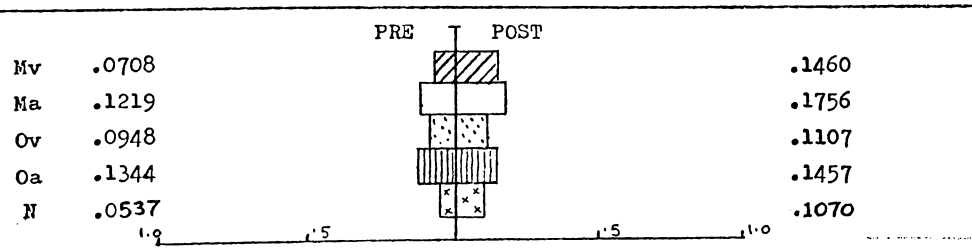
Ma = .1819 Oa = .1549

N = .0973



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.0708	.1460	.0751	.121	3.03	.006
Ma (24)	.1219	.1756	.0537	.169	1.56	n.s.
Ov (24)	.0948	.1107	.0158	.121	.45	n.s.
Oa (24)	.1344	.1457	.0112	.186	.21	n.s.
N (24)	.0537	.1070	.0533	.087	3.00	.006



(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0335	1	.0335	3.89	.05
Variations	.7759	90	.0086		
Totals	.8094	91			

The regression accounts for 4.145 % of the SS.

19. Coordinate-reactive Responding Patterns

(a) Difference Between Treatment Groups Mv Ma Ov Oa N on Posttest Performance

Analysis of Variance

Source of Variation	SS	df	MS	F	P	w^2
Between groups	.3749758	4	.0937	2.81	.029	.07
Within groups	3.0285846	91	.0332			
Totals	3.4035604	95				

Bartlett's Test

M/C = 4.183 df = 4 P = .381

Homogeneity of variance accepted.

Duncan's New Multiple Range Test

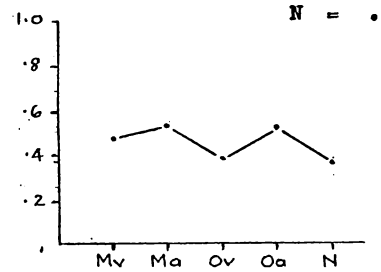
	N	Ov	Oa	Mv	Ma
P = .05					
P = .01					

Treatment Group Means

Mv = .4773 Ov = .3836

Ma = .5331 Oa = .4645

N = .3746



(b) Change Pretest to Posttest for Treatment Groups Mv Ma Ov Oa N

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	SD	T	2-Tail Prob.
Mv (24)	.3245	.4773	.1528	.191	3.92	.001
Ma (24)	.3428	.5331	.1904	.256	3.64	.001
Ov (12)	.3667	.3836	.0169	.201	.29	n.s.
Oa (12)	.2665	.4645	.1980	.221	3.11	.01
N (24)	.3640	.3746	.0107	.231	0.23	n.s.

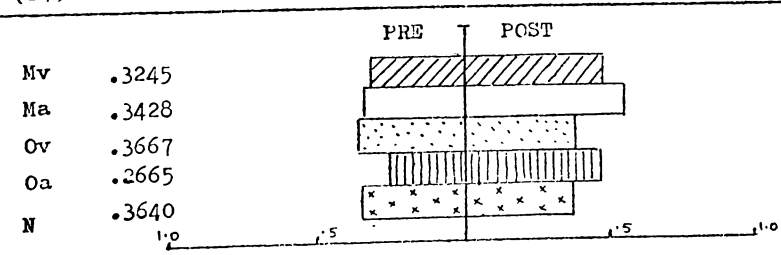


TABLE 8.16 Part 3 Research Design: Multivariate Analysis of Variance[1] on Pre-test Performance.

Source of Variation	Log (generalised variance)	U-statistic	df	Approx. F stat.	df
P (Pupils)	-19.8899	0.6503	18 1 40	0.68	18 23
M (Media)	-19.2838	0.3547	18 1 40	2.32	18 23
Q (Question level)	-19.8097	0.6002	18 1 40	0.85	18 23
P × M	-19.9485	0.6896	18 1 40	0.57	18 23
P × Q	-19.4300	0.4106	18 1 40	1.83	18 23
M × Q	-19.8094	0.6000	18 1 40	0.85	18 23
P × M × Q	-19.5926	0.4831	18 1 40	1.36	18 23
R (P × M × Q)	-20.3201				

Factor M (Media) significant at the 0.05 level.

1 Computer programme: Cooley and Lohnes.

TABLE 8.17 Part 3 Research Design: Summary of Factorial ANOVAS on Pre-test Teaching Performance.[1,2]

Dependent Variables	Factorial ANOVAS													
	P (pupils)		M (media)		Q (qu. level)		P × M		P × Q		M × Q		P × M × Q	
	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level
CONTROL FUNCTIONS OF TEACHER QUESTIONS:														
1. Fluency-control	.35	n.s.	2.41	n.s.	.74	n.s.	.37	n.s.	.35	n.s.	1.06	n.s.	.01	n.s.
2. Cognitive episode control	.20	n.s.	1.27	n.s.	2.68	n.s.	.02	n.s.	2.16	n.s.	.81	n.s.	.38	n.s.
3. Episode sustaining tendency	.27	n.s.	.00	n.s.	2.42	n.s.	.19	n.s.	1.85	n.s.	.20	n.s.	.57	n.s.
4. Redirection tendency	.99	n.s.	4.36	.04	2.14	n.s.	.14	n.s.	.28	n.s.	.09	n.s.	.00	n.s.
5. Probing tendency	.05	n.s.	5.85	.02	.19	n.s.	.24	n.s.	1.38	n.s.	.21	n.s.	.24	n.s.
6. Use of pupil ideas	.01	n.s.	.24	n.s.	.85	n.s.	.21	n.s.	.51	n.s.	4.92	.03	1.69	n.s.
7. Structuring with questions	1.49	n.s.	1.82	n.s.	.00	n.s.	2.05	n.s.	.00	n.s.	1.68	n.s.	.32	n.s.
LOGICAL FUNCTION OF TEACHER QUESTIONS:														
8. Low order initial questions	.17	n.s.	.05	n.s.	1.83	n.s.	1.61	n.s.	.86	n.s.	.23	n.s.	.01	n.s.
9. Middle order initial questions	.86	n.s.	.03	n.s.	5.46	.02	.25	n.s.	2.50	n.s.	.21	n.s.	.59	n.s.
10. High order initial questions	.22	n.s.	.24	n.s.	.65	n.s.	1.15	n.s.	.28	n.s.	.01	n.s.	1.01	n.s.
11. High order probing	.16	n.s.	1.97	n.s.	2.32	n.s.	2.01	n.s.	.07	n.s.	.19	n.s.	3.05	n.s.

TABLE 8.17 (Contd.)

Dependent Variables	Factorial ANOVAS											
	P (pupils)		M (media)		Q (qu. level)		P × M		P × Q		M × Q		P × M × Q	
	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level
TEACHER-PUPIL TALK PATTERNS														
12. Amount of teacher talk	1.02	n.s.	2.25	n.s.	1.46	n.s.	.05	n.s.	2.48	n.s.	2.19	n.s.	.94	n.s.
13. Repeating pupil responses	.00	n.s.	7.45	.009	.02	n.s.	.04	n.s.	.79	n.s.	.43	n.s.	1.67	n.s.
14. Yes/No questions	1.96	n.s.	.58	n.s.	2.76	n.s.	.14	n.s.	1.60	n.s.	.19	n.s.	.32	n.s.
15. Teacher answering own questions	.44	n.s.	8.72	.005	1.56	n.s.	.00	n.s.	4.52	.03	.01	n.s.	4.87	.03
16. One ideal pupil responses	4.16	.04	4.07	.05	3.62	n.s.	.00	n.s.	.04	n.s.	.39	n.s.	.00	n.s.
17. Several ideas pupil responses	1.48	n.s.	1.41	n.s.	.61	n.s.	.22	n.s.	.13	n.s.	.11	n.s.	.52	n.s.
18. Extended ideas pupil responses	5.07	.02	5.00	.03	5.66	.02	.43	n.s.	.77	n.s.	2.46	n.s.	.79	n.s.
19. Coordinate-reactive pupil responding	2.08	n.s.	.10	n.s.	.67	n.s.	.12	n.s.	.16	n.s.	.67	n.s.	.75	n.s.

1 Complete data for factorial ANOVAS on pre-test performance may be found in APPENDIX F.2.

2 N = 48; df = 1 and 40 for each factor, and interaction of factors.

TABLE 8.18 Part 3 Research Design: Summary of Differential and Overall Effects on Teaching Performance of Microteaching Treatments Involving Different Pupils (c = children, p = peers), Media (v = videotape, a = audiotape), Types of Questions Practised (m = middle order, h = high order), and Combinations of these Treatments.[1,2]

Dependent Variables	Differential Treatment Effects								Overall treatment effects	
	Post-test ANOVAS, or ANCOVAS -- Main and interaction effects							Signif. level for *post hoc* comparisons	Signif. level for paired sample t tests	
	P (pupils) F / Signif. Level	M (media) F / Signif. Level	Q(qu.level) F / Signif. Level	P × M F / Signif. Level	P × Q F / Signif. Level	M × Q F / Signif. Level	P × M × Q F / Signif. Level		Sep. gp. Means	Combined gp. Means
CONTROL FUNCTIONS OF TEACHER QUESTIONS:										
1. Fluency-control	2.33 n.s.	2.46 n.s.	.64 n.s.	3.08 n.s.	1.24 n.s.	.59 n.s.	.01 n.s.	-		.001
2. Cognitive episode control	7.43 .009	.77 n.s.	.06 n.s.	.12 n.s.	.62 n.s.	.12 n.s.	1.51 n.s.	-		.001
3. Episode sustaining tendency	1.87 n.s.	1.78 n.s.	.82 n.s.	.06 n.s.	1.63 n.s.	.03 n.s.	.08 n.s.	-		.001
4. Redirection tendency	3.31 n.s.	.55 n.s.	.98 n.s.	3.73 n.s.	.35 n.s.	2.17 n.s.	.22 n.s.	-		n.s.
5. Probing tendency	3.00 n.s.	1.89 n.s.	.07 n.s.	.86 n.s.	2.64 n.s.	.03 n.s.	.01 n.s.	-		.001
6. Use of pupil ideas	1.24 n.s.	.01 n.s.	3.17 n.s.	1.07 n.s.	.91 n.s.	1.80 n.s.	3.31 n.s.	-		n.s.
7. Structuring with questions	1.83 n.s.	.56 n.s.	3.18 n.s.	.88 n.s.	2.33 n.s.	.00 n.s.	.63 n.s.	-		.05
LOGICAL FUNCTION OF TEACHER QUESTIONS:										
8. Low order initial question	1.72 n.s.	.06 n.s.	.22 n.s.	.26 n.s.	1.88 n.s.	1.81 n.s.	1.14 n.s.	-		.001
9. Middle order initial questions	1.08 n.s.	.10 n.s.	.23 n.s.	.19 n.s.	4.15 .048	.10 n.s.	.07 n.s.	-		.001
10. High order initial questions	5.28 .02	.31 n.s.	.01 n.s.	.83 n.s.	.21 n.s.	1.24 n.s.	1.95 n.s.	-		.001
11. High order probing	.10 n.s.	.09 n.s.	2.54 n.s.	.86 n.s.	.01 n.s.	.15 n.s.	.44 n.s.	-		.001

TABLE 8.18 (contd .)

Dependent Variable	Differential Treatment Effects												Overall treatment effects	
	Post-test ANOVAS, or ANCOVAS -- Main and interaction effects												Signif. level for *post hoc* comparisons	Signif. level for paired sample t tests
	P (pupils)		M (media)		Q(qu.level)		P × M		P × Q		M × Q		P × M × Q			Sep. gp. Means	Combined gp. Means
	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level	F	Signif. Level			
TEACHER-PUPIL TALK PATTERNS:																	
12. Amount of teacher talk	1.81	n.s.	1.65	n.s.	.18	n.s.	.80	n.s.	3.40	n.s.	.93	n.s.	.99	n.s.	-		.001
13. Repeating pupil responses	1.95	n.s.	.04	n.s.	1.21	n.s.	5.91	.01	.65	n.s.	.23	n.s.	1.38	n.s.	-		.001
14. Yes/No questions	.52	n.s.	.75	n.s.	.04	n.s.	.00	n.s.	.51	n.s.	.91	n.s.	.00	n.s.	-		n.s.
15. Teacher answering own questions	.33	n.s.	.06	n.s.	1.11	n.s.	2.62	n.s.	.69	n.s.	3.58	n.s.	.01	n.s.	-		.003
16. One ideal pupil responses	1.23	n.s.	1.64	n.s.	.25	n.s.	.23	n.s.	.09	n.s.	2.95	n.s.	.04	n.s.	-		.001
17. Several ideas pupil responses	.45	n.s.	1.35	n.s.	.54	n.s.	.11	n.s.	.88	n.s.	.01	n.s.	.06	n.s.	-		.001
18. Extended ideas pupil responses	.09	n.s.	2.25	n.s.	.42	n.s.	.30	n.s.	.06	n.s.	3.88	.05	.55	n.s.	-		.004
19. Coordinate-reactive pupil responding	2.02	n.s.	1.08	n.s.	.97	n.s.	3.36	n.s.	3.01	n.s.	5.81	.02	1.56	n.s.			.001

1 Underlined F ratios and significant levels indicate use of factorial ANCOVA as the result of significant difference being found between treatment groups on pre-test performance. N = 48; df = 1 and 40 for ANOVAS (1 and 39 for ANCOVAS) for each factor and each interaction of factors.

2 Combined group means for estimating overall effect pre-test to post-test were applicable when: (i) no significant difference was found between groups in the case of pre- and post-test performance; (ii) when factorial ANCOVAS produced a non-significant result. This procedure also applied in the case of variables 2, 9, 10, 13, 18 and 19 where, because the two main and four interaction effects represented less than 5 per cent of the total tests taken (6 out of 19 × 7 tests), the significant results could have been due to chance factors. Complete data on differential and overall effects of treatments are included in TABLE 8.20.

TABLE 8.19 Part 3 Research Design: Overall Effects of Micro-teaching Treatments on Teacher Performance.[1,2]

Dependent Variables	Pre-test Mean	Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control	.69	.84	+ .15	.10	10.03	.001
2. Cognitive episode control	16.54	9.20	-7.34	5.77	8.79	.001
3. Episode sustaining tendency	1.77	2.97	+1.20	1.73	4.78	.001
4. Redirection tendency	.14	.15	+ .01	.16	.33	n.s.
5. Probing tendency	.32	.44	+ .12	.16	5.28	.001
6. Use of pupil ideas	.03	.03	.00	.03	.26	n.s.
7. Structuring with questions	.11	.14	+ .03	.12	1.98	.05
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions	.69	.20	- .49	.21	15.85	.001
9. Middle order initial questions	.21	.32	+ .11	.21	3.53	.001
10. High order initial questions	.09	.47	+ .38	.23	11.36	.001
11. High order probing questions	.25	.51	+ .26	.22	8.15	.001
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk	.52	.35	- .17	.16	7.22	.001
13. Repeating pupil responses	.13	.05	- .08	.12	4.82	.001
14. Yes/No questions	.19	.18	- .01	.12	.62	n.s.
15. Teacher answering own questions	.02	.00	- .02	.03	3.10	.003
16. One idea pupil responses	.57	.44	- .13	.19	4.37	.001
17. Several ideas pupil responses	.34	.40	+ .06	.11	3.77	.001
18. Extended pupil responses	.09	.16	+ .07	.14	3.06	.004
19. Coordinate-reactive pupil responding	.69	.84	+ .15	.10	10.03	.001

1 Paired sample t tests involving pre- and post-test means for all microteaching treatment groups combined: N = 48; df = 47.

2 For ease of interpretation, means in this table are rounded to two decimal places. Complete data on pre- to post-test performance may be found in TABLE 8.15.

TABLE 8.20

Part 3 Research Design: Differential and Overall Effects on Each Dependent Variable of Different Pupil, Media and Question Type Treatments in Microteaching and their Various Combinations.

1. Fluency - control

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0145	1	.0145	2.33	.13
M (Media)	.0153	1	.0153	2.46	.12
Q (Question level)	.0040	1	.0040	.64	.42
P x M	.0192	1	.0192	3.08	.08
P x Q	.0077	1	.0077	1.24	.27
M x Q	.0037	1	.0037	.59	.44
P x M x Q	.0000	1	.0000	.01	.91
Within groups	.2495	40	.0062		
Totals	.3139	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.06 df = 20,20, P = .88 Homogeneity of variance accepted.
Factor M: F = 1.24 df = 20,20, P = .63 Homogeneity of variance accepted.
Factor Q F = 1.06 df = 20,20, P = .89 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .8601
Mp = .8253

Factor M

Mv = .8248
Ma = .8606

Factor Q

Mm = .8335
Mh = .8518

P x M

	Mv	Ma
Mc	.8623	.8580
Mp	.7873	.8632

P x Q

	Mm	Mh
Mc	.8383	.8820
Mp	.8288	.8217

M x Q

	Mm	Mh
Mv	.8068	.8428
Ma	.8603	.8609

P x M x Q

	v		a	
	m	h	m	h
c	.8328	.8917	.8437	.8723
p	.7808	.7938	.8768	.8495

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.6937	.8427	+.1490	.103	10.03	.001

2. Cognitive Episode Control

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	80.0833	1	80.0833	7.43	.009
M (Media)	8.3333	1	8.3333	.77	.38
Q (Question level)	.7500	1	.7500	.06	.79
P x M	1.3333	1	1.3333	.12	.72
P x Q	6.7500	1	6.7500	.62	.43
M x Q	1.3333	1	1.3333	.12	.72
P x M x Q	16.3333	1	16.3333	1.51	.22
Within groups	431.0000	40	10.7750		
Totals	545.9165	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.20 df = 20,20, P = .67 Homogeneity of variance accepted.

Factor M: F = 2.06 df = 20,20, P = .11 Homogeneity of variance accepted.

Factor Q F = 1.80 df = 20,20, P = .19 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = 7.9167

Mp = 10.5000

Factor M

Mv = 9.6250

Ma = 8.7917

Factor Q

Mm = 9.3333

Mh = 9.0833

P x M

	Mv	Ma
Mc	8.1667	7.6687
Mp	11.0833	9.9167

P x Q

	Mm	Mh
Mc	7.6667	8.1667
Mp	11.0000	10.0000

M x Q

	Mm	Mh
Mv	9.5833	9.6667
Ma	9.0833	8.5000

P x M x Q

	v m	v h	a m	a h
c	7.1667	9.1667	8.1667	7.1667
p	12.0000	10.1667	10.0000	9.8333

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/NJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	16.5417	9.2083	-7.3333	5.777	8.79	.001

3. Episode Sustaining Tendency

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	5.0103	1	5.0103	1.87	.17
M (Media)	4.7754	1	4.7754	1.78	.18
Q (Question level)	2.2050	1	2.2050	.82	.36
P x M	.1850	1	.1850	.06	.79
P x Q	4.3633	1	4.3633	1.63	.20
M x Q	.0880	1	.0880	.03	.85
P x M x Q	.2391	1	.2391	.08	.76
Within groups	106.7477	40	2.6686		
Totals	123.6138	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 2.31 df = 20,20, P = .06 Homogeneity of variance accepted.
Factor M: F = 1.20 df = 20,20, P = .68 Homogeneity of variance accepted.
Factor Q F = 1.28 df = 20,20, P = .58 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = 3.2886
Mp = 2.6424

Factor M

Mv = 3.2809
Ma = 2.6501

Factor Q

Mm = 3.1798
Mh = 2.7512

P x M

	Mv	Ma
Mc	3.5419	3.0353
Mp	3.0199	2.2649

P x Q

	Mm	Mh
Mc	3.8044	2.7728
Mp	2.5553	2.7296

M x Q

	Mm	Mh
Mv	3.5381	3.0238
Ma	2.8216	2.4786

P x M x Q

	v m	v h	a m	a h
c	4.1712	2.9127	3.4377	2.6328
p	2.9050	3.1348	2.2055	2.3243

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	1.7689	2.9655	+1.1966	1.734	4.78	.001

4. Redirection Tendency

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0433	1	.0433	.0383	1	.0383	3.31	.07
M (Media)	.0109	1	.0109	.0063	1	.0063	.55	.46
Q (Question level)	.0089	1	.0089	.0113	1	.0113	.98	.32
P x M	.0417	1	.0417	.0431	1	.0431	3.73	.06
P x Q	.0048	1	.0048	.0040	1	.0040	.35	.55
M x Q	.0242	1	.0242	.0250	1	.0250	2.17	.14
P x M x Q	.0027	1	.0027	.0026	1	.0026	.22	.63
Within groups	.4544	40	.0113	.4504	39	.0115		
Totals	.5909	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.75 df = 20,20, P = .21 Homogeneity of variance accepted.

Factor M: F = 1.73 df = 20,20, P = .22 Homogeneity of variance accepted.

Factor Q: F = 1.92 df = 20,20, P = .15 Homogeneity of variance accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0039	1	.0039	.34	.56
Deviations	.4504	39	.0115		
Totals	.4543	40			

The regression accounts for .871 % of the SS.

Treatment Group Means (adjusted)

Factor P

Mc = .1208
Mp = .1780

Factor M

Mv = .1373
Ma = .1615

Factor Q

Mm = .1652
Mh = .1337

P x M

	Mv	Ma
Mc	.0786	.1630
Mp	.1960	.1601

P x Q

	Mm	Mh
Mc	.1459	.0958
Mp	.1845	.1715

M x Q

	Mm	Mh
Mv	.1302	.1444
Ma	.2002	.1229

P x M x Q

	v m	v h	a m	a h
o	.0882	.0691	.2035	.1225
p	.1722	.2197	.1969	.1233

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/NJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.1422	.1494	.0072	.152	.33	n.s.

5. Probing Tendency

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0540	1	.0540	.0517	1	.0517	3.00	.09
M (Media)	.0599	1	.0599	.0325	1	.0325	1.89	.17
Q (Question level)	.0006	1	.0006	.0012	1	.0012	.07	.78
P x M	.0125	1	.0125	.0149	1	.0149	.86	.35
P x Q	.0367	1	.0367	.0454	1	.0454	2.64	.11
M x Q	.0012	1	.0012	.0006	1	.0006	.03	.84
P x M x Q	.0000	1	.0000	.0002	1	.0002	.01	.90
Within groups	.6901	40	.0172	.6719	39	.0172		
Totals	.8550	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.73 df = 20,20, P = .22 Homogeneity of variance accepted.

Factor M: F = 1.12 df = 20,20, P = .79 Homogeneity of variance accepted.

Factor Q: F = 1.19 df = 20,20, P = .68 Homogeneity of variance accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0182	1	.0182	1.05	.31
Deviations	.6719	39	.0172		
Totals	.6901	40			

The regression accounts for 2.638 % of the SS.

Treatment Group Means (adjusted)

Factor P

Mc = .4772
Mp = .4115

Factor M

Mv = .4722
Ma = .4164

Factor Q

Mm = .4494
Mh = .4392

P x M

	Mv	Ma
Mc	.5228	.4316
Mp	.4216	.4013

P x Q

	Mm	Mh
Mc	.5136	.4407
Mp	.3853	.4377

M x Q

	Mm	Mh
Mv	.4736	.4709
Ma	.4253	.4075

P x M x Q

	v m	v h	a m	a h
c	.5533	.4923	.4740	.3892
p	.3939	.4494	.3766	.4259

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/NJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.3263	.4443	+.1180	.155	5.28	.001

6. Use of Pupil Ideas

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0012	1	.0012	.0011	1	.0011	1.24	.27
M (Media)	.0000	1	.0000	.0000	1	.0000	.01	.88
Q (Question level)	.0020	1	.0020	.0028	1	.0028	3.17	.08
P x M	.0007	1	.0007	.0009	1	.0009	1.07	.30
P x Q	.0012	1	.0012	.0008	1	.0008	.91	.34
M x Q	.0041	1	.0041	.0016	1	.0016	1.80	.18
P x M x Q	.0046	1	.0046	.0030	1	.0030	3.31	.07
Within groups	.0390	40	.0009	.0353	39	.0009		
Totals	.0528	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: $F = 2.35$ df =20,20, $P = .06$ Homogeneity of variance accepted.

Factor M: $F = 1.45$ df =20,20, $P = .41$ Homogeneity of variance accepted.

Factor Q: $F = 1.71$ df =20,20, $P = .23$ Homogeneity of variance accepted.

(c) Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0036	1	.0036	4.05	.05
Deviations	.0353	39	.0009		
Totals	.0389	40			

The regression accounts for 9.415 % of the SS.

Treatment Group Means (adjusted)

Factor P		Factor M		Factor Q	
Mc =	.0337	Mv =	.0282	Mm =	.0366
Mp =	.0240	Ma =	.0294	Mh =	.0210

P x M			P x Q			M x Q		
	Mv	Ma		Mm	Mh		Mm	Mh
Mc	.0286	.0388	Mc	.0457	.0217	Mv	.0299	.0266
Mp	.0279	.0201	Mp	.0277	.0204	Ma	.0435	.0155

P x M x Q

	v		a	
	m	h	m	h
o	.0264	.0309	.0651	.0126
p	.0335	.0224	.0219	.0184

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.0275	.0289	.0014	.037	.26	n.s.

7. Structuring with Questions

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0158	1	.0158	1.83	.18
M (Media)	.0048	1	.0048	.56	.45
Q (Question level)	.0275	1	.0275	3.18	.08
P x M	.0076	1	.0076	.88	.35
P x Q	.0201	1	.0201	2.33	.13
M x Q	.0000	1	.0000	.00	.95
P x M x Q	.0054	1	.0054	.63	.43
Within groups	.3455	40	.0086		
Totals	.4267	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 2.47	df = 20,20,	P = .04	Homogeneity of variance not accepted.
Factor M:	F = 2.29	df = 20,20,	P = .07	Homogeneity of variance accepted.
Factor Q	F = 2.22	df = 20,20,	P = .08	Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .1625

Mp = .1262

Factor M

Mv = .1343

Ma = .1544

Factor Q

Mm = .1204

Mh = .1683

P x M

	Mv	Ma
Mc	.1651	.1600
Mp	.1035	.1488

P x Q

	Mm	Mh
Mc	.1591	.1660
Mp	.0818	.1706

M x Q

	Mm	Mh
Mv	.1096	.1590
Ma	.1313	.1776

P x M x Q

	v		a	
	m	h	m	h
c	.1502	.1800	.1680	.1520
p	.0690	.1380	.0945	.2032

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.1099	.1444	+.0345	.120	1.98	.053

8. Asking Low Order Initial Questions

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0665	1	.0665	1.72	.19
M (Media)	.0023	1	.0023	.06	.80
Q (Question level)	.0085	1	.0085	.22	.64
P x M	.0102	1	.0102	.26	.60
P x Q	.0724	1	.0724	1.88	.17
M x Q	.0699	1	.0699	1.81	.18
P x M x Q	.0442	1	.0442	1.14	.29
Within groups	1.5401	40	.0385		
Totals	1.8141	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.41 df = 20,20, P = .44 Homogeneity of variance accepted.
Factor M: F = 1.57 df = 20,20, P = .31 Homogeneity of variance accepted.
Factor Q F = 1.83 df = 20,20, P = .18 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .1602
Mp = .2347

Factor M

Mv = .1905
Ma = .2044

Factor Q

Mm = .2108
Mh = .1841

P x M

	Mv	Ma
Mc	.1386	.1818
Mp	.2423	.2270

P x Q

	Mm	Mh
Mc	.1347	.1858
Mp	.2868	.1825

M x Q

	Mm	Mh
Mv	.1656	.2153
Ma	.2560	.1529

P x M x Q

	v m	v h	a m	a h
c	.0445	.2327	.2248	.1388
p	.2867	.1980	.2870	.1670

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.6873	.1974	— .4898	.214	15.85	.001

9. Asking Middle Order Initial Questions

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0314	1	.0314	.0342	1	.0342	1.08	.31
M (Media)	.0034	1	.0034	.0032	1	.0032	.10	.75
Q (Question level)	.0045	1	.0045	.0074	1	.0074	.23	.63
P x M	.0052	1	.0052	.0059	1	.0059	.19	.67
P x Q	.1281	1	.1281	.1320	1	.1320	4.15	.0
M x Q	.0028	1	.0028	.0033	1	.0033	.10	.75
P x M x Q	.0029	1	.0029	.0021	1	.0021	.07	.80
Within groups	1.2450	40	.0311	1.2407	39	.0318		
Totals	1.4233	47	.0303					

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.0401df =20,20 P = .826 Homogeneity of variance accepted.

Factor M: F = 1.3381df =20,20 P = .520 Homogeneity of variance accepted.

Factor Q: F = 2.3352df =20,20 P = .064 Homogeneity of variance accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0046	1	.0046	.15	.70
Deviations	1.4187	46	.0308		
Totals	1.4233	47			

The regression accounts for .325 % of the SS.

Treatment Group Means (adjusted)

Factor P		Factor M		Factor Q	
Mc =	.3006	Mv =	.3195	Mm =	.3144
Mp =	.3546	Ma =	.3358	Mh =	.3409

P x M

	Mv	Ma
Mc	.2814	.3199
Mp	.3576	.3516

P x Q

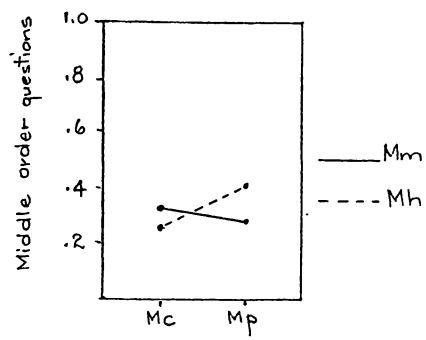
	Mm	Mh
Mc	.3415	.2598
Mp	.2873	.4219

M x Q

	Mm	Mh
Mv	.3145	.3244
Ma	.3145	.3244

P x M x Q

	v m	v h	a m	a h
c	.3238	.2389	.3591	.2807
p	.3052	.4099	.2694	.4338



INTERACTION: P x Q

Tukey Method

Comparison Group	Diff. Between Means	Diff. $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.2189	.3276	+.1088	.213	3.53	.001

10. Asking High Order Initial Questions

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.1893	1	.1893	5.28	.02
M (Media)	.0113	1	.0113	.31	.57
Q (Question level)	.0006	1	.0006	.01	.89
P x M	.0300	1	.0300	.83	.36
P x Q	.0078	1	.0078	.21	.64
M x Q	.0447	1	.0447	1.24	.27
P x M x Q	.0699	1	.0699	1.95	.17
Within groups	1.4340	40	.0358		
Totals	1.7876	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 2.97 df = 20,20, P = .01 Homogeneity of variance not accepted.
Factor M: F = 1.85 df = 20,20, P = .17 Homogeneity of variance accepted.
Factor Q F = 1.04 df = 20,20, P = .93 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .5378
Mp = .4122

Factor M

Mv = .4903
Ma = .4596

Factor Q

Mm = .4714
Mh = .4786

P x M

	Mv	Ma
Mc	.5782	.4974
Mp	.4025	.4218

P x Q

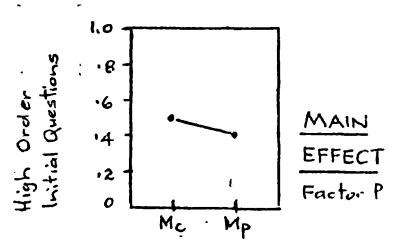
	Mm	Mh
Mc	.5214	.5542
Mp	.4213	.4030

M x Q

	Mm	Mh
Mv	.5173	.4634
Ma	.4255	.4938

P x M x Q

	v m	v h	a m	a h
c	.6305	.5258	.4123	.5825
p	.4040	.4010	.4387	.4050



Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.0940	.4750	+.3810	.232	11.36	.001

11. Asking High Order Probing Questions

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0053	1	.0053	.10	.74
M (Media)	.0050	1	.0050	.09	.75
Q (Question level)	.1290	1	.1290	2.54	.11
P x M	.0438	1	.0438	.86	.35
P x Q	.0006	1	.0006	.01	.91
M x Q	.0077	1	.0077	.15	.69
P x M x Q	.0225	1	.0225	.44	.50
Within groups	2.0315	40	.0507		
Totals	2.2454	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.64	df = 20,20,	P = .27	Homogeneity of variance accepted.
Factor M:	F = 1.64	df = 20,20,	P = .27	Homogeneity of variance accepted.
Factor Q	F = 1.84	df = 20,20,	P = .18	Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .5016
Mp = .5228

Factor M

Mv = .5019
Ma = .5225

Factor Q

Mm = .4603
Mh = .5640

P x M

	Mv	Ma
Mc	.5216	.4817
Mp	.4823	.5633

P x Q

	Mm	Mh
Mc	.4371	.5662
Mp	.4836	.5619

M x Q

	Mm	Mh
Mv	.4465	.5573
Ma	.4741	.5708

P x M x Q

	v		a	
	m	h	m	h
c	.4752	.5680	.3990	.5843
p	.4178	0.5467	.5493	.5772

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/NJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.2509	.5122	+.2613	.222	8.15	.001

12. Amount of Teacher Talk

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0274	1	.0274	1.81	.18
M (Media)	.0249	1	.0249	1.65	.20
Q (Question level)	.0028	1	.0028	.18	.66
P x M	.0122	1	.0122	.80	.37
P x Q	.0513	1	.0513	3.40	.07
M x Q	.0141	1	.0141	.93	.33
P x M x Q	.0149	1	.0149	.99	.32
Within groups	.6038	40	.0150		
Totals	.7514	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.78 df = 20,20, P = .20 Homogeneity of variance accepted.
Factor M: F = 2.08 df = 20,20, P = .10 Homogeneity of variance accepted.
Factor Q F = 1.01 df = 20,20, P = .97 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .3263
Mp = .3741

Factor M

Mv = .3730
Ma = .3274

Factor Q

Mm = .3579
Mh = .3425

P x M

	Mv	Ma
Mc	.3331	.3194
Mp	.4128	.3353

P x Q

	Mm	Mh
Mc	.3668	.2858
Mp	.3491	.3991

M x Q

	Mm	Mh
Mv	.3635	.3824
Ma	.3523	.3025

P x M x Q

	v		a	
	m	h	m	h
c	.3387	.3275	.3947	.2442
p	.3883	.4373	.3098	.3608

Tukey Method

Comparison Group	Diff. Between Means	Diff. / √MSw/nJ	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.5199	.3502	-.1609	.163	7.22	.001

13. Teacher Repetition of Pupil Responses

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0072	1	.0072	.0073	1	.0073	1.95	.17
M (Media)	.0011	1	.0011	.0001	1	.0001	.04	.83
Q (Question level)	.0044	1	.0044	.0045	1	.0045	1.21	.27
P x M	.0227	1	.0227	.0221	1	.0221	5.91	.01
P x Q	.0032	1	.0032	.0024	1	.0024	.65	.42
M x Q	.0012	1	.0012	.0008	1	.0008	.23	.63
P x M x Q	.0069	1	.0069	.0051	1	.0051	1.38	.24
Within groups	.1486	40	.0037	.1463	39	.0037		
Totals	.1953	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: $F = 2.51$ df = 20,20, P = .04 Homogeneity of variance not accepted.

Factor M: $F = 1.15$ df = 20,20, P = .74 Homogeneity of variance accepted.

Factor Q: $F = 1.04$ df = 20,20, P = .92 Homogeneity of variance accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0023	1	.0023	.61	.43
Deviations	.1463	39	.0037		
Totals	.1486	40			

The regression accounts for 1.559 % of the SS.

Treatment Group Means (adjusted)

Factor P		Factor M		Factor Q	
Mc =	.0376	Mv =	.0519	Mm =	.0597
Mp =	.0623	Ma =	.0480	Mh =	.0402

P x M

	Mv	Ma
Mc	.0181	.0572
Mp	.0858	.0388

P x Q

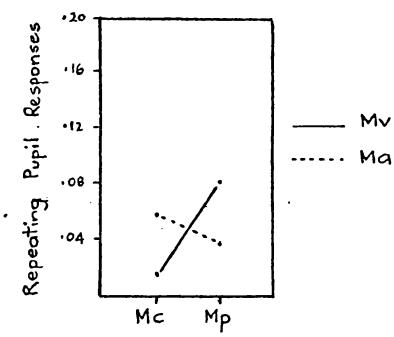
	Mm	Mh
Mc	.0546	.0206
Mp	.0648	.0598

M x Q

	Mm	Mh
Mv	.0574	.0464
Ma	.0620	.0340

P x M x Q

	v		a	
	m	h	m	h
o	.0201	.0160	.0890	.0253
p	.0947	.0769	.0350	.0426



INTERACTION: P x M

Tukey Method (adjusted means)

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.1342	.0500	-.0842	.121	4.82	.001

14. Asking Yes/ No Questions

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0042	1	.0042	.52	.47
M (Media)	.0060	1	.0060	.75	.39
Q (Question level)	.0003	1	.0003	.04	.83
P x M	.0000	1	.0000	.00	.98
P x Q	.0041	1	.0041	.51	.47
M x Q	.0073	1	.0073	.91	.34
P x M x Q	.0000	1	.0000	.00	.97
Within groups	.3218	40	.0080		
Totals	.3437	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.46 df = 20,20, P = .39 Homogeneity of variance accepted.
Factor M: F = 1.55 df = 20,20, P = .33 Homogeneity of variance accepted.
Factor Q F = 1.74 df = 20,20, P = .22 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .1872
Mp = .1683

Factor M

Mv = .1890
Ma = .1665

Factor Q

Mm = .1805
Mh = .1750

P x M

	Mv	Ma
Mc	.1986	.1758
Mp	.1794	.1573

P x Q

	Mm	Mh
Mc	.1806	.1938
Mp	.1803	.1563

M x Q

	Mm	Mh
Mv	.2041	.1739
Ma	.1568	.1762

P x M x Q

	v		a	
	m	h	m	h
c	.2040	.1932	.1572	.1943
p	.2042	.1547	.1565	.1580

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.1884	.1778	- .0106	.119	.62	n.s.

15. Teacher Answering His Own Questions

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0000	1	.0000	.0000	1	.0000	.33	.56
M (Media)	.0000	1	.0000	.0000	1	.0000	.06	.80
Q (Question level)	.0000	1	.0000	.0000	1	.0000	1.11	.29
P x M	.0001	1	.0001	.0001	1	.0001	2.62	.11
P x Q	.0000	1	.0000	.0000	1	.0000	.69	.40
M x Q	.0002	1	.0002	.0002	1	.0002	3.58	.06
P x M x Q	.0000	1	.0000	.0000	1	.0000	.01	.89
Within groups	.0027	40	.0000	.0027	39	.0000		
Totals	.0030	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: $F = 1.48$ $df = 20,20$, $P = .38$ Homogeneity of variance accepted.

Factor M: $F = 1.78$ $df = 20,20$, $P = .20$ Homogeneity of variance accepted.

Factor Q: $F = 3.13$ $df = 20,20$, $P = .01$ Homogeneity of variance not accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0000	1	.0000	.03	.86
Deviations	.0027	39	.0000		
Totals	.0027	40			

The regression accounts for .079 % of the SS.

Treatment Group Means (adjusted)

Factor P		Factor M		Factor Q	
Mc =	.0024	Mv =	.0028	Mm =	.0044
Mp =	.0038	Ma =	.0034	Mh =	.0018

P x M			P x Q			M x Q		
	Mv	Ma		Mm	Mh		Mm	Mh
Mc	.0001	.0047	Mc	.0048	.0000	Mv	.0018	.0038
Mp	.0054	.0022	Mp	.0040	.0036	Ma	.0071	.0001

P x M x Q

	v		a	
	m	h	m	h
o	.0000	.0002	.0096	.0001
p	.0036	.0073	.0045	.0001

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.0167	.0031	−.0135	.030	3.10	.003

16. One Idea Pupil Responses

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0207	1	.0207	.0248	1	.0248	1.23	.27
M (Media)	.0449	1	.0449	.0330	1	.0330	1.64	.20
Q (Question level)	.0029	1	.0029	.0050	1	.0050	.25	.61
P x M	.0048	1	.0048	.0047	1	.0047	.23	.63
P x Q	.0020	1	.0020	.0018	1	.0018	.09	.76
M x Q	.0567	1	.0567	.0594	1	.0594	2.95	.09
P x M x Q	.0008	1	.0008	.0008	1	.0008	.04	.84
Within groups	.7883	40	.0197	.7839	39	.0201		
Totals	.9211	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.16 df = 20,20, P = .73 Homogeneity of variance accepted.

Factor M: F = 1.42 df = 20,20, P = .43 Homogeneity of variance accepted.

Factor Q: F = 1.05 df = 20,20, P = .89 Homogeneity of variance accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0044	1	.0044	.22	.64
Deviations	.7839	39	.0201		
Totals	.7883	40			

The regression accounts for .565 % of the SS.

Treatment Group Means (adjusted)

Factor P		Factor M		Factor Q	
Mc =	.4187	Mv =	.4701	Mm =	.4319
Mp =	.4665	Ma =	.4151	Mh =	.4534

P x M			P x Q			M x Q		
	Mv	Ma		Mm	Mh		Mm	Mh
Mc	.4363	.4011	Mc	.4017	.4357	Mv	.4947	.4455
Mp	.5040	.4291	Mp	.4620	.4710	Ma	.3690	.4612

P x M x Q

	v		a	
	m	h	m	h
c	.4588	.4138	.3446	.4576
p	.5307	.4773	.3934	.4648

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSw/nJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.5678	.4426	-.1252	.199	4.37	.001

17. Several Ideas Pupil Responses

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0039	1	.0039	.45	.50
M (Media)	.0117	1	.0117	1.35	.25
Q (Question level)	.0047	1	.0047	.54	.46
P x M	.0009	1	.0009	.11	.74
P x Q	.0077	1	.0077	.88	.35
M x Q	.0001	1	.0001	.01	.90
P x M x Q	.0005	1	.0005	.06	.80
Within groups	.3481	40	.0087		
Totals	.3776	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.42 df = 20,20, P = .43 Homogeneity of variance accepted.
Factor M: F = 1.14 df = 20,20, P = .75 Homogeneity of variance accepted.
Factor Q F = 1.73 df = 20,20, P = .22 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .4057
Mp = .3875

Factor M

Mv = .3809
Ma = .4122

Factor Q

Mm = .4065
Mh = .3867

P x M

	Mv	Ma
Mc	.3945	.4168
Mp	.3673	.4076

P x Q

	Mm	Mh
Mc	.4283	.3831
Mp	.3847	.3903

M x Q

	Mm	Mh
Mv	.3893	.3726
Ma	.4237	.4008

P x M x Q

	v		a	
	m	h	m	h
c	.4188	.3702	.4377	.3960
p	.3597	.3750	.4097	.4055

Tukey Method

Comparison Group	Diff. Between Means	Diff. / $\sqrt{MSW/NJ}$	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.3350	.3966	+.0615	.113	3.77	.001

18. Extended Ideas Pupil Responses

(a) Difference Between Treatment Groups

Analysis of Covariance - effect of treatments on adjusted means (intercepts)

Source of Variation	SS	df	MS	SS	df	MS	F	P
P (Pupils)	.0064	1	.0064	.0008	1	.0008	.09	.75
M (Media)	.0105	1	.0105	.0204	1	.0204	2.25	.14
Q (Question level)	.0002	1	.0002	.0038	1	.0038	.42	.51
P x M	.0014	1	.0014	.0027	1	.0027	.30	.58
P x Q	.0018	1	.0018	.0005	1	.0005	.06	.80
M x Q	.0518	1	.0518	.0352	1	.0352	3.88	.05
P x M x Q	.0027	1	.0027	.0050	1	.0050	.55	.46
Within groups	.3733	40	.0093	.3542	39	.0090		
Totals	.4481	47						

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.13 df =20,20, P = .78 Homogeneity of variance accepted.

Factor M: F = 1.38 df =20,20, P = .47 Homogeneity of variance accepted.

Factor Q: F = 1.44 df =20,20, P = .41 Homogeneity of variance accepted.

Joint Residual (within treatment) Variation related to ANCOVA

Regression Analysis of Variance

Source of Variation	SS	df	MS	F	P
Regression	.0190	1	.0190	2.10	.15
Deviations	.3542	39	.0090		
Totals	.3732	40			

The regression accounts for 5.114 % of the SS.

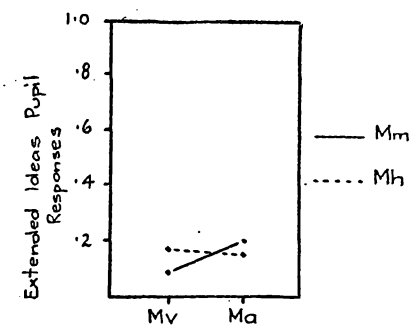
Treatment Group Means (adjusted)

Factor P		Factor M		Factor Q	
Mc =	.1653	Mv =	.1389	Mm =	.1512
Mp =	.1563	Ma =	.1827	Mh =	.1704

P x M			P x Q			M x Q		
	Mv	Ma		Mm	Mh		Mm	Mh
Mc	.1510	.1796	Mc	.1523	.1784	Mv	.1014	.1764
Mp	.1268	.1857	Mp	.1502	.1624	Ma	.2010	.1643

P x M x Q

	v		a	
	m	h	m	h
o	.0997	.2023	.2048	.1544
p	.1031	.1505	.1972	.1743



INTERACTION: M x Q

Tukey Method

Comparison Group	Diff. Between Means	Diff. / √MSw/NJ	Level of Signif.
—	—	—	—

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.0964	.1608	+.0644	.146	3.06	.004

19. Coordinate-reactive Responding Patterns

(a) Difference Between Treatment Groups on Posttest Performance

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0698	1	.0698	2.02	.163
M (Media)	.0375	1	.0375	1.08	.305
Q (Question level)	.0338	1	.0338	.97	.330
P x M	.1165	1	.1165	3.36	.074
P x Q	.1044	1	.1044	3.01	.090
M x Q	.2014	1	.2014	5.81	.021
P x M x Q	.0541	1	.0541	1.56	.219
Within groups	1.3858	40	.0346		
Totals	2.0033	47	.0426		

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.3631 df = 20,20 P = .494 Homogeneity of variance accepted.

Factor M: F = 1.0395 df = 20,20 P = .931 Homogeneity of variance accepted.

Factor Q F = 1.2861 df = 20,20 P = .579 Homogeneity of variance accepted.

Treatment Group Means

Factor P

Mc = .5433

Mp = .4670

Factor M

Mv = .4773

Ma = .5331

Factor Q

Mm = .4787

Mh = .5317

P x M

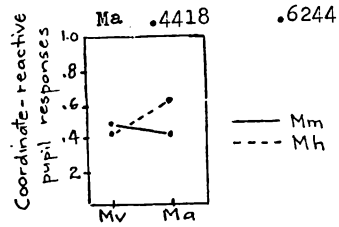
	Mv	Ma
Mc	.5647	.5220
Mp	.3898	.5443

P x Q

	Mm	Mh
Mc	.4702	.6165
Mp	.4872	.4470

M x Q

	Mm	Mh
Mv	.5155	.4390
Ma	.4418	.6244



INTERACTION: M x Q

P x M x Q

	v m	v h	a m	a h
c	.5898	.5395	.3505	.6935
p	.4412	.3385	.5332	.5553

Tukey Method

Comparison Group	Diff. Between Means	Diff. / √MSw/NJ	Level of Signif.

(b) Change Pretest to Posttest for Treatment Groups

Treatment Group and N	Pretest Mean	Posttest Mean	Mean Diff.	S.D.	T	2-Tail Prob.
Combined mean for all microteaching treatments (48)	.3336	.5052	+.1716	.224	5.30	.001

Table 8.21 Opinions concerning the general effectiveness of the microteaching programme.

M = all microteachers
CV = children-video treatment group
CA = children-audio treatment group
PV = peers-video treatment group
PA = peers-audio treatment group

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1A.01	Microteaching is an effective way of learning to use questioning and reacting skills. Means: M= 4.8 (n=48) CV= 4.8 CA= 4.8 PV= 4.8 PA= 4.9	79.2 (5)	20.8			 (1)
1A.02	As a result of this course, my repertoire of questioning and reacting skills has increased. Means: M= 4.6 (n=48) CV= 4.7 CA= 4.7 PV= 4.7 PA= 4.5	68.8 (5)	27.1	4.2		 (1)
1A.03	There is value in analysing teaching in terms of verbal skills. Means: M= 4.4 (n=48) CV= 4.5 CA= 4.4 PV= 4.6 PA= 4.3	47.9 (5)	47.9	4.2		 (1)
1A.04	Microteaching lacks reality. Means: M= 3.9 (n=48) CV= 3.9 CA= 3.8 PV= 3.9 PA= 4.1	 (1)	8.3	14.6	50.0	27.1 (5)
1A.05	I clearly understood the objectives of the course. Means: M= 4.1 (n=48) CV= 4.2 CA= 4.3 PV= 4.0 PA= 4.1	20.8 (5)	70.8	8.3		 (1)
1A.06	It was possible in this course to learn a great deal from observing fellow students teach. Means: M= 4.4 (n=48) CV= 4.4 CA= 4.7 PV= 4.3 PA= 4.1	45.8 (5)	45.8	8.3		 (1)
1A.07	During this course, I found myself analysing questioning and reacting skills that were being used in other college classes as well as during observation visits to schools. Means: M= 4.2 (n=48) CV= 4.5 CA= 3.8 PV= 4.3 PA= 4.1	35.4 (5)	54.2	2.1	8.3	 (1)
1A.08	Microteaching and the skills approach in this course tended to "cramp my personal teaching style." Means: M= 4.4 (n=48) CV= 4.1 CA= 4.4 PV= 4.5 PA= 4.4	 (1)		10.4	43.8	45.8 (5)
1A.09	Experiences in this course enabled me to "pick up" skills additional to those included in the actual course objectives. Means: M= 3.9 (n=48) CV= 4.1 CA= 3.9 PV= 3.8 PA= 3.8	20.8 (5)	50.0	27.1	2.1	 (1)

Table 8 21(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1A.10	Before this course, I was already confident and competent in using the skills upon which the course focused. Means: M= 4.4 (n=48) CV= 4.3 CA= 4.5 PV= 4.3 PA= 4.3	2.1 (1)		8.3	39.6	50.0 (5)
1A.11	The skills emphasised in this course were mostly new to me. Means: M= 3.4 (n=48) CV= 3.2 CA= 3.3 PV= 3.7 PA= 3.6	6.3 (5)	56.3	14.6	18.8	4.2 (1)
1B.12	My interest was maintained throughout the course. Means: M= 4.4 (n=48) CV= 4.3 CA= 4.4 PV= 4.5 PA= 4.2	43.8 (5)	47.9	8.3		(1)
1B.13	My interest lessened as the course progressed. Means: M= 4.3 (n=48) CV= 4.4 CA= 4.1 PV= 4.4 PA= 4.1	(1)	4.2	8.3	45.8	41.7 (5)
1B.14	Having a wide repertoire of questioning and reacting skills is important to a teacher. Means: M= 4.9 (n=48) CV= 5.0 CA= 4.9 PV= 4.8 PA= 4.8	87.5 (5)	12.5			(1)
1C.15	This microteaching course should be a required course for all students at some point in their three years at college. Means: M= 4.8 (n=48) CV= 4.8 CA= 4.9 PV= 4.8 PA= 4.7	83.3 (5)	14.6	2.1		(1)
1C.16	This microteaching course should be on a voluntary participation basis only. Means: M= 3.9 (n=48) CV= 3.8 CA= 4.0 PV= 3.8 PA= 3.9	(1)	8.3	16.7	54.2	20.8 (5)
1C.17	This microteaching course should be made available earlier than in the third year at college. Means: M= 3.6 (n=48) CV= 3.8 CA= 3.5 PV= 3.4 PA= 3.6	22.9 (5)	25.0	37.5	14.6	(1)
1C.18	I would be keen to participate in other microteaching courses on further sets of teaching skills. Means: M= 4.5 (n=48) CV= 4.7 CA= 4.3 PV= 4.5 PA= 4.6	56.3 (5)	39.6	4.2		(1)

Table 8.21(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1C.19	Microteaching should be built into all studies in teaching courses in college. Means: M= 4.1 (n=48) CV= 4.3 CA= 4.0 PV= 4.2 PA= 4.1	39.6 (5)	39.6	14.6	6.3	 (1)
1C.20	It would be helpful on school section if visiting college lecturers used some kind of coding system to provide objective data about my teaching for discussion purposes. Means: M= 4.0 (n=48) CV= 4.5 CA= 3.9 PV= 4.0 PA= 3.8	31.3 (5)	47.9	14.6	6.3	 (1)
1C.21	Skills emphasised in this course could be used across a wide range of curriculum areas. Means: M= 4.7 (n=48) CV= 4.8 CA= 4.7 PV= 4.7 PA= 4.5	66.7 (5)	31.3	2.1		 (1)
1C.22	Skills emphasised in this course could be used with larger pupil groups or a whole class. Means: M= 4.3 (n=48) CV= 4.8 CA= 4.8 PV= 4.6 PA= 4.7	47.9 (5)	39.6	6.3	6.3	 (1)
1C.23	I think I will be able to transfer knowledge and use of skills gained in this course to my classroom teaching. Means: M= 4.7 (n=48) CV= 4.8 CA= 4.8 PV= 4.6 PA= 4.7	68.8 (5)	31.2			 (1)
2.01	My microteaching group developed very much as a mutually supportive group. Means: M= 4.3 (n=48) CV= 4.3 CA= 4.2 PV= 4.5 PA= 4.4	39.6 (5)	54.2	6.3		 (1)
2.02	My microteaching group worked mainly as individuals, constantly competing with each other. Means: M= 4.5 (n=48) CV= 4.5 CA= 4.4 PV= 4.5 PA= 4.5	 (1)		6.3	39.6	54.2 (5)
2.03	In addition to learning how to use certain verbal teaching skills, this course helped me develop skill in working effectively as a team member. Means: M= 3.9 (n=48) CV= 4.0 CA= 3.8 PV= 4.0 PA= 3.8	20.8 (5)	52.1	20.8	6.3	 (1)

Table 8.22 Opinions concerning components within the microteaching format.

M = all microteachers
CV = children-video treatment group
CA = children-audio treatment group
PV = peers-video treatment group
PA = peers-audio treatment group

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3A.01	Studying and practising a cluster of related skills in each laboratory was a useful approach. Means: M= 4.3 CV= 4.3 PV= 4.3 (n=48) CA= 4.3 PA= 4.4	37.5 (5)	54.2	8.3		(1)
3A.02	A "one skill at a time" approach (thus more teaching laboratories) would have been more desirable than the cluster of related skills approach. Means: M= 3.9 CV= 3.8 PV= 3.6 (n=48) CA= 3.9 PA= 4.4	(1)	6.3	14.6	58.3	20.8 (5)
3A.03	The sequencing of the skills clusters, laboratory to laboratory, enabled me to build up my questioning and reacting repertoire in a gradual and meaningful way. Means: M= 4.4 CV= 4.5 PV= 4.3 (n=48) CA= 4.4 PA= 4.3	43.8 (5)	50.0	6.3		(1)
3A.04	Starting with closed and open initial questions was a good "lead-up" to low, middle and high order initial questions. Means: M= 4.4 CV= 4.4 PV= 4.6 (n=48) CA= 4.3 PA= 4.3	45.8 (5)	47.9	6.3		(1)
3B.05	In the first session of each teaching laboratory, each of the components listed below made a valuable contribution to learning about the skills:					
	(a) Starting off the session with a review discussion of the skills. M= 4.5 (n=48) CV=4.5 CA=4.3 PV=4.6 PA=4.5	50.0 (5)	47.9		2.1	(1)
	(b) The cued sample of teaching demonstrating the skills. M= 4.1 (n=48) CV=4.7 CA=3.6 PV=4.3 PA=3.8	41.7 (5)	35.4	14.6	8.3	(1)
	(c) The transcript of the cued sample of teaching. M= 3.8 (n=48) CV=4.0 CA=3.7 PV=4.0 PA=3.5	25.0 (5)	37.5	29.2	8.3	(1)
	(d) The second non-cued sample of teaching for minute-by-minute analysis. M=4.4 (n=48) CV=4.5 CA=4.3 PV=4.5 PA=4.3	41.7 (5)	54.2	4.2		(1)
	(e) Group work on the exercises related to the skills. M=4.3 (n=48) CV=4.3 CA=4.2 PV=4.5 PA= 4.3	45.8 (5)	41.7	12.5		(1)

Table 8.22(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3C.06	The teaching laboratory books were generally helpful to me in understanding the nature and purposes of the different skills. Means: M= 4.7 (n=48) CV= 4.8 CA= 4.6 PV= 4.8 PA= 4.6	66.7 (5)	33.3			 (1)
3C.07	The features of the laboratory books listed below were special strength:					
	(a) Appearance, setting out, format.	54.2 (5)	39.6	6.3		 (1)
	(b) Clearly stated objectives. M=4.5 (n=48) CV=4.7 CA=4.3 PV=4.4 PA=4.6	39.6 (5)	60.4			 (1)
	(c) Clear description of the skills. M=4.4 (n=48) CV=4.5 CA=4.1 PV=4.5 PA=4.5	62.5 (5)	37.5			 (1)
	(d) Appropriate use of diagrams. M=4.6 (n=48) CV=4.8 CA=4.5 PV=4.6 PA=4.7	25.0 (5)	50.0	20.8	4.2	 (1)
	(e) Technical language at a reasonable level. M=4.0 (n=48) CV=4.3 CA=4.0 PV=3.8 PA= 3.8	45.8 (5)	43.8	6.3	4.2	 (1)
	(f) Usefulness as a reference when planning microteaching sessions. M=4.3 (n=48) CV=4.6 CA= 4.1 PV=4.3 PA=4.3	77.1 (5)	20.8	2.1		 (1)
	M=4.8 (n=48) CV=4.8 CA= 4.8 PV=4.8 PA=4.7					
3D.08	Feedback of some kind on one's teaching is necessary to be able to achieve greater control over a wide repertoire of teaching skills. Means: M= 4.6 (n=48) CV= 4.8 CA= 4.6 PV= 4.7 PA= 4.3	60.4 (5)	35.4	4.2		 (1)
3D.09	Self-analysis, aided by objective data and objective comments from the group, helped me learn to use a wide repertoire of questioning and reacting skills. Means: M= 4.4 (n=48) CV= 4.5 CA= 4.3 PV= 4.5 PA= 4.3	45.8 (5)	47.9	6.3		 (1)
3D.10	Having a turn at frequency counting the different skills in Laboratories 1, 2 and 3 helped increase my sensitivity to the skills. Means: M= 4.4 (n=48) CV= 4.4 CA= 4.4 PV= 4.3 PA= 4.4	39.6 (5)	58.3	2.1		 (1)
3D.11	In each successive "microteach," I generally tried to incorporate ideas resulting from earlier feedback sessions on my teaching. Means: M= 4.2 (n=48) CV= 4.5 CA= 3.9 PV= 4.7 PA= 3.8	37.5 (5)	52.1	6.3	4.2	 (1)
3D.12	The SCAIES coding system provides useful information about one's teaching. Means: M= 4.6 (n=48) CV= 4.8 CA= 4.7 PV= 4.3 PA= 4.7	66.7 (5)	27.1	6.3		 (1)

Table 8.22(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3D.13	The SQAIES coding system is easy to learn to use. Means: M= 3.9 CV= 4.2 PV= 3.9 (n=48) CA= 3.8 PA= 3.8	18.8 (5)	64.6	8.3	6.3	2.1 (1)
3D.14	The SQAIES coding system was introduced at an appropriate point in the course. Means: M= 4.5 CV= 4.6 PV= 4.6 (n=48) CA= 4.2 PA= 4.7	56.3 (5)	39.6	2.1	2.1	 (1)
3D.15	Data derived from the SQAIES coding system is more useful than data from frequency counting of skills. Means: M= 4.1 CV= 3.8 PV= 3.9 (n=48) CA= 4.3 PA= 4.4	35.4 (5)	43.8	16.7	4.2	 (1)
3D.16	In Laboratories 1, 2 and 3, the period of 5 - 7 minutes for feedback discussion was adequate for me to analyse main points about my teaching. Means: M= 3.8 CV= 3.9 PV= 3.9 (n=48) CA= 3.5 PA= 3.9	18.8 (5)	56.3	12.5	12.5	 (1)
3D.17	The feedback guidesheet for each laboratory was a useful item. Means: M= 4.1 CV= 4.3 PV= 3.8 (n=48) CA= 4.1 PA= 4.2	20.8 (5)	66.7	12.5		 (1)
3D.18	Feeding data and ideas to a microteacher in an objective way was a difficult task for me. Means: M= 2.9 CV= 2.8 PV= 3.2 (n=48) CA= 2.8 PA= 3.1	4.2 (1)	33.3	29.2	31.3	2.1 (5)
3D.19	During feedback discussion sessions, fellow-students tended to make open value-judgments about my teaching. Means: M= 4.0 CV= 4.2 PV= 3.8 (n=48) CA= 3.8 PA= 4.4	6.3 (1)	6.3	8.3	35.4	43.8 (5)
3D.20	Receiving open value-judgments about my teaching from the group would have been more helpful than keeping feedback discussion sessions objective in nature. Means: M= 3.4 CV= 3.3 PV= 3.5 (n=48) CA= 3.3 PA= 3.3	6.3 (1)	14.6	37.5	20.8	20.8 (5)

Table 8.22(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3D.21	A group supervisor should value-judge a microteacher's efforts as effective or ineffective, and then tell the microteacher exactly how to remedy any weak points. Means: M= 3.9 CV= 4.3 PV= 3.7 (n=48) CA= 3.9 PA= 3.7	2.1 (1)	4.2	27.1	37.5	29.2 (5)
3D.22	A group supervisor should value-judge a microteacher's efforts as effective or ineffective, and then guide the microteacher to work out for himself how to overcome any weak points. Means: M= 3.1 CV= 3.5 PV= 2.5 (n=48) CA= 3.5 PA= 2.9	6.3 (1)	31.3	18.8	33.3	10.4 (5)
3D.23	A play-back of my microteaching was all that was really necessary for me to work out my strengths and difficulties with the skills. Means: M= 3.4 CV= 3.8 PV= 3.3 (n=48) CA= 3.3 PA= 3.1	6.3 (1)	20.8	12.5	52.1	8.3 (5)
3D.24	Rather than a feedback session with fellow-students and the supervisor, I would have preferred a private discussion with the supervisor. Means: M= 4.3 CV= 4.3 PV= 4.3 (n=48) CA= 4.1 PA= 4.5	(1)		4.2	60.4	35.4 (5)
3E.25	The supervisor plays an important role in microteaching work. Means: M= 4.4 CV= 4.7 PV= 4.1 (n=48) CA= 4.5 PA= 4.5	50.0 (5)	45.8	2.1	2.1	(1)
3E.26	A change of supervisors, laboratory to laboratory, would have been a desirable thing. Means: M= 4.1 CV= 3.5 PV= 4.4 (n=48) CA= 4.1 PA= 4.4	6.3 (1)		10.4	43.8	39.6 (5)
3E.27	All microteachers should use the same way of setting out planning for discussion sessions, and this should be checked by the supervisor. Means: M= 4.2 CV= 4.2 PV= 4.0 (n=48) CA= 4.2 PA= 4.3	2.1 (1)	2.1	10.4	50.0	35.4 (5)
3E.28	Setting out of planning for a discussion session should be an individual matter, but guidenotes like those provided in Laboratory 3 are useful. Means: M=4.4 CV= 4.4 PV= 4.4 (n=48) CA= 4.2 PA= 4.7	43.8 (5).	54.2	2.1		(1)

Table 8.23 Opinions concerning the organisation of the microteaching programme.

M = all microteachers
CV = children-video treatment group
CA = children-audio treatment group
PV = peers-video treatment group
PA = peers-audio treatment group

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
4.01	The organisation of this course enabled it to run smoothly. Means: M= 4.4 (n=48) CV= 4.4 CA= 4.3 PV= 4.3 PA= 4.5	41.7 (5)	54.2	2.1	2.1	 (1)
4.02	One term with two 1½ hour sessions per week was an appropriate schedule for achieving the course objectives. Means: M= 3.9 (n=48) CV= 3.8 CA= 4.1 PV= 3.8 PA= 4.0	16.7 (5)	66.7	8.3	8.3	 (1)
4.03	Working full-time on microteaching over several weeks would be more desirable than extending the course over a term. Means: M= 3.9 (n=48) CV= 3.8 CA= 3.8 PV= 3.9 PA= 3.8	2.1 (1)	4.2	20.8	52.1	20.8 (5)
4.04	I would have preferred to have had more turns at microteaching. Means: M= 2.9 (n=48) CV= 2.3 CA= 2.7 PV= 3.2 PA= 3.6	6.3 (1)	37.5	14.6	39.6	2.1 (5)
4.05	It was appropriate to have three microteaching sessions in a 1½ hour period. Means: M= 3.5 (n=48) CV= 3.8 CA= 3.2 PV= 3.6 PA= 3.4	4.2 (5)	58.3	20.8	14.6	2.1 (1)
4.06	A re-teach opportunity should have been provided in every teaching laboratory. Means: M= 2.8 (n=48) CV= 2.5 CA= 2.5 PV= 2.7 PA= 3.3	8.3 (1)	33.3	33.3	25.0	 (5)
4.07	The time interval between each of my microteaching sessions was appropriate. Means: M= 3.9 (n=48) CV= 3.6 CA= 3.8 PV= 4.1 PA= 4.3	10.4 (5)	75.0	12.5	2.1	 (1)
4.08	The microteaching discussion lessons were too short. Means: M= 3.6 (n=48) CV= 3.6 CA= 3.5 PV= 3.9 PA= 3.3	2.1 (1)	12.5	14.6	66.7	4.2 (5)
4.09	A strength of the course was the opportunity to work in a small group situation with a supervisor. Means: M= 4.7 (n=48) CV= 4.7 CA= 4.8 PV= 4.7 PA= 4.7	68.8 (5)	31.3			 (1)

Table 8.23 (contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (all microteachers) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
4.10	Being in the first set of persons to teach in each laboratory was more advantageous than being in the second set. Means: M= 3.6 CV= 3.6 PV= 3.7 (n=48) CA= 3.5 PA= 3.7	(1)	4.2	37.5	52.1	6.3 (5)
4.11	Special lectures on theoretical ideas at several points in the course, would be more desirable than the approach of letting theoretical ideas emerge from discussion. Means: M= 4.1 CV= 3.8 PV= 4.3 (n=48) CA= 4.2 PA= 4.2	2.1 (1)	2.1	16.7	43.8	35.4 (5)
4.12	More skills should have been included in the course. Means: M= 3.7 CV= 3.6 PV= 3.9 (n=48) CA= 3.7 PA= 3.7	(1)	6.3	22.9	64.6	6.3 (5)
4.13	Work pressures related to other college courses often kept me from devoting as much time to study of my laboratory books as I would have liked to have done. Means: M= 2.7 CV= 2.6 PV= 2.6 (n=48) CA= 2.4 PA= 3.2	16.7 (1)	39.6	6.3	33.3	4.2 (5)

Table 8.24 Opinions concerning the microteaching of school children.

CV = children-video treatment group
CA = children-audio treatment group

CODE	ITEMS	PER CENTAGE RESPONSES (CV + CA treatments)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
4.15	Teaching a small group of 5 children is an effective way of developing a wide repertoire of questioning and reacting skills. Means: CV + CA = 4.1 (n=24) CV= 3.9 CA= 4.3	25.0 (5)	62.5	8.3	4.2	(1)
2.05	Teaching a small group of children in front of fellow-students was an uncomfortable and inhibiting experience. Means: CV + CA = 3.8 (n=24) CV= 4.0 CA= 3.5	(1)	8.3	29.2	41.7	20.8 (5)
5.06	It was easy to establish rapport with the children I taught. Means: CV + CA = 3.8 (n=24) CV= 3.9 CA= 3.8	29.2 (5)	33.3	29.2	8.3	(1)
4.17	Some warm-up sessions with the children would have been desirable before any analysis of my teaching occurred. Means: CV + CA = 2.8 (n=24) CV= 3.0 CA= 2.5	8.3 (1)	33.3	33.3	25.0	(5)
4.18	It was important to teach the same group of children throughout the course. Means: CV + CA = 4.4 (n=24) CV= 4.4 CA= 4.4	50.0 (5)	41.7	8.3		(1)
5.08	During microteaching sessions, discipline was frequently a problem. Means: CV + CA = 4.1 (n=24) CV= 4.5 CA= 3.8	(1)	8.3	8.3	45.8	37.5 (5)
4.20	It was appropriate to be given the freedom to choose my own topics for my microteaching sessions. Means: CV + CA = 4.5 (n=24) CV= 4.5 CA= 4.6	58.3 (5)	37.5	4.2		(1)
5.10	I would have preferred to teach a small group of fellow-students as my "pupils" rather than a small group of children. Means: CV + CA = 4.1 (n=24) CV= 3.8 CA= 4.3	(1)		25.0	41.7	33.3 (5)

Table 8·25 Opinions concerning the simulated microteaching of student teacher peers.

PV = peers-video treatment group
PA = peers-audio treatment group

CODE	ITEMS	PER CENTAGE REPONSES (PV + PA treatments)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
4.14	Teaching a small group of 5 fellow-students is an effective way of developing a wide repertoire of questioning and reacting skills. Means: PV + PA = 4.2 (n=24) PV= 4.3 PA= 4.2	29.2 (5)	62.5	8.3		(1)
2.04	Teaching fellow-students was an uncomfortable and inhibiting experience. Means: PV + PA = 4.3 (n=24) PV= 4.5 PA= 4.2	(1)		4.2	58.3	37.5 (5)
5.01	Being a"pupil" for a fellow-student helped me develop sensitivity to the teaching skills being practised. Means: PV + PA = 4.2 (n=24) PV= 4.2 PA= 4.3	29.2 (5)	62.5	8.3		(1)
5.02	It was difficult being a "pupil" for fellow-students. Means: PV + PA = 4.0 (n=24) PV= 4.2 PA= 3.8	(1)	8.3	4.2	66.7	20.8 (5)
5.04	It was easy to establish rapport with fellow-students who were my microteaching "pupils". Means: PV + PA = 4.2 (n=24) PV= 4.2 PA= 4.2	16.7 (5)	83.3			(1)
5.03	It was easy to plan discussion lessons for working with fellow-students as "pupils". Means: PV + PA = 3.3 (n=24) PV= 3.7 PA= 2.8	8.3 (5)	41.7	16.7	33.3	(1)
4.16	Some warm-up sessions using fellow-students as "pupils" would have been desirable before any analysis of my teaching occurred. Means: PV + PA = 3.5 (n=24) PV= 3.8 PA= 3.3	4.2 (1)	8.3	20.8	66.7	(5)
5.07	During microteaching sessions with fellow-students as "pupils", discipline was frequently a problem. Means: PV + PA = 4.3 (n=24) PV= 4.1 PA= 4.4	(1)	12.5	4.2	29.2	54.2 (5)

Table 8. 25(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (PV + PA treatments)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
5.09	It would have been preferable to teach children in microteaching sessions rather than fellow-students. Means: PV + PA = 3.2 (n=24) PV= 3.0 PA= 3.3	(1)	20.8	45.8	29.2	4.2 (5)
4.19	Freedom to use the resource materials provided or to choose one's own topic for discussion sessions, was an appropriate approach. Means: PV + PA = 4.5 (n=24) PV= 4.3 PA= 4.6	45.8 (5)	54.2			(1)
3A.05	The responses of fellow-students as my "pupils" were so good that I was often prevented from using sustaining moves such as redirecting, probing, probe-redirecting, and using pupil ideas. Means: PV + PA = 2.8 (n=24) PV= 2.8 PA= 2.8	16.7 (1)	33.3	8.3	37.5	4.2 (5)
3A.06	Positive reinforcement is a somewhat inappropriate skill to use when teaching fellow-students. Means: PV + PA = 2.4 (n=24) PV= 2.8 PA= 2.0	16.7 (1)	45.8	16.7	20.8	(5)

Table 8.26 Opinions concerning the use of videotapes for analysis and feedback activities in the micro-teaching format.

CV = children-video treatment group
PV = peers-video treatment group

CODE	ITEMS	PER CENTAGE RESPONSES (CV + PV treatments) STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3D.30	The video-tape playback of my teaching added significantly to the value of feedback sessions. Means: CV + PV = 4.7 (n=24) CV= 4.8 PV= 4.6	70.8 (5)	29.2			(1)
2.08	The presence of video and sound equipment was distracting and inhibited my micro-teaching. Means: CV + PV = 4.1 (n=24) CV= 4.0 PV= 4.2	4.2 (1)		8.3	58.3	29.2 (5)
2.10	When being a "pupil", I found that the presence of video and sound equipment distracted me and hindered my responses. Means: CV + PV = 4.1 (n=24) CV= 3.9 PV= 4.3	(1)		16.7	58.3	25.0 (5)
3D.31	Viewing video-tape playbacks of my teaching was an uncomfortable experience. Means: CV + PV = 4.2 (n=24) CV= 4.2 PV= 4.2	(1)		12.5	58.3	29.2 (5)
3C.09	The video-tape-recordings of the samples of teaching used in Session No. 1 of each laboratory were well filmed presentations. Means: CV + PV = 3.8 (n=24) CV= 4.3 PV= 3.4	12.5 (5)	62.5	20.8	4.2	(1)
3C.11	The cues provided at the bottom of the screen helped me identify skills being used in the teaching sample provided in Session No. 1 of each laboratory. Means: CV + PV = 4.4 (n=24) CV= 4.5 PV= 4.3	41.7 (5)	58.3			(1)
3D.33	The effectiveness of video-tape playbacks of my teaching was reduced because facilities during replay were not favourable. Means: CV + PV = 4.2 (n-24) CV= 4.2 PV= 4.3	(1)	4.2	4.2	58.3	33.3 (5)
3D.36	The images of myself and the teaching group on the video screen during playbacks were too small to be helpful. Means: CV + PV = 4.4 (n=24) CV= 4.5 PV= 4.3	(1)	4.2	4.2	37.5	54.2 (5)

Table 8.28 (contd.)

CODE	ITEMS	PER CENTAGE RESPONSES (CV + PV treatments)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3D.35	I would have preferred an audio-tape playback of my teaching rather than a video-tape playback. Means: Cv + PV = 4.5 (n=24) CV= 4.5 PV= 4.4	(1)			54.2	45.8 (5)
3D.37	The presence of the video image in playbacks of my teaching made it difficult for me to concentrate on the verbal interaction. Means: CV + PV = 3.8 (n=24) CV= 4.2 PV= 3.5	(1)	12.5	20.8	37.5	29.2 (5)
3D.38	When making frequency counts of skills or coding with SCAIES, I listened to the sound track more than I watched the video images on the screen. Means: CV + PV = 2.6 (n=24) CV= 2.3 PV= 3.0	4.2 (1)	58.3	12.5	20.8	4.2 (5)

Table 8.27 Opinions concerning the use of audiotapes for analysis and feedback activities in the micro-teaching format.

CA = children-audio treatment group
PA = peers-audio treatment group

CODE	ITEMS	PER CENTAGE RESPONSES (CA + PA treatments)				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3D.32	The effectiveness of audio-tape playbacks of my teaching was reduced because facilities during replay were not favourable. Means: CA + PA = 3.8 (n=24) CA= 3.6 PA= 4.1	(1)	8.3	16.7	58.3	16.7 (5)
3C.10	The special cueing-box (lights and labels) helped me identify skills being used in the teaching sample provided in Session No. 1 of each laboratory. Means: CA + PA = 3.7 (n=24) CA= 3.8 PA= 3.6	12.5 (5)	58.3	16.7	12.5	(1)
3D.34	I would have preferred a video-tape (television) playback of my teaching rather than an audio-tape playback. Means: CA + PA = 3.6 (n=24) CA= 3.3 PA= 3.9	4.2 (1)	12.5	29.2	29.2	25.0 (5)
3D.29	The audio-tape playback of my teaching added significantly to the value of feed-back sessions. Means: CA + PA = 4.3 (n=24) CA = 4.3 PA = 4.3	37.5 (5)	54.2	4.2	4.2	(1)
2.06	The presence of a tape-recorder was distracting and inhibited my microteaching. Means: CA + PA = 4.0 (n=24) CA = 3.9 PA= 4.2	4.2 (1)	4.2	4.2	58.3	29.2 (5)
2.09	I found that the presence of a tape-recorder was distracting to my pupils. Means: CA + PA = 4.1 (n=24) CA= 3.9 PA= 4.3	(1)	4.2	4.2	66.7	25.0 (5)
3D.30	Hearing audio-tape playbacks of my teaching was an uncomfortable experience. Means: CA + PA = 3.9 (n=24) CA= 3.7 PA= 4.2	(1)	16.7		58.3	25.0 (5)
3C.08	The audio-tape-recordings of the samples of teaching used in Session No. 1 of each laboratory were sufficiently clear. Means: CA + PA = 3.2 (n=24) CA= 2.7 PA= 3.7	8.3 (5)	45.8	12.5	20.8	12.5 (1)

TABLE 8.28 Main qualities of an Effective Microteaching Supervisor: Representative Qualities Identified by Microteaching Participants.

CV = Microteaching children-video treatment group (n=12)
CA = Microteaching children-audio treatment group (n=12)
PV = Microteaching peers-video treatment group (n=12)
PA = Microteaching peers-audio treatment group (n=12)

Representative qualities	No. times mentioned				
	Treatment groups				
	CV	CA	PV	PA	Total
1. Friendly, relaxed, informal, warm, sincere, concerned, understanding, encouraging, genuine interest in the student, helpful considerate.	10	3	7	4	24
2. Does not judge or tell, but is objective, impartial, and non-critical.	4	7	7	4	22
3. Guides rather than dominates the group. Encourages students to work out their own solutions and to self-evaluate.	5		4	5	14
4. Is a good listener, is receptive to others' ideas and shows willingness to talk with students as equals.	5	3	2	3	13
5. Has full understanding of, and ability to handle the teaching skills involved. Is experienced, has wide knowledge and interests.	5	4	2	2	13
6. Is a good communicator. Has experience as a group leader in binding a group as a cohesive unit.	3	3	5	1	12
7. Has a sense of humour.	5	1	1	1	8
8. Has enthusiasm for the objectives and "sells" the skills.	2	1		3	6
9. Has patience, especially when theory and practice become difficult.	5	1			6
10. Is well-organised but flexible.	1	2		2	5
11. Is sensitive to others' problems.			1	2	3
12. Creates an atmosphere which fosters interest and enthusiasm.		1			1

TABLE 8.29. First, Second and Third Order of Felt Difficulty for Teaching Skills as Expressed by Microteachers (weighted scores of 3, 2 and 1 for first, second and third order respectively).

Teaching Skills	Microteaching Treatment Groups												All Microteachers n = 48			
	Video-Children n = 12				Video-Peers n = 12				Audio-Children n = 12				Audio-Peers n = 12							
	No. stating diffic. order			Total Wtd. Sc.	No. stating diffic. order			Total Wtd. Sc.	No. stating diffic. order			Total Wtd. Sc.	No. stating diffic. order			Total Wtd. Sc.	No. stating diffic. order			Total Wtd. Sc.
	1st	2nd	3rd		1st	2nd	3rd		1st	2nd	3rd		1st	2nd	3rd		1st	2nd	3rd	
Probing questions	1	3		9	2	1		8	1	2	1	8	5	1		17	9	7	1	42
Discriminating level of initial questions	3			9	1			3	1		1	4	1			3	6		1	19
SQUAIES coding	2	1		8	1	2		7	2	1		8	2		2	8	7	4	2	31
Using wait time		1	1	3				0	1			3	1	2		7	2	3	1	13
Avoiding repetition pupil resps.		1		2				0	1			3				0	1	1		5
Using pupil ideas			1	1	3			9	1		1	4				0	4		2	14
Calling upon volunteers and non-volunteers		1		2				0	1			3			1	1	1	1	1	6
Redirecting questions				0				0				0	1			3	1			3
Redirecting probing questions			1	1				0				0	1			3	1		1	4
Praising pupils				0			1	1				0		1	1	3		1	2	4
Long-riding episodes				0				0				0			1	1			1	1
Thinking out topic for questioning skills				0				0				0			1	1			1	1
Using middle order questions	1			3	1	1		5		1		2	1	1	1	6	3	3	1	16
Using high order questions	4			12	3	2		13	1	2		7	2	1	1	9	10	5	1	41
Giving objective feedback to fellow microteachers				0				0		1		2				0			1	2
Use of correction skills				0			1	1				0				0			1	1
Responses made	21				19				19				28				87			
Possible responses	36(12 × 3)				36(12 × 3)				36(12 × 3)				36(12 × 3)				144(48 × 3)			
Per cent responding	58.3				52.8				52.8				77.8				60.4			

TABLE 8.30 Summary of Order of Felt Difficulty for Teaching Skills Expressed by Microteachers.[1]

Felt difficulty order for teaching skills	Microteaching Treatment Groups				All microteachers n = 48
	Video-children n = 12	Video-peers n = 12	Audio-children n = 12	Audio-peers n = 12	
1st	Using high order initial questions (12)	Using high order initial questions (13)	Probing questions (8) SQUAIES coding (8)	Probing questions (17)	Probing questions (42)
2nd	Probing questions (9) Discriminating initial question levels (9)	Using pupil ideas (9)	Using high order initial questions (7)	Using high order initial questions (9)	Using high order initial questions (41)
3rd	SQUAIES coding (8)	Probing questions (8)	Discriminating initial question levels (4) Using pupil ideas (4)	SQUAIES coding (8)	SQUAIES coding (31)
4th	Using wait time (3) Using middle order initial questions (3)	SQUAIES coding (7)	Using wait time (3) Avoiding repetition pupil responses (3) Calling upon volunteers and non-volunteers (3)	Using wait time (7)	Discriminating initial question levels (19)
5th	Avoiding repetition pupil responses (2) Calling upon volunteers and non-volunteers (2)	Using middle order initial questions (5)	Using middle order initial questions (2)	Using middle order initial questions (6)	Using middle order initial questions (16)

1 Order in the table, top to bottom, is according to weighted scores of 3, 2 and 1 for expression of first, second and third order of felt difficulty respectively as shown in TABLE 8.20. Weighted scores are indicated in brackets.

TABLE 8.31 Major Impacts of the Microteaching Programme: Representative Statements by Microteachers.

CV = Microteaching children-video treatment group (n=12)
CA = Microteaching children-audio treatment group (n=12)
PV = Microteaching peers-video treatment group (n=12)
PA = Microteaching peers-audio treatment group (n=12)

Representative themes	No. times mentioned				
	Treatment Groups				
	CV	CA	PV	PA	Total
1. Improved knowledge and awareness of repertoire of discussion-leading skills (particularly questioning and reacting skills), resulting in greater competence and awareness of myself as a teacher.	6	19	9	13	47
2. Increased sensitivity to, and supportiveness of, pupils as individuals in a group. Attempting to allow all pupils to participate. Allowing pupil ideas to steer discussion rather than dominating it with teacher ideas. Improving and extending pupil ideas through questioning.	5	4	2		13
3. Understanding the complex factors involved in questioning as an effective technique.	3	2	3	4	12
4. Able to self-evaluate my teaching.	1	1	3	3	8
5. SQUAIES coding as feedback.				2	2
6. The laboratory on middle and high order questions.		1	1		2
7. Importance of planning discussion sessions.		1		1	2
8. Value of Bloom's Taxonomy for asking questions.	1		1		2
9. Pressure-free, non-judgmental environment in the microteaching group.				1	1
10. Able to better deal with, and work with, other people.				1	1
11. Microteaching experience shows the importance of others' ideas.				1	1
12. More able to provide objective feedback for other student teachers.		1			1
13. Reduction of "nerves" when being watched teaching.		1			1
14. Made more conscious of voice production.		1			1
15. Importance of accepting and praising pupil responses		1			1

TABLE 8.32 Suggested Improvements to the Microteaching Programme: Representative Statements by Microteachers.

CV = Microteaching children-video treatment group (n=12)
CA = Microteaching children-audio treatment group (n=12)
PV = Microteaching peers-video treatment group (n=12)
PA = Microteaching peers-audio treatment group (n=12)

Representative statements	No. times suggested				
	Treatment groups				
	CV	CA	PV	PA	Total
1. Extend course over two terms to afford more time on each laboratory and make more teaching and re-teaching opportunities available.	3	4	2	5	14
2. Longer time for feedback discussion sessions.	1		2	1	4
3. Longer time for each microteaching lesson.	1			1	2
4. More time should be given to learning to use the SQUAIES coding system.		1	1		2
5. Either two microteachers only in a one-and-a-half hour block, or use three one-hour blocks.		1	1		2
6. During feedback sessions, the supervisor should provide specific advice on improvements to be made in a student's teaching.		1		1	2
7. Spend more time on levels for initial questions.	1				1
8. Vary the patterns each microteaching session, e.g., opportunity to work with different sized groups.	1				1
9. Better filming facilities.	1				1
10. Opportunity for all microteachers to use both middle and high order questions.	1				1
11. Course should be compulsory for all students.			1		1
12. Occasionally go into the classroom and practise skills.		1			1
13. Build in an extension programme for those interested in delving deeper with the skills.				1	1
14. Provide suggested list of topics for discussion lessons.		1			1
15. Some help at first with planning of initial questions.		1			1

ITEMS ON GENERAL EFFECTIVENESS	
1A.01	Microteaching is an effective way of learning to use questioning and reacting skills.
1A.02	As a result of this course, my repertoire of questioning and reacting skills has increased.
1A.03	There is value in analysing teaching in terms of verbal skills.
1A.04	Microteaching lacks reality.
1A.05	I clearly understood the objectives of the course.
1A.06	It was possible in this course to learn a great deal from observing fellow students teach.
1A.07	During this course, I found myself analysing questioning and reacting skills that were being used in other college classes as well as during observation visits to schools.
1A.08	Microteaching and the skills approach in this course tended to "cramp my personal teaching style".
1A.09	Experience in this course enabled me to "pick up" skills additional to those included in the actual course objectives.
1A.10	Before this course, I was already confident and competent in using the skills upon which the course focused.
1A.11	The skills emphasised in this course were mostly new to me.
1A.12	My interest was maintained throughout the course.
3A.02	A "one skill at a time" approach (thus more teaching laboratories) would have been more desirable than the cluster of related skills approach.
ITEMS ON NEED FOR MICROTEACHING	
1B.14	Having a wide repertoire of questioning and reacting skills is important to a teacher.
1B.15	This microteaching course should be a required course for all students at some point in their three years at college.
1B.17	This microteaching course should be made available earlier than in the third year at college.
1B.18	I would be keen to participate in other microteaching courses on further sets of teaching skills.
1C.19	Microteaching should be built into all studies in teaching courses in college.
1C.20	It would be helpful on school section if visiting college lecturers used some kind of coding system to provide objective data about my teaching for discussion purposes.
ITEMS ON TRANSFER POTENTIAL OF MICROTEACHING	
1C.21	Skills emphasised in this course could be used across a wide range of curriculum areas.
1C.22	Skills emphasised in this course could be used with larger pupil groups or a whole class.
1C.23	I think I will be able to transfer knowledge and use of skills gained in this course to my classroom teaching.

FIG. 8.2. The 22 Opinion Statements from Part 1 of the Opinion Questionnaire Selected for Factor Analysis Purposes.

TABLE 8.33 Principal components analysis of attitudes towards the general effectiveness of microteaching by microteachers (N = 48), with factor loadings ⩾ 0.4 shown.

Questionnaire item	FACTOR I	FACTOR II	FACTOR III	FACTOR IV	H^2
1C.15	.75	-.02	.17	.19	.63
1B.12	.64	.03	.16	-.00	.44
1C.19	.64	.21	-.12	.08	.48
1C.20	.58	.02	-.51	.01	.60
1A.05	.54	.16	.10	.01	.48
1A.03	.49	.42	.19	.18	.49
1B.14	.50	.20	.01	-.38	.43
1A.07	.47	.02	-.03	-.32	.32
1C.23	.46	.09	-.01	-.02	.22
1A.02	.30	.74	-.02	.00	.64
1A.01	.01	.70	.12	-.21	.55
1C.21	.24	.60	.34	.30	.62
1A.09	.27	.56	.15	-.30	.50
3A.02	-.11	.54	-.25	.15	.39
1A.08	.32	.48	.27	.38	.41
1A.06	.22	.43	.22	.02	.28
1A.04	.27	.14	.74	-.11	.65
1C.22	.11	.06	.68	-.02	.48
1C.18	.24	.36	-.53	.13	.49
1A.10	-.02	.06	.01	.73	.54
1A.11	.01	.03	-.18	.58	.37
1C.17	.15	-.41	-.02	.44	.37
% total variation	21.5	9.2	8.5	7.9	47.18
% common variation	45.6	19.5	18.0	16.7	
Eigenvalues	4.7	2.0	1.9	1.8	

The four factors account for 47.1 per cent of the total variation.

Principal axes technique. Squared multiple correlation coefficients were inserted in the main diagonal of the correlation matrix as communality estimates, and only common factors with eigenvalues ⩾ 0.4 were extracted.

FACTOR I Value of microteaching
FACTOR II Effectiveness of microteaching
FACTOR III Reality of microteaching experience
FACTOR IV Familiarity with the teaching skills

TABLE 8.34 Multivariate analysis of variance[1] on attitudes towards the value , effectiveness, reality and skills of the microteaching programme as expressed by microteachers (N = 48) experiencing different combinations of pupils taught (c = children, p = peers) and media (v = videotape, a = audiotape).

Source	Log (generalised variance)	U-statistic	df	Approx. F stat.	df	Signif. Level
P	15.33228	.927355	4 1 44	.8029	4 41	n.s.
M	15.30802	.950125	4 1 44	.5381	4 41	n.s.
P × M	15.27775	.979321	4 1 44	.2164	4 41	n.s.
R(P × M)	15.25686					

1 Computer programme BMD12V

Table 8.35 Opinions concerning the general effectiveness of the observation-analysis programme.

CODE	ITEMS	PERCENTAGE RESPONSES				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1C.23	I think I will be able to transfer knowledge and use of skills gained in this course to my classroom teaching.	50.0	41.7	8.3		
1A.03	There is value in analysing teaching in terms of verbal skills.	37.5	62.5			
1A.05	I clearly understood the objectives of the course.	4.2	75.0	12.5	4.2	4.2
1A.07	During this course, I found myself analysing questioning and reacting skills that were being used in other college classes as well as during observation visits to schools.	29.2	45.8	16.7	8.3	
1A.10	Before this course, I was already confident and competent in using the skills upon which the course focused.			16.7	58.3	25.0
1A.11	The skills emphasised in this course were mostly new to me.	12.5	54.2		33.3	
1B.12	My interest was maintained throughout the course.	25.0	37.5	12.5	20.8	4.2
1B.14	Having a wide repertoire of questioning and reacting skills is important to a teacher.	70.8	25.0	4.2		
1C.15	This study course should be a required course for all students at some point in their three years at college.	54.2	33.3	8.3	4.2	

Table 8.35(contd.)

CODE	ITEMS	PER CENTAGE RESPONSES				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1C.17	This study course should be made available earlier than in the third year at college.	25.0	58.3	8.3	8.3	
1C.18	I would be keen to participate in other study courses on further sets of teaching skills.	20.8	54.2	25.0		
1C.20	It would be helpful on school section if visiting college lecturers used some kind of coding system to provide objective data about my teaching for discussion purposes.	8.3	58.3	29.2	4.2	
1C.21	Skills emphasised in this course could be used across a wide range of curriculum areas.	54.2	45.8			
3A.02	A "one skill at a time" approach (thus more teaching laboratories) would have been more desirable than the cluster of related skills approach.		16.7	29.2	45.8	8.3
3A.03	The sequencing of the skills clusters, laboratory to laboratory, enabled me to build up my understanding of questioning and reacting skills in a gradual and meaningful way.	12.5	66.7	16.7	4.2	
3A.04	Starting with closed and open initial questions was a good "lead-up" to low, middle and high order initial questions.	29.2	62.5	8.3		
3B.05	In the two sessions of each teaching laboratory, each of the components listed below made a valuable contribution to learning about the skills:					
	(a) Starting off the session with a review discussion of the skills.	20.8	58.3	20.8		
	(b) The cued sample of teaching demonstrating the skills.	16.7	66.7	16.7		
	(c) The transcript of the cued sample of teaching.	12.5	54.2	25.0	8.3	
	(d) The second non-cued sample of teaching for minute-by-minute analysis.	33.3	58.3	8.3		
	(e) Class work on the exercises related to the skills.	25.0	50.0	25.0		

Table 8.35(contd.)

CODE	ITEMS	PERCENTAGE RESPONSES				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3C.06	The teaching laboratory books were generally helpful to me in understanding the nature and purposes of the different skills.	54.2	45.8			
3C.07	The features of the laboratory books listed below were special strengths:					
	(a) Appearance, setting out, format.	33.3	58.3	8.3		
	(b) Clearly stated objectives.	25.0	45.8	25.0	4.2	
	(c) Clear description of the skills.	41.7	58.3			
	(d) Appropriate use of diagrams.	25.0	58.3	16.7		
	(e) Technical language at a reasonable level.	25.0	70.8			
3D.12	The SQAIES coding system provides useful information about teaching.	50.0	33.3	16.7		
3D.13	The SQAIES coding system is easy to learn to use.	29.2	41.7	20.8	4.2	4.2
3D.14	The SQAIES coding system was introduced at an appropriate point in the course.	20.8	50.0	25.0	4.2	
3D.15	Data derived from the SQAIES coding system is more useful than data from frequency counting of skills.	25.0	45.8	25.0	4.2	
4.02	One term with a 1-hour session per week was an appropriate schedule for achieving the course objectives.	8.3	37.5	16.7	29.2	8.3
4.12	More skills should have been included in the course.		12.5	12.5	70.8	4.2
4.13	Work pressures related to other college courses often kept me from devoting as much time to study of my laboratory books as I would have liked to have done.	25.0	50.0	8.3	16.7	

Table 8.36 Opinions concerning the general effectiveness of the observation-analysis programme - videotape treatment group.

CODE	ITEMS	PER CENTAGE RESPONSES				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3C.09	The video-tape-recordings of the samples of teaching used in each laboratory were well filmed presentations.	8.3	58.3	8.3	16.7	8.3
3C.11	The cues provided at the bottom of the screen helped me identify skills being used in the teaching sample provided in Session No. 1 of each laboratory.	16.7	58.3	25.0		
3D.38	When making frequency counts of skills or coding with SQAIES, I listened to the sound track more than I watched the video images on the screen.	25.0	50.0	25.0		

Table 8.37 Opinions concerning the general effectiveness of the observation-analysis programme - audiotape treatment group.

CODE	Indicate your level of agreement or disagreement with each of the following statements by placing a tick (✓) in the appropriate box:	PER CENTAGE RESPONSES				
		STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
3C.08	The audio-tape-recordings of the samples of teaching used in each laboratory were sufficiently clear.	8.3	58.3	25.0	8.3	
3C.10	The special cueing-box (lights and labels) helped me identify skills being used in the teaching sample provided in Session No. 1 of each laboratory.	25.0	16.7	41.7	8.3	8.3

TABLE 8.38 First, Second and Third Order of Felt Difficulty for Teaching Skills as Expressed by Observation-analysis Participants (weighted scores of 3, 2 and 1 for first, second and third order respectively).

Teaching skills	Observation-analysis Treatment Groups				All observation-analysis participants			
	Video n = 12		Audio n = 12		n = 24			
	No. stating diffic. order 1st	2nd	3rd	Total Wtd. Sc	No. stating diffic. order 1st	2nd	3rd	Total Wtd. Sc.	No. stating diffic. order 1st	2nd	3rd	Total Wtd. Sc.
Discriminating level of initial questions	4			12	3			9	7			21
Probing questions			1	1		2		4		2	1	5
Redirecting questions		1		2	2			6	2	1		8
Redirecting probing questions		1		2		1		2		2		4
Discriminating different kinds of high order initial questions	1			3	1			3	2			6
Structuring with questions				0			1	1			1	1
SQUAIES coding	5			15	2			6	7			21
Discriminating middle and high order initial questions				0	2			6	2			6
Responses made	13				14				27			
Possible responses (12 × 3)	36(12 × 3)				36(12 × 3)				72(24 × 3)			
Per cent responding	36.1				38.9				37.5			

TABLE 8.39 Summary of Order of Felt Difficulty for Teaching Skills Expressed by Observation-analysis Participants [1]

Felt difficulty order for teaching skills	Observation-analysis Treatment Groups		All observation-analysis participants
	Video n = 12	Audio n = 12	n = 24
1st	SQUAIES coding (15)	Discriminating initial question levels (9)	SQUAIES coding (21) Discriminating initial question levels (21)
2nd	Discriminating initial question levels (12)	Redirecting questions (6) SQUAIES coding (6) Discriminating middle and high order initial questions (6)	Redirecting questions (8)
3rd	Discriminating different kinds of high order initial questions (3)	Probing questions (4)	Discriminating different kinds of high order initial questions (6)
4th	Redirecting questions (2) Redirecting probing questions (2)	Discriminating different kinds of high order initial questions (3)	Probing questions (5)
5th	Probing questions (1)	Redirecting probing questions (2)	Redirecting probing questions (4)

1 Order in the table, top to bottom, is according to weighted scores of 3, 2 and 1 for expression of first, second and third order of felt difficulty respectively as shown in TABLE 8.38. Weighted scores are indicated in brackets.

TABLE 8.40 Major Impacts of the Observation-analysis Programme: Representative Statements by Participants.

V = Observation-analysis with video treatment group (n=12)
A = Observation-analysis with audio treatment group (n=12)

Representative themes	No. times mentioned		
	Treatment Groups V	A	Total
1. Greater awareness of the variety and importance of questioning skills for leading discussion to stimulate pupil participation and thinking.	9	9	18
2. Use of wait time.	2	1	3
3. Feel will be more confident in guiding discussion.		2	2
4. Importance of mixing short and long-riding episodes according to teaching objectives.		2	2
5. Recognising different question levels (Bloom's Taxonomy).	2		2
6. Use of positive reinforcement.	1		1
7. Pitfalls when using questions.	1		1
8. Usefulness of the SQUAIES system for analysing discussion.		1	1
9. Seeing how children react when skilful questioning is used.		1	1
10. Am now a better observer of teaching and probably will be a better questioner.		1	1

TABLE 8.41 Suggested Improvements to the Observation-analysis Programme: Representative statements by Participants.

V = Observation-analysis with video treatment group (n=12)
A = Observation-analysis with audio treatment group (n=12)

Representative statements	No. times mentioned		
	Treatment Groups V	A	Total
1. Include practical experience with children (or even peers) for coding sessions and self-correction.	9	4	13
2. Increase the time for the course as much as possible.	6	4	10
3. Include some live coding in a classroom and have discussion afterwards with the teacher.	1	2	3
4. Make the course compulsory for all Year 1 and Year 2 students.	1	1	3
5. More coding experience (with or without cues).	2		2
6. Spend more time on Bloom's Taxonomy.	1		1
7. Issue the complete set of laboratory books at the beginning.		1	1
8. No changes are needed.		1	1

TABLE 9.1 Post to Post-test Performance of Microteachers in the Children-Video Treatment Group.[1]

Dependent Variables	Post-test Mean	Post Post-test Mean	Mean Diff.	s.d.	t	2-Tail Prob.
CONTROL FUNCTIONS OF TEACHER QUESTIONS:						
1. Fluency-control.	.86	.87	+ .01	.07	.50	n.s.
2. Cognitive episode control.	8.17	6.50	-1.67	4.34	1.34	n.s.
3. Episode sustaining tendency.	3.54	3.94	+ .40	3.73	.36	n.s.
4. Redirection tendency.	.07	.07	.00	.08	.15	n.s.
5. Probing tendency.	.53	.52	- .01	.16	.20	n.s.
6. Use of pupil ideas.	.03	.00	- .03	.03	3.00	.02
7. Structuring with questions.	.16	.08	- .08	.06	4.00	.01
LOGICAL FUNCTIONS OF TEACHER QUESTIONS:						
8. Low order initial questions.	.13	.17	+ .04	.25	.57	n.s.
9. Middle order initial questions.	.28	.36	+ .08	.26	1.00	n.s.
10. High order initial questions.	.58	.46	- .12	.30	1.33	n.s.
11. High order probing.	.52	.58	+ .06	.24	.86	n.s.
TEACHER-PUPIL TALK PATTERNS:						
12. Amount of teacher talk.	NOT ASSESSED					
13. Repeating pupil responses.	.02	.03	+ .01	.05	1.00	n.s.
14. Yes/no questions.	.19	.15	- .04	.09	1.33	n.s.
15. Teacher answering own questions.	.00	.00	.00	.00	.00	n.s.
16. One idea pupil responses.	.44	.56	+ .12	.17	2.40	.05
17. Several ideas pupil responses.	.40	.33	- .07	.12	1.75	n.s.
18. Extended ideas pupil responses.	.16	.11	- .05	.16	1.00	n.s.
19. Coordinate-reactive responses.	.56	.53	- .03	.19	.60	n.s.

1 N = 12, df = 11.

APPENDIX A

PRE-TESTING AND POST-TESTING

A.1 Pre-test Briefing Notes

PRETEST BRIEFING NOTES

All groups: A, B and C

Year 2 School Section

1. Explain the purpose of the briefing session (standardised approach):

   a. " As a result of the random draw of names procedure which was explained to you all earlier this term, you people have now become prospective members for the course on teaching skills which is to be conducted next year. As you know, you have all been divided into three groups for taking this course on different timetabling arrangements so that the lecturers working in the course can handle the number of students involved. Before the lecturers and I plan this course in detail we feel it important to have a clear idea of just what your learning needs are. This way, we can be more certain that your learning experiences will mean the most to you.

   b. With this idea in mind, we would like to visit each of you during your forthcoming Year 2 school section in order to make an audiotape of you leading a 10 minute discussion with a small group of 5 pupils. We want to treat this visit as a "diagnostic session". In other words, if we can analyse what your learning needs are as a group, then we can design course activities for you that will be genuinely worth pursuing.

   c. The visit for audiotaping purposes has nothing to do with visits you will have on school section from other college lecturers, and it has nothing to do with any teaching practice reports made on you for college purposes. In fact, no one will have access to any audiotapes made except Mr. Hill and myself.

   d. Shortly you will receive a kit in which the details for the visit are provided. You will note that this kit contains a copy of a story entitled The Day the Bears Go to Bed. This story will be the stimulus material for your discussion session with your group of pupils.

   e. When you receive your kit please write your name, T-group and H.T.C. on the outside and on each item inside."

2. Distribute the kits:

   a. Remind the students about Item 1e above.

   b. Allow sufficient time for student perusal of the kit items.

3. Discuss the Directions Sheet (standardised approach):

   a. " The directions given you in the box at the top explain your task." (Read aloud to the group).

   b. (Read aloud the points on planning in the second box).

   c. Re: Special organisational points:

      No.2 " As pointed out here, it will be necessary for a few of you to use middle school pupils on what we might call " an adopted basis ". That is, you might be posted to a junior school class and the Principal will have to make special arrangements for you to select a group of 5 pupils from S.3, S.3/4 or S.4 for your audio-taping session. Furthermore, the Principal will be asked to give you ample opportunity for informal familiarisation sessions with these "adopted pupils" prior to the date of our visit.

No.4 " Visiting schedules for visits by other college lecturers will be posted before the end of this week on the noticeboard. Before you leave college this week, it is essential that you also check the Year 2 Noticeboard for the visiting schedule related to your audiotaping session with 5 pupils. A letter to your Principal will be forwarded this week indicating all details about the audiotaping session, especially on how to help you select 5 pupils who are average to above average in language ability, emotionally stable, and who are reasonably fluent orally."

4. Visits:

" The audiotaping visit to you in your school will be made by myself or Mr. Hill, depending upon the number of students in your school who are involved."

" Mr. Hill and I look forward to being with you on school section. "

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A.2 Pre-test Directions

HAMILTON TEACHERS COLLEGE TEACHING SKILLS COURSE, 1974

Diagnostic Discussion
Session
Term 3, 1973

DIRECTIONS FOR COURSE MEMBERS

Your Discussion Session

Through the use of a variety of questions you are to stimulate discussion with a group of 5 pupils for a period of 10 minutes on the story entitled The Day the Bears Go to Bed. While it will be appropriate at certain points in the discussion to use memory-recall questions, most of your attention should be directed towards getting the pupils thinking about the content of the story e.g., understanding, interpreting, reasoning, analysing, reacting, judging and problem solving.

Planning

1. Plan your discussion session on paper in the way that suits you best. Remember, however, that the discussion should be kept to verbal interaction only — that is, you should not make use of any teaching aids such as the blackboard, pictures, charts, or any special apparatus.

2. As discussed with you at college, it is extremely important that your discussion plan is done independently. Please do not seek any guidance from your Associate Teacher, fellow students or college staff. In addition, when your discussion session is over, please do not discuss it with anyone other than the visiting lecturer (Mr. Hill or Mr. Katterns).

SPECIAL ORGANISATIONAL POINTS

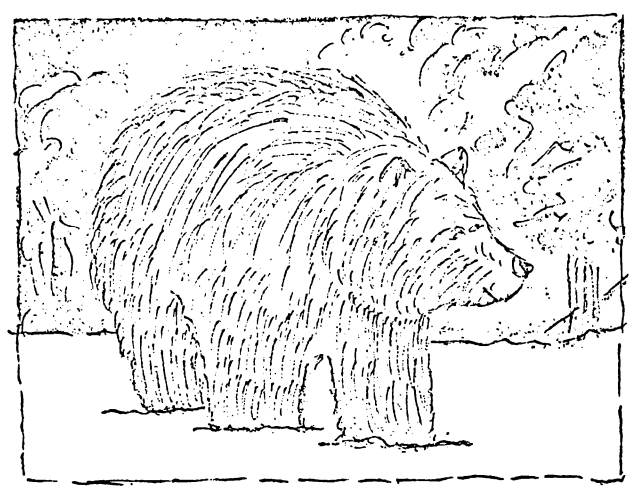
1. The discussion session will involve 30 minutes altogether: 5 minutes for getting the pupils settled and comfortable, 15 minutes for pupil reading of the story, and 10 minutes for the actual discussion. Sufficient copies of the story for your 5 pupils will be brought to the school by the visiting lecturer (Mr. Hill or Mr. Katterns).

2. Apart from a few students posted to intermediate schools, the pupil group will consist of S.3, S.3/4 or S.4 pupils. Your Principal and Associate Teacher have been requested to help you select a suitable group of pupils. Where a course member is posted to a junior school class (New Entrants to S.2) the Principal has been requested to allow some special opportunities to have informal interaction with a selected group of S.3, S.3/4 or S.4 pupils prior to the day of the observation visit. Such opportunities will give students posted to junior school classes a chance to get to know their discussion group pupils.

3. Either Mr. Hill or Mr. Katterns will be visiting course members to tape record the 10 minute discussion session. Your Principal has been requested to help in this activity by providing a fairly quiet place in the school. Where several students in one school are being visited within a given time period, the students concerned should negotiate the matter of order with the Principal and Associate Teachers to ensure that as little disruption as possible occurs to any other teaching tasks or responsibilities that they might have planned for that period.

4. VISITING SCHEDULE: A copy of the visiting schedule is being posted to each Principal. A copy is also posted on the Year 2 noticeboard. PLEASE CHECK THE MASTER SCHEDULE CAREFULLY FOR THE DATE OF YOUR VISIT.

The Day the Bears Go to Bed



The Day the Bears Go to Bed

Jean George

The big bear jogged swiftly through a forest in Yellowstone Park. It was November 5, 1963. Snow was blowing around the bear by the time she got to her den under a fir tree.

Tracker's radio receiver picks up beeps sent by the transmitter

For a moment she paused, then pushed her head beneath the fir roots and shuffled in. She sank down on a bed of branches she had gathered days before, and fitted her back into the earth she had rounded out. Then she rolled her nose into her belly and covered her head with her big paws.

Now relaxed, the big bear growled softly. She began to pass into a deep sleep that would cool her whole body and slow down her heartbeat and breathing. In this sleep, called hibernation, she would be able to live through Yellowstone's cold and foodless winter.

Broadcasting Bear

If you had seen this wild bear jogging through the forest, one thing would have amazed you. She wore a yellow plastic collar!

Fastened to the collar was a small radio transmitter. Day and night, unknown to the bear, the transmitter was sending out small beeps. While she jogged along, the beeps had been strong and jerky. Now that she was asleep, they had become weak and regular.

Meanwhile, two scientists

had been trailing the bear at a distance. As the beeps grew weaker, Dr. Frank Craighead turned to his brother John and smiled. "She's in," he said. "The old girl's gone to bed!"

Dr. Craighead had not seen her enter her den. Then how could he know she had finally gone into hibernation?

The radio receiver he used was picking up the weak, regular beeps of her transmitter. Dr. Frank and his brother felt rewarded for their five years of hard work. For the first time, a grizzly bear had been tracked into its winter den by radio.

Trapping and Tagging

Many years before, the two brothers had decided to work together to preserve the world of wild nature for man to enjoy. When they learned that grizzly bears were about to disappear from the West, they wanted to try to save them.

The first step in preserving an animal is to find out how it lives. The Craigheads were among the first to use radio transmitters for gathering facts about an animal.

"The bears," Dr. Frank said, "wander far and are most active at night. We could not follow or continually observe them without radio."

But first the huge bears had to be trapped. And it is not easy to fool a grizzly bear into entering a trap made of heavy steel pipes. However, the Craigheads managed to trap about 300 grizzlies for study.

The trapped bears had to be put to sleep so that they could be weighed, measured and color-tagged. Numbered plastic tags of different colors were snapped into each ear. These tags would identify the bears. Several bears were fitted with collars carrying radio transmitters. The transmitters beeped at different rates so that the bears could be tracked separately.

At Home on the Range

Let's watch the Craigheads as they work with one trapped bear. Frank has just put the animal to sleep by shooting a dart from a "sleepy gun." With four helpers, he lifts the bear from the trap and puts it into a net. The bear is lifted onto a scale. "Just a little one," Frank says. "It's only about 500 pounds."

Frank tags the bear as number 114. Then he measures its ears and the length of its body. He takes a sample of its blood. Meanwhile, a helper makes prints of its teeth and paws in soft plastic. The prints will be used to find out the bear's age.

Soon after Bear 114 is fitted with a radio-collar, he opens his eyes. He sits up, shakes his head and gets to his feet. Giving us a bored look, he hurries off.

We go with Frank to the nearby bear-tracking station in Canyon Village. A map for each bear hangs on the wall. As the men tune in on the bears, the animals' locations are marked on the maps. In time, each bear's home range will show on its map. Some have large ranges, 14 miles by four. Others need a range of only five miles by three.

The Big Mystery

By 1965, Frank and John Craighead knew many grizzly-bear secrets. The bears always make their dens on slopes where the snow does not melt during brief spells of warm weather. All the dens are dug by the bears themselves, under the roots of big trees. No den is ever used a second time. Fir or pine boughs are carried in the bears' teeth to line the dens. The boughs make soft beds for the cubs born in December.

The grizzlies prepare their dens many weeks before their hibernation. Then at last they *all* go to bed on the *same* day. Yet each year it may be a different day. In 1961, for example, it was October 21; in 1965, it was November 11.

What tells the bears that the right day has come?

To find out, the Craigheads checked past weather reports, discovering that each day on which the bears went to bed had been cold and snowy. Yet each year there had been some cold days and some snow *before* the day hibernation began.

During the years the Craigheads studied the bears, winter had come gradually to Yellowstone Park. When the snow had come at last, the bears had gone

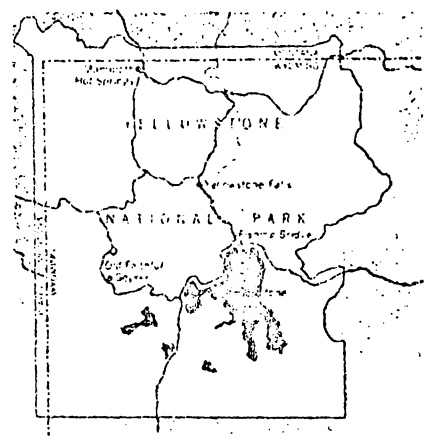
to bed. But in the autumn of 1965, the weather was unusual, changing back and forth from cold to warm. The changes gave the scientists an opportunity to watch for new clues to their mystery.

October 15, 1965, started as a warm, sunny day. Then it grew cloudy. In the morning, the brothers knew from the radio beeps that the bears were on the move at last. That afternoon, snow began to fall, quietly and straight down. The change in weather seemed to have rung the first bell, warning the bears to start toward bed. They had gone to their dens, but they had not gone inside.

Three days later, the sun came out again, melting the snow. After that, day after day, the brothers waited patiently. They tracked one mother bear and found her alone, sitting sleepily on a rock. They could see that she was having great trouble staying awake. Later they tracked her big son, Bear 202. He, too, was sleepy. He went in and out of his den — waiting for — what?

The Final Alarm Bell

On November 11, a windy snowstorm blew into Yellowstone. Dr. Frank heard very weak signals from Bear 202 and set out through the forest,



watching for bear tracks. But when the beeps showed that Bear 202 was very close by, no bear tracks were to be seen!

Then Dr. Frank felt sure about a guess he had already made. The bears had been waiting for a heavy, *drifting, blowing* snow that would cover their tracks and hide their dens.

By morning, the bears' radios were all giving the signals that meant hibernation. And there was not a grizzly-bear print in Yellowstone Park to show which way the bears had gone.

Gazing out at the white wilderness, Dr. Frank thought happily of the secret he and his brother had just learned about the bears. Yet he knew that finding *what* had sent them to bed did not really end the mystery. The strangest thing was still a secret — the "feel" of that first big winter storm to the bears. Perhaps that secret, buried in instinct, will be theirs forever!

A.4 Field Notes for Supervisors

DIRECTIONS FOR SUPERVISORS

Audiotaping of Pretest and Posttest Diagnostic Discussion Sessions

CHECKS TO BE MADE PRIOR TO EACH DAY'S SCHOOL VISITING

1. School Visiting Schedule:
   - a. Student names and identification numbers.
   - b. School locations - see map provided.

2. Audiotaping Kit:
   - a. 1 portable battery/electricity powered Sanyo tape recorder. Check working condition daily.
   - b. 1 electric power lead.
   - c. 5 batteries.
   - d. 1 stop watch
   - e. Sufficient audio cassettes for the number of students to be visited - two 10 minute sessions per side of a 60 minute audio cassette. Plus two spare cassettes.
   - f. 10 copies of pupil story - 5 to use and 5 spare.
   - g. Sufficient copies of record sheets for the number of students to be visited.
   - h. Pencil for labelling audio cassettes and completion of record sheets.

3. Visiting Record:

   Prior to each day's visiting, check the previous day's record sheets and audio cassettes to see that all are completed and filed safely.

PROCEDURE DURING AN AUDIOTAPING VISIT

1. Arrival:
   - a. At least 10 minutes before the time scheduled for the first student's session.
   - b. Introduce yourself to the Principal. Check the audiotaping schedule and location.

2. Audiotaping:
   - a. If the student teacher and pupils are not present at the audiotaping location, set up seats and recording gear.

Always use the electric power supply if possible (see the diagram at the end of these notes). If the student teacher and pupils are already present, introduce yourself and explain the purpose of the visit first, and then arrange the seating and audiotaping gear.

b. A standardised introductory procedure should be used for every taping session: Introduce yourself as being from the Hamilton Teachers College and indicate that you are asking teachers from the college and pupils in the Waikato to help you learn about how children react to stories you have chosen. Reassure the pupils that you are not a school inspector. Hold up the story booklet so that the cover is visible to all pupils and tell them that you have an interesting story for them to read after which the college teacher will have a discussion with them on it. Explain that the discussion will be tape-recorded so that you can enjoy listening to the discussion again. As you distribute the story indicate that 15 minutes reading time is available for silent reading of the story and that if anyone should finish sooner, he or she should read again any parts that were found to be especially interesting or enjoyable.

(3 - 5 MINUTES)

c. While the pupils are silent reading, establish rapport with the student teacher and enlist his or her aid in completing the following items:

Details on the record sheet.
Check audiotaping arrangements.
Set up your own seating position, preferably behind and to one side of the student teacher.
Record the student teacher's name and identification number on the outside of the audio cassette. Run the tape on a short distance ready for recording.
Conduct a trial recording.

Chat quietly and at a distance from the pupils: school section, current events etc. If the student teacher shows signs of preferring to look over the story or his or her discussion plan do not pursue conversation. When you observe that most pupils are nearing the end of their reading indicate to the student teacher to take the teacher's seat ready for recording. Assure the student teacher that you will turn on the recorder only when he or she gives you a signal of being ready to begin, and that he or she will know when 10 minutes is up by your turning off of the recorder although the discussion may still continue to round it off.

(10 - 15 MINUTES)

d. Record exactly 10 minutes making use of your stop watch. Should a student teacher complete the discussion before 10 minutes is up and clearly indicates this to you, accept this situation and make a record of the exact length of the session on your record sheet.

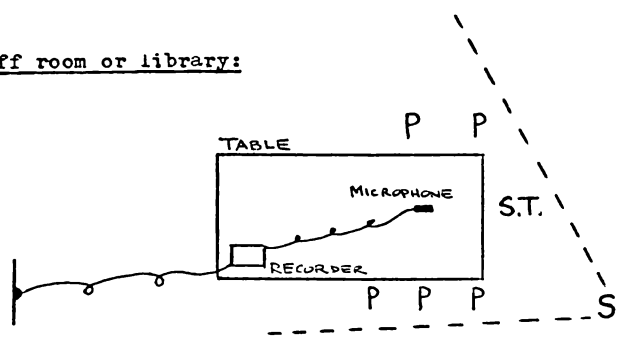
e. Before the pupils leave check that you do have a recording.

3. Departure:

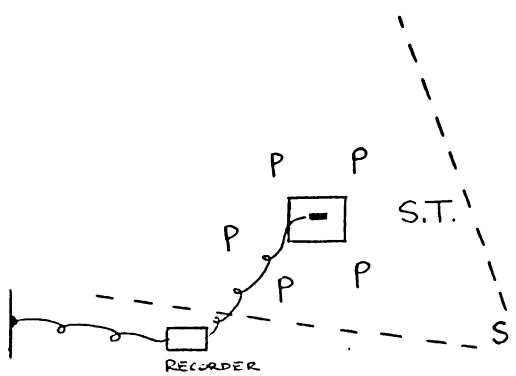
a. Ensure that you thank the Principal (and Associate Teacher if readily accessible). Inform the Principal if a revisit will be necessary because of a faulty recording.

AUDIOTAPING ARRANGEMENTS

In a staff room or library:



Other locations (chairs only):



MICROPHONE ON SMALL TABLE OR CHAIR

FIELD OBSERVATION NOTES

Diagnostic Discussion Session

1974 / 1975

Visiting Lecturer:

NO.

NAME:

SCHOOL:

CONTRIBG./ FULL PRIMARY / INTERMED.

DATE:

TIME:

POSTING:

GROUP DETAILS:

S.3 S.4 S.3/4

Other:

If junior school posting, what familiarisation opportunities with the teaching group ?

SESSION

Physical conditions:

Story reading:

Interaction:

General:

A.5 Post-test Briefing Notes

POSTTEST BRIEFING NOTES

Group A

Year 3 School Section

1. Explain the purpose of the briefing session (standardised approach):

   a. "Over this current term you have been participating in a course on teaching skills related to leading discussion lessons with small groups of pupils.

   b. During your Year 3 school section Mr. Mundell and I would like to follow up on your course by making an audiotape of you taking a 10 minute discussion with a small group of 5 pupils. The organisation for this audiotape recording is the same as last year and the teaching kits which I will distribute shortly provide you with full details. This time, however, you will use a different story.

   c. Please write your name, T-group and H.T.C. on the outside of your kit and on each item inside as soon as you get it. "

2. Distribute the kits:

   a. Remind the students about Item 1c above.

   b. Allow sufficient time for student perusal of the kit items.

3. Discuss the Directions Sheet (standardised approach):

   a. "The directions given you in the box at the top explain your task." (Read aloud to the group).

   b. (Read aloud the points on planning in the second box).

   c. Re: Special organisational points:

      No.2 "Some of you have been posted to junior school classes to meet the college requirement of coverage of the different school areas yet you asked to lead a discussion for taping purposes with 5 S.3, S.3/4 or S.4 pupils. This same situation occurred last year but it was found — as anticipated — that no difficulties were experienced by students in this situation who had a special middle school group allocated to them. As happened last year, the Principal of your school will make special arrangements for you to have informal familiarisation sessions with your "adopted pupils" prior to the visit by (Mr. Mundell) (Mr. Katterns). The visit to you is made quite independently of other college lecturers' visits, and it has nothing whatsoever to do with any teaching practice reports made on you in college. In fact, no one will have access to any audiotapes except Mr. Mundell and myself. "

      No.4 " Visiting schedules for visits by other college lecturers will be posted before the end of this week on the noticeboard. Before you leave college this week, it is essential that you also check the Year 3 Noticeboard for the visiting schedule related to your audio-taping session with 5 pupils. A letter to your Principal will be forwarded this week indicating all details about the audiotaping session, especially on how to help you select 5 pupils who are average to above average in language ability, emotionally stable, and who are reasonably fluent orally."

4. Visits:

   "The audiotaping visit to you in your school will be made by myself or Mr. Mundell, depending upon the number of students in your school who are involved."

   "Mr.Mundell and I look forward to being with you on school section."

- 0 -

POSTTEST BRIEFING NOTES

Group B

Year 3 School Section

1. Explain the purpose of the briefing session (standardised approach):

   a. " To date, you have been learning about various teaching skills related to leading discussion lessons with small groups of pupils.

   b. In Term 3, you will have further opportunities to continue this learning but by means of practising the skills under specially controlled conditions called microteaching. You will hear more about this when you return to college at the beginning of Term 3.

   c. In the meantime, while you are out on school section it is necessary to make an audiotape of each of you taking a 10 minute discussion with a small group of 5 pupils. This recording will be used to help plan the Term 3 course. Although you were taped similarly last year, an up-to-date recording is needed to identify your learning needs as they are now.

   d. The organisation for this audiotape recording is the same as last year and the teaching kits which I will distribute shortly provide you with full details. This time, however, you will use a different story.

   e. Please write your name, T-group and H.T.C. on the outside of your kit and on each item inside as soon as you get it. "

2. Distribute the kits:

   a. Remind the students about Item 1e above.

   b. Allow sufficient time for student perusal of the kit items.

3. Discuss the Directions Sheet (standardised approach) :

   a. " The directions given you in the box at the top explain your task." (Read out aloud to the group).

   b. (Read out aloud the points on planning in the second box).

   c. Re: Special organisational points:

      No.2 " Some of you have been posted to junior school classes to meet the college requirement of coverage of the different school areas yet you are asked to lead a discussion for taping purposes with 5 S.3, S.3/4 or S.4 pupils. This same situation occurred last year but it was found — as anticipated — that no difficulties were experienced by students in this situation who had a special middle school group allocated to them. As happened last year, the Principal of your school will make special arrangements for you to have informal familiarisation sessions with your " adopted pupils" prior to the visit by (Mr. Mundell) (Mr. Katterns). The visit to you is made quite independently of other college lecturers' visits, and it has nothing whatsoever to do with any teaching practice reports made on you in the college. In fact, no one will have access to any audiotapes made except Mr. Mundell and myself. "

      No.4 " Visiting schedules for visits by other college lecturers will be posted before the end of this week on the noticeboard. Before you leave college this week, it is essential that you also check the Year 3 Noticeboard for the visiting schedule related to your audio-taping session with 5 pupils. A letter to your Principal will be forwarded this week indicating all details about the audiotaping session, especially on how to help you select 5 pupils who are average to above average in language ability, emotionally stable,

and who are reasonably fluent orally."

4. Visits:

"The audiotaping visit to you in your school will be made by myself or Mr. Mundell, depending upon the number of students in your school who are involved. "

5. Term 3 Course:

"At the beginning of Term 3, notices will be posted on the Year 3 Noticeboard about your teaching skills course continuation."

"Mr. Mundell and I look forward to being with you on school section."

- 0 -

POSTTEST BRIEFING NOTES

Group C

Year 3 School Section

1. Explain the purpose of the briefing session (standardised approach):

   a. " You will remember that during Term 3 this year you will have your opportunity to participate in a course on teaching skills which has already been taken by other Year 3 students under a different timetabling arrangement. Related to the planning of your course, it is necessary to make an audiotape of each of you taking a 10 minute discussion with a group of 5 pupils during your Year 3 school section. Although you were taped similarly last year, an up-to-date recording is needed to identify your learning needs as they are now, to plan your course appropriately.

   b. The organisation for this audiotape recording is the same as last year and the teaching kits which I will distribute shortly provide you with full details. This time, however, you will use a different story.

   c. Please write your name, T-group and H.T.C. on the outside of your kit and on each item inside as soon as you get it. "

2. Distribute the kits:

   a. Remind the students about Item 1c above.

   b. Allow sufficient time for student perusal of the kit items.

3. Discuss the Directions Sheet (standardised approach):

   a. "The directions given you in the box at the top explain your task." (Read aloud to the group).

   b. (Read aloud the points on planning in the second box).

   c. Re: Special organisational points:

      No.2 " Some of you have been posted to junior school classes to meet the college requirement of coverage of the different school areas yet you are asked to lead a discussion for taping purposes with 5 S.3, S.3/4 or S.4 pupils. This same situation occurred last year but it was found — as anticipated — that no difficulties were experienced by students in this situation who had a special middle school group allocated to them. As happened last year, the Principal of your school will make special arrangements for you to have informal familiarisation sessions with your " adopted pupils" prior to the visit by (Mr. Mundell) (Mr. Katterns). The visit to you is made quite independently of other college lecturers' visits and it has nothing whatsoever to do with any teaching practice reports made on you in college. In fact, no one will have access to any audiotapes made except Mr. Mundell and myself."

      No.4 "Visiting schedules for visits by other college lecturers will be posted before the end of this week on the noticeboard. Before you leave college this week, it is essential that you also check the Year 3 Noticeboard for the visiting schedule related to your audiotaping session with 5 pupils. A letter to your Principal will be forwarded this week indicating all details about the audiotaping session, especially on how to help you select 5 pupils who are average to above average in language ability, emotionally stable, and who are reasonably fluent orally."

4. Visits:

" The audiotaping visit to you in your school will be made by myself or Mr. Mundell, depending upon the number of students in your school who are involved."

5. Term 3 Course:

" At the beginning of Term 3, notices will be posted on the Year 3 Noticeboard about your teaching skills course."

"Mr. Mundell and I look forward to being with you on school section."

- o -

A.6 Post-test Directions

HAMILTON TEACHERS COLLEGE TEACHING SKILLS COURSE, 1974

Diagnostic Discussion

Session

Term 2, 1974

DIRECTIONS FOR COURSE MEMBERS

Your Discussion Session

Through the use of a variety of questions you are to stimulate discussion with a group of 5 pupils for a period of 10 minutes on the story entitled Are You There Nessie ?. While it will be appropriate at certain points in the discussion to use memory-recall questions, most of your attention should be directed towards getting the pupils thinking about the content of the story e.g., understanding, interpreting, reasoning, analysing, reacting, judging and problem solving.

Planning

1. Plan your discussion session on paper in the way that suits you best. Remember, however, that the discussion should be kept to verbal interaction only — that is, you should not make use of any teaching aids such as the blackboard, pictures, charts, or any special apparatus.

2. As discussed with you at college, it is extremely important that your discussion plan is done independently. Please do not seek any guidance from your Associate Teacher, fellow students or college staff. In addition, when your discussion session is over, please do not discuss it with anyone other than the visiting lecturer (Mr. Mundell or Mr. Katterns).

SPECIAL ORGANISATIONAL POINTS

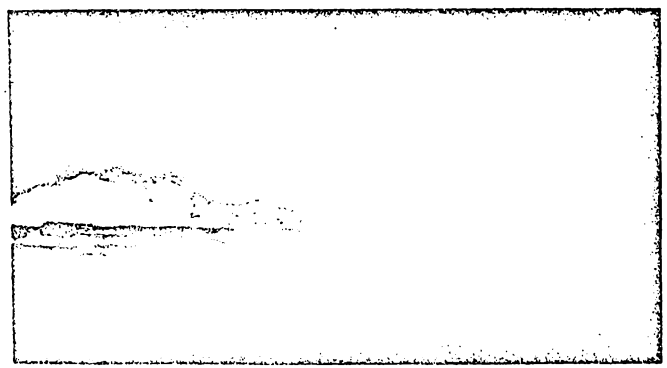
1. The discussion session will involve 30 minutes altogether: 5 minutes for getting the pupils settled and comfortable, 15 minutes for pupil reading of the story, and 10 minutes for the actual discussion. Sufficient copies of the story for your 5 pupils will be brought to the school by the visiting lecturer (Mr. Mundell or Mr. Katterns).

2. Apart from a few students posted to intermediate schools, the pupil group will consist of S.3, S.3/4 or S.4 pupils. Your Principal and Associate Teacher have been requested to help you select a suitable group of pupils. Where a course member is posted to a junior school class (New Entrants to S.2) the Principal has been requested to allow some special opportunities to have informal interaction with a selected group of S.3, S.3/4 or S.4 pupils prior to the day of the observation visit. Such opportunities will give students posted to junior school classes a chance to get to know their discussion group pupils.

3. Either Mr. Mundell or Mr. Katterns will be visiting course members to tape record the 10 minute discussion session. Your Principal has been requested to help in this activity by provising a fairly quiet place in the school. Where several students in one school are being visited within a given time period, the students concerned should negotiate the matter of order with the Principal and Associate Teachers to ensure that as little disruption as possible occurs to any other teaching tasks or responsibilities that they might have planned for that period.

4. VISITING SCHEDULE: A copy of the visiting schedule is being posted to each Principal. A copy is also posted on the Year 3 noticeboard. PLEASE CHECK THE MASTER SCHEDULE CAREFULLY FOR THE DATE OF YOUR VISIT.

Are You There Nessie?



This amazing photo, which Tim Dinsdale claims is "Nessie," was taken in 1960 at Loch Ness.

David Scott

It was the biggest slug I'd ever seen - five inches of black creepy-crawly! It looked like a snail without its shell. I'd nearly stepped on it as I climbed a hill above the lake in Scotland called Loch Ness (pronounced Lock Ness).

"Slugs grow big here," my companion said. "And our hunt may be for the grandfather of them all - a giant sea slug."

My guide was Clem Skelton. He belongs to a group that is trying to track down "Nessie." What is "Nessie?" No one knows for sure. But "Nessie" is the nickname for the famous Loch Ness Monster.

Skelton has seen the strange creature six times, once at midnight - "a huge hump surrounded by boiling foam" - from only 15 yards away. But as always, Nessie disappeared before he could take a close look.

More than one slippery creature is said to be living in Loch Ness. In any case, people have reported seeing a humped "what-is-it" for over 30 years.

For a long time the mysterious monster was considered just a joke. This often happens when someone is reported in the newspaper, on radio, or on television, as having spotted some unknown creature such as a sea serpent, a monster, or things like a flying saucer from out of space. For example, some climbers in the Himalayan Mountains reported a few years ago that they'd found huge footprints in the snow which must have belonged to some giant mountain man. Ever since, most people have accused the climbers of trying to "put one across" the public.

When they hear of the surprising stories of people who claim that they've seen unknown giant animals, many scientists shrug their shoulders and say that the stories are fables. These scientists usually base their arguments on three main points: First, they say that the world has been completely explored; secondly, they say that no new animals have been discovered for a long, long time; and thirdly, they say that most of these strange creatures said to exist are already extinct.

Some scientists, however, are a bit more open-minded. They think that perhaps the world still hides many kinds of giant and monstrous creatures as yet unknown. These scientists say that we should not make fun of people who claim to have spotted such creatures. Instead it is important to show that these creatures do exist, or do not exist.

As far as laughing about the Loch Ness monster is concerned, things changed quite a bit in 1966. In that year some photo experts of the Royal Air Force reported on their study of a movie film they had been given of the"monster." They said that there really is some huge object in Loch Ness - and it's probably alive!

The man who "caught" Nessie on film was Tim Dinsdale. One day in 1960 he was driving slowly along a road above the black water of Loch Ness. Suddenly he spotted a reddish-brown, hump-backed object floating about a mile away.

He hurriedly stopped his car and grabbed his movie camera.

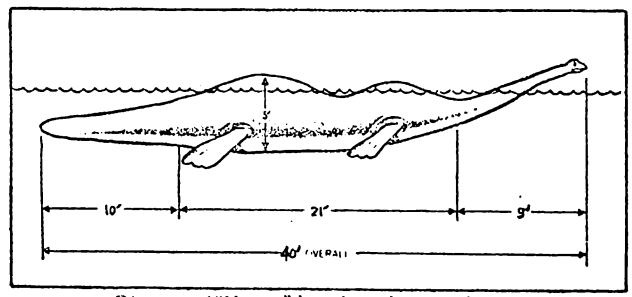


Diagram of "Nessie," based on photographs and reports of many eyewitnesses

The thing began moving toward the far shore. Dinsdale filmed what he was sure was the back of a huge animal. It was half in and half out of the water. The creature swam away in a slow zig-zag course. Soon it disappeared in a giant splash of foam. But Tim Dinsdale had Nessie's picture on 40 feet of movie film!

The film was shown on T.V. programmes all over the world. Unfortunately, many scientists who study animals (zoologists) still laughed about Nessie. But a small group of interested people decided to investigate further and they set up the Loch Ness Explorer Group. In 1964, the group gave Dinsdale's film to the photo experts of the Royal Air Force. "Here's a film," said the group. "Tell us what's on it."

Here are some of the conclusions of the 1966 report by the Royal Air Force experts:

1. The object rose three feet above the waterline.

2. It moved at ten miles per hour.

3. It was not a surface craft or a submarine. "It is probably a living object."

4. The normal body "rounding" suggested that there was at least two feet of it under the water.

5. A section cut through the object would not be less than six feet wide and five feet high.

The monster that had been something of a joke to many people suddenly became more respectable. A drawing and a model of the gigantic mystery creature were made. They were based on photos and on more than 100 eyewitness reports.

What a strange-looking animal it seemed to be! Some natural scientists say it looks like a reptile from the time of the dinosaurs. This giant reptile of long ago grew to a 30-foot length. Its body was shaped like a barrel, with four paddle-like legs. Above its long slender neck was a tiny head with a large mouth filled with pointed teeth.

These scientists also agree that Nessie is neither a whale nor a shark. They think that it could be a huge, unknown kind of sea slug. The small garden slug can stretch its body to enter worm holes. So a sea slug could shape its body into the one, two, three or more humps that different people say they have seen.

How did Nessie get into Loch Ness? From the sea, is one main idea. Until the end of the last Ice Age, the lake was an arm of the sea. Then the ice on the rugged rocks melted. The earth's crust rose, leaving the lake separated from the sea.

The lake's gloomy bottom is well-stocked with fish. What a perfect place for a settlement of monsters! Gradually, they could get used to fresh water.

Today the surface of Loch Ness is 52 feet above sea level. The lake is about 23 miles long and one to 1½ miles wide. It is one of the deepest lakes in Europe. The water never freezes. There is a wealth of salmon, trout, eels, pike. All this adds up to good living for the shy giant of Loch Ness.

Stories of the monster go back for hundreds of years. But the first reports of our times began in 1933. In that year, a road was blasted out of rock along the lake and many "Nessies" were reported seen in the following months.

Bits of eyewitness reports make startling reading: "Three humps churning through the water leaving a foaming trail.....

Head about the same width as neck, mouth 12 to 18 inches wide... Looked like an elephant's back, four feet high, 12 feet long..... Speed about 35 miles per hour."

Except for the number of humps, the descriptions are quite similar. The creatures, probably several of them, have been spotted in all parts of the lake.

The search for the Loch Ness Monster continues. Every fortnight, nine different watchers take their cameras to good viewing points on the lake. It's strange though that with all this watching, there have been fewer and fewer sightings of Nessie in recent years. Only a few long distance photographs that show little detail, have been taken.

Motor-boats, small submarines and aeroplanes are not much use in the search for Nessie. Even using a special deep water diving bell has not been successful. More money needs to be raised to help develop a more thorough search for Nessie using new and different exploring methods.

The people searching for Nessie would like the government to provide some money to help in their work. But many scientists and people do not agree with this suggestion, and say there are far more important things on which money should be spent.

The exploring group say we need to close in on the Loch Ness Monster or monsters. When we do, this will be a wonderful day for science. Someday we may find out how many there are. When we learn their habits, we can find how to protect and preserve them. Who knows? You yourself may someday have a chance to view the world's most famous monster - Nessie of Loch Ness.

HAMILTON TEACHERS COLLEGE

Address Correspondence to :
THE REGISTRAR
Telephone :
65-126 (4 LINES) 99-099
Telegrams :
"TEACOLL", HAMILTON

HILLCREST ROAD
Postal Address :
PRIVATE BAG
HAMILTON

CONFIDENTIAL

From R.W.Katterns:

With regard to the discussion sessions for which briefing was provided last week, please find below the directions for taking each session with five pupils from your classroom. Sufficient copies of the two stories for each session and two evaluation forms are enclosed.

With sincere appreciation,

R.W.Katterns

DIRECTIONS FOR DISCUSSION SESSIONS

Session No.1 Through the use of a variety of questions you are to stimulate discussion with a group of 5 pupils for a period of 10 minutes on the story entitled The Day the Bears Go to Bed. While it will be appropriate at certain points in the discussion to use memory-recall questions, most of your attention should be directed towards getting the pupils thinking about the content of the story e.g., understanding, interpreting, reasoning, reacting, judging and problem solving.

1. Allow approximately 15 minutes for the pupils to read the story.
2. Follow immediately with 10 minutes of discussion. Plan on paper in the way that suits you best. Remember, however, that the discussion should be kept to verbal interaction only — that is, you should not make use of any teaching aids such as the blackboard, pictures, charts etc.

Session No.2 Repeat the same day after a reasonable break, or the next day, with the same group of pupils but using the story Are You There Nessie ?

COMPARABILITY : B & O STORIES

Teacher: .....

1. Interest level?

2. Vocabulary level?

3. Potential for asking questions that challenge pupils to "think" about the content of the story (e.g. understanding, interpreting, reasoning, analysing, problem-solving, reacting and judging).

"Thinking" Questions I would probably ask (no order necessary)

B	O

Story: The Day the Bears Go to Bed

Range of Initial Questions Asked by Six Experienced Teachers:

LOW ORDER COGNITIVE DEMAND

1. Is there something in there that you didn't know before ?
2. Tell me anything else about bears.
3. What were the clues that the bears used as a signal ?
4. What happens to the bears' bodies when they sleep ?
5. What kind of study did the Craighead brothers do ?
6. The two scientists...why were they interested in the bears ?
7. What steps did the scientists take to try and increase the bear population ?
8. What time of day did etc. did this happen ?
9. What sorts of things did the scientists do to track the bears ?
10. Can you think of any other animals that hibernate ?
11. What is hibernation ?

MIDDLE ORDER COGNITIVE DEMAND

1. Why were they so interested in when the bears were sleeping...I thought the purpose of the exercise was to find out why the bears were reducing in number ?
2. Why do you think they chose to sleep in the one place for the one winter ?
3. To get back to hibernation....if you take meat out of the deep freeze after several months it's hard and cold... Why ?
4. What would you think about the prospect of hibernating during the winter ?
5. Did the bears all over the country go to bed on the same day or was it just in this one spot ?
6. In what ways are bears as intelligent as human beings ?
7. What would the countryside have looked like at this time ?
8. How would you feel in the same situation ?
9. What might happen if the scientists didn't use labels or tags ?
10. Can you explain in your own words what instinct means ?
11. What seems to be the reason for the bears going to bed ?
12. Why do the brothers Craighead track bears in Yellowstone Park ?

HIGH ORDER COGNITIVE DEMAND

1. Do you think people have the right to intrude... etc. ?
2. If you were going to study any kind of animal, what would you have to do to the environment ?
3. What is the author's purpose in writing this story ?
4. Is it a good idea to track bears this way...if so, why or why not ?
5. If you were tracking bears, what other sorts of things would you do to keep tabs on them ?
6. Say we were scientists tracking deer. What things would we do to find out about deer ?

7. Why do you think the story has this title ?
8. Is this story true or is it just made up ?
9. What do you think of the methods used to trap and track the bears ?
10. What really tells the bears to go to bed on the same day ?
11. If you were sent out to track bears, what would be the major difficulties you'd encounter ?

Story: Are You There Nessie ?

Range of Initial Questions Asked by Six Experienced Teachers:

LOW ORDER COGNITIVE DEMAND

1. What has the witness seen so far? How many times has he seen the monster ? What has he seen ?
2. What have other witnesses actually seen ?
3. The 1933 report gave much information. What was seen in the 1933 report ?
4. What was new in this story for you ?
5. When they gave the photo to the airforce to look at, did they tell them anything about it ? Did they tell them what was on it ?
6. Where is Loch Ness ?
7. How do they think that Nessie got into Loch Ness ?
8. When was it first scientifically accepted ?
9. How long ago was the Dinosaur Age ?

MIDDLE ORDER COGNITIVE DEMAND

1. What about people living there... what advantages do you think they have ?
2. Sometimes when people say they've discovered something others act peculiarly. Why do you think they acted like this in this story ?
3. Why would scientists want to find out about the Loch Ness monster ?
4. The person who photographed the monster had genuine evidence. Why then did people still doubt that there could be a monster in this lake ?
5. Can you think of anything that's stopping an all-out effort to track down the monster ?
6. What is particularly unusual about this Loch ?
7. Would a scientist believe that this story is true ? If so why ?
8. What does it mean when they say " scientifically accepted " ?
9. What about the things done already...Can you give me any reasons why they haven't seen it ?

HIGH ORDER COGNITIVE DEMAND

1. Do you think there is, in fact, a live monster in that Loch ?
2. What sort of things would you want to look for if you could take part in this debate ?
3. Which would be more convincing: just reading about this monster or actually seeing it ? Why ?
4. Supposing now, they did find the monster, and they were able to come close up to it.... What do you think they might learn from their close investigations ?
5. What do yourself think about the existence of Nessie ?
6. What evidence is there that actually proves that the monster is a fake rather than that it exists ?
7. Would you give any money to anyone collecting for the Save Nessie Fund ? Why ?
8. You've been asked to study the possibility that a monster exists in Loch Ness. What would you report back after your investigations of all the evidence to date ?
9. What methods would you use to discover the monster ?
10. Pictures seems to be the most important evidence so far. What is your impression of the photographic evidence ?
11. If you're not convinced about this monster, what would convince you then ?
12. What do you think this thing in the lake is ?

A.9 Communications with Schools

HAMILTON TEACHERS COLLEGE

Phone: 69.099

Private Bag,
Hamilton.

September 18, 1973

Dear Principal,

Further to my letter of 31 August, this letter confirms that the students listed below who are at present on section in your school are those I should like to visit for special observation purposes. This observation consists of tape-recording a 10-minute discussion session led by each student with 5 pupils. As my previous letter outlined, the whole observation visit should take about 30 minutes per student - 5 minutes for setting up, 10-15 minutes for pupil reading of a story, and 10 minutes for the discussion.

For your information, I enclose a copy of the story on which the student-pupil discussion is to be based, together with a set of directions being distributed to students who are participating in the observation programme. The directions will be discussed fully with these students in a briefing session during the in-college lectures on Wednesday, 19 September.

SPECIAL VISITING SCHEDULE

School	Student(s)	Date/Time
	Posted to a S.3/4 class:	
	Posted to NE to S.2 class-special allocation of S.3/4 pupils:	

I should be grateful if you would check the suitability of the visiting times above, and ask that you contact me by letter or phone in order that we can make an alternative arrangement should a visiting time provide difficulties. The special observation visit will be made by Mr. B. Hill and/or myself, depending upon the number of students in your school who are involved. Times for the visit have been co-ordinated with those of other college staff who will be doing the usual section visiting.

My 31 August letter outlined that the 5 pupils for a discussion session needed to be in the S.3, S3/4 or S.4 class range, and I seek your co-operation in helping to select a pupil group for each student. Guidelines for pupil selection are provided on the special sheet enclosed with this letter.

Where a student is posted to a S.3 or S.4 class, pupil selection will be a fairly straightforward matter of associate teacher and student discussion. However, because school postings in this class range are less than the number of students I need to observe for statistically sound data-gathering purposes, it is necessary to include in my sample a few students who are working with junior school classes (New Entrants to S.2).

Special arrangements need to be made for students in this latter category to have a group of 5 S3/4 children allocated them for the discussion session I wish to observe and tape-record. I ask your assistance in making such arrangements and also in making it possible for this group of students to have a reasonable number of informal contacts with their 5 pupils prior to the date of the observation visit. The informal opportunities envisaged here might consist of occasionally helping in the room of the associate teacher whose class the 5 pupils are in and embracing, if possible, some informal teaching activity. There will be numerous opportunities, of course, for familiarisation during student participation in playground and games supervision, but the addition of some classroom contacts would be advantageous. As a further help to this familiarisation need, wherever possible I have scheduled the observation visit towards the end of the school section, reserving earlier visiting dates for those students who are posted to S3, S.3/4 or S.4 classes.

To provide a valid picture of each student's ability in using skills associated with leading a story-based discussion session, it is important that planning of the discussion to be observed is done by each student on a completely independent basis. Students involved in the observation programme are being briefed along these lines with special direction that they should not seek planning assistance from the associate teacher, fellow-students, or college staff. Prior to the special observation visit, of course, associate teachers will have been providing their usual guidance with lesson planning over a range of curriculum areas. But data from my visit will be invalid if a student's discussion session represents someone else's suggestions, or if a student has had one or more rehearsal sessions with the story provided for the observation visit.

At this time may I express again my gratitude for any assistance you can provide in this data collection. While the observations made are related to setting up objectives for a Year 3 course in 1974, they are also contributing to a research project on analysis of teaching skills. The ultimate objective of this work is to produce programme materials which, it is hoped, will be of interest and of practical help to all teachers at the pre-service and in-service levels. The assistance of Principals and Associate Teachers in this work is sincerely appreciated.

R.W. Katterns,
(Head of Education Department)

GUIDELINES FOR SELECTING 5 PUPILS FOR STUDENTS

As early as convenient in the school section, allocate 5 pupils to the student from S.4, S.3 or from S.3 and S.4 who are approximately equivalent in general language and reading ability within the average to above-average range. Associate teachers will probably make use here of their day-to-day observations and impressions of pupils, and any data they may have available from informal and/or standardised testing.

Depending upon size of school, nature of the pupil population and number of students requiring groups, the ability criterion suggested above may be more difficult or less difficult to meet in different schools. The main concern is that a pupil group consists of children who have no major problems with independent silent reading, who are reasonably fluent in oral discussion, and who have no serious social-emotional or stability difficulties. It is hoped that the following guidelines provide sufficient flexibility for allocation of 5 pupils to each student:

1. The pupil group may come from S.4 only, S.3 only, or from S.3 and S.4. Where a group is chosen from one class level only, it is desirable that the children are a mixture of average to above average ability in general language and reading ability.

2. Where it is necessary to use both S.3 and S.4 children to make up a group, one or more able S.3 pupils might be mixed with S.4 pupils of approximately the same ability in general language and reading.

3. It is desirable, though not absolutely necessary, that each pupil group consists of a mixture of girls and boys. Pupil population in the S.3 - S.4 zone in some schools may not be able to meet the combination of ability criterion and mixture of boys and girls. It may even be necessary to have a group consisting of all girls or all boys, or of uneven weighting of the sexes.

4. The story chosen for the student-led discussion session presents no special word attack problems; it is comprehendable and of interest for both girls and boys in the S.3 - S.4 class range who are of average to above-average in general language and reading ability. In some smaller schools where making up a 5-pupil group could necessitate use of a S.2 pupil, an able S.2 child could cope quite well with the story's vocabulary and ideas.

HAMILTON TEACHERS COLLEGE

Address Correspondence to :
THE REGISTRAR

Telephone :
65-126 (4 LINES) 69-099

Telegrams :
"TEACOLL", HAMILTON

HILLCREST ROAD

Postal Address :
PRIVATE BAG
HAMILTON

10 June, 1974.

Dear Principal,

During Year 2 school section last year, special observation visits were made to a sample of students in order to audio-tape them leading a 10-minute discussion on a short story with a group of five pupils. The purpose of this visit was to gain data related to a course on analysis of teaching. This course proceeded with half of the sample in Term 1 this year, and the other half will take the course during Term 3. The course is part of a research project I am conducting on analysis of teaching with special emphasis on questioning skills.

For students completing the course in Term 1 this year, it is now desirable to make a further observation visit during their Year 3 school section. In addition, for students taking the course in Term 3 this year, it is important to have a further sample of their discussion leading skills for analysis purposes.

I have discussed these further observation visits with Mr. Dowling, the District Senior Inspector of Primary Schools, and with the college Principal, Mr. Allan. Both persons have given me approval to proceed.

The observation visit to students in the research sample who are posted to your school will take the same form as last year. It will consist of audio-taping a 10-minute discussion session led by each student with five pupils. The whole observation takes about 30 minutes per student: 5 minutes for setting up; 10 - 15 minutes for pupil reading of a story; and 10 minutes for the student-led discussion. Audio-taping equipment will be brought to your school and the only special requirement asked of you is a quiet location in the school for taping purposes.

I would be grateful if you would check the visiting times below, and ask that you contact me by letter or phone in order that we may make alternative arrangements should a visiting time provide difficulties. The special observation visits this year will be made by Mr. D. Mundell and/or myself, depending upon the number of students in your school who are involved. Visiting times have been carefully scheduled so as not to clash with the usual visiting undertaken by other college staff.

SCHOOL	STUDENT(S)	DATE/TIME
	Posted to a S. 3/4 class:	
	Posted to a N.E. to S.2 class (Special allocation of S.3/4 pupils required):	

Cont/.....

For your information, I enclose a copy of the story on which the student - pupil discussion is to be based, together with the set of directions being distributed to students who are participating in the observation programme. The directions have been discussed with these students in a briefing session prior to school section.

The five pupils for a discussion session need to be in the S4, S3/4 or S.3 class range, and I seek your co-operation in helping to select a pupil group for each student. Guidelines for pupil selection are provided on the special sheet enclosed with this letter.

Where a student is posted for section to a S.4, S.3/4 or a S.3 class, pupil selection will be a fairly straightforward matter of Associate Teacher and student discussion. However, some of the student sample being used have been posted to junior school classes in order to meet the college requirement of coverage of school divisions over all section postings. In these cases it will be necessary to make special arrangements to have a group of five S.4, S.3/4 or S.3 pupils allocated to them. I ask your assistance in making such arrangements, and also in making it possible for any student in this category to have a reasonable number of informal contacts with the five pupils prior to the date of the observation visit. These informal opportunities might consist of occasionally helping in the room of the associate teacher whose class the five pupils are in, and embracing, if possible, some informal teaching activity. There will be opportunities, of course, for familiarisation during student participation in playground and games supervision, but the addition of some actual classroom contacts would be advantageous.

To provide a valid picture of each student's discussion leading skills, it is important that planning of the discussion to be observed is done by each student on a completely independent basis. Students have been briefed along these lines, with special direction that they should not seek planning assistance from their Associate Teacher, fellow-students, or college staff. Prior to the special observation visit, of course, associate teachers will have been providing their usual guidance with lesson planning over a range of curriculum areas. But data from the special visit will be invalid if a student's discussion session represents someone else's suggestions, or if a student has had any rehearsal sessions with the story provided for the observation visit.

At this time may I express sincere gratitude for any assistance you can provide in the data collection described above. As I indicated in my letter to Principals last year, the main objective of this research project on teaching skills is to produce materials which will be of practical help to all teachers at both the pre-service and in-service levels. The assistance of Principals and Associate Teachers in this work is sincerely appreciated. By early next year observation data will have been analysed, at which time I hope to be able to share the findings with interested Principals Associations, school staffs, and other professional groups.

Sincerely yours,

R.W. Katterns
Head of Education Department.

A.10 Post Post-test Directions

STORY TRIAL

NATURE OF THE TRIAL:

You have agreed to assist in analysing the potential of the story entitled The Alligator for use in future microteaching programmes in the college.

Your assistance will take the form of using a variety of questions to stimulate discussion on this story with a group of 5 pupils for a period of 10 minutes.

While it will be appropriate at certain points in the discussion to use memory-recall questions, most of your attention should be directed towards getting the pupils thinking about the content of the story - e.g. understanding, interpreting, reasoning, analysing, problem-solving and judging.

PLANNING THE DISCUSSION SESSION:

Plan your discussion session on paper in the way that suits you best. Remember, however, that the discussion should be kept to verbal interaction only - that is, you should not make use of any teaching aids such as the blackboard, pictures, charts, or any special apparatus.

It is extremely important that your discussion plan is done independently. Please do not seek any assistance from fellow-students or college lecturers.

ORGANISATIONAL POINTS:

1. Special arrangements will need to be made for allocating to you a group of 5 S3/4 pupils at Hillcrest, Knighton or Silverdale Normal Schools. A special arrangement will also have to be made during Week 2 of Term 3 whereby you can attend one of these schools with Mr. Hill or Mr. Katterns at 9.00 - 10.30 a.m., 11.00 a.m. - 12.00 noon, or 1.00 - 3.00 p.m. in order that an audio-tape record of your discussion session can be made.

2. The recording of your discussion session should take approximately 30 minutes. The first 10 minutes will be used for familiarising yourself with the pupils' names and chatting informally with them. Then, 20 minutes will be used for the discussion session: about 10 minutes for pupil reading of the story and 10 minutes for audio-taping the discussion session.

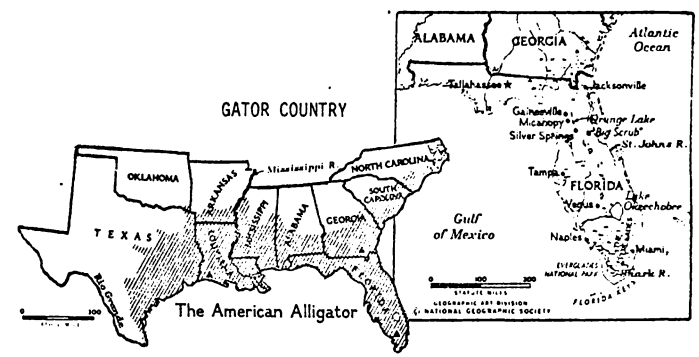
Thank you sincerely for your assistance,

R.W. Katterns.

The Alligator

Many people think that the alligator is ugly, fierce, and frightening--an animal to view from a distance! Some think dead gators are the best gators; they prize the belts, boots, and bags made from alligator skins. Probably most people never even think about alligators. But people who are concerned about our environment do. They worry that one day the alligator may be gone forever. Like the dinosaur, this animal may become extinct.

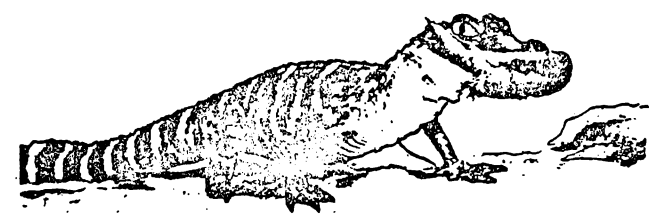
The American alligator, one of our last reminders of the age of dinosaurs, is found only in the southern part of the United States. In Florida's Everglades National Park, alligators crawl among the high swamp grass, swim in the rivers and canals, and build gator holes.



The American Alligator

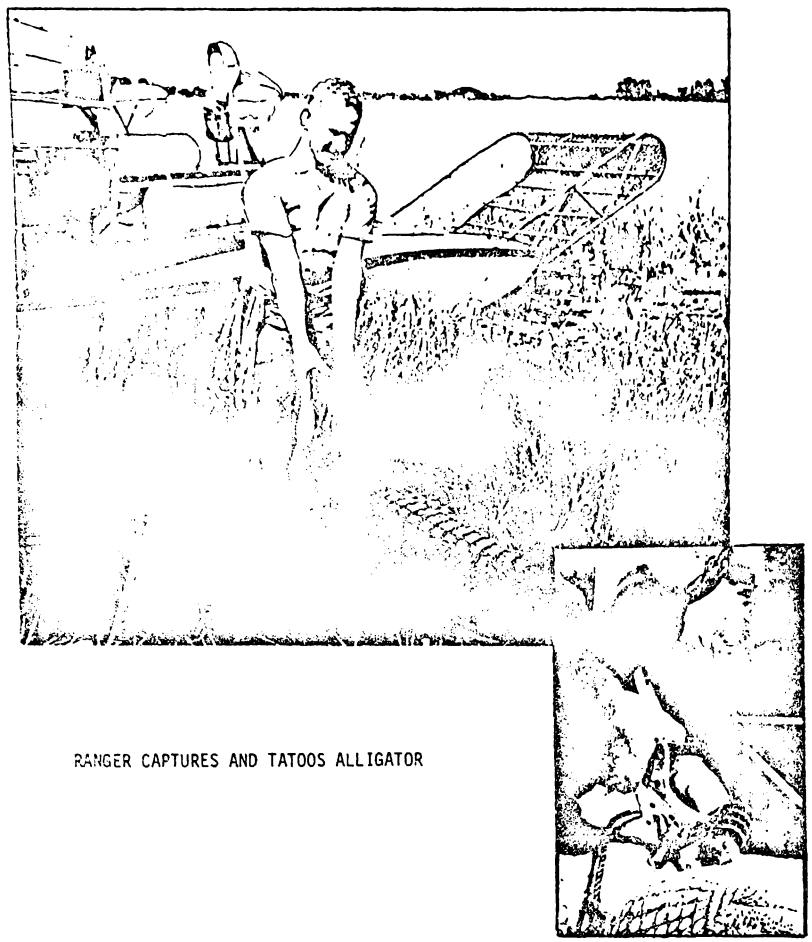
THE SPOONBILL IN EVERGLADES NATIONAL PARK

Alligators grow to be eight to ten feet long. The young alligator is dark brown but turns black when it becomes an adult. Alligators are members of the crocodile family but their snouts are shorter and wider than those of other crocodiles. Some kinds of Asian crocodiles have been known to attack people but the American alligator usually tries to hide when it sees a person.



BABY ALLIGATORS

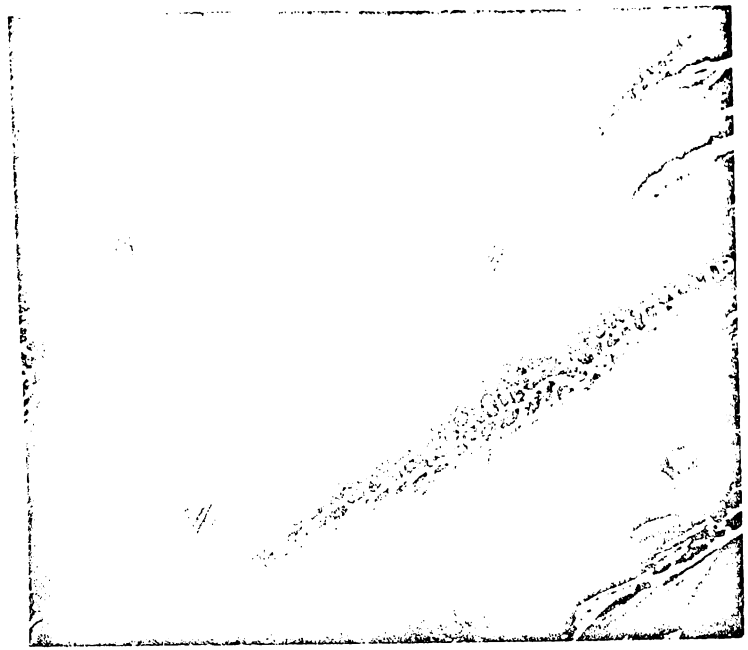
In 1969, rangers patrolling Everglades National Park by boat saw few alligators. The chief of Visitor Services, Richard A. Stokes, reported: "In 1959 I counted over 300 alligators in the Shark River area of the park. In 1969 I was lucky to find one."



RANGER CAPTURES AND TATOOS ALLIGATOR

Why did the number of alligators change so much in ten years? The answer is poachers! Poachers are lawbreaking hunters who kill alligators for large sums of money. At night, they go into the park by boat and shoot, hook, or club the gators. The poachers take only the skins and leave the dead alligators to rot. Later they sell the skins to fashion companies in the North. Park Rangers warned that alligators might become extinct if the poaching continued.

PARK RANGERS SEARCH FOR POACHERS

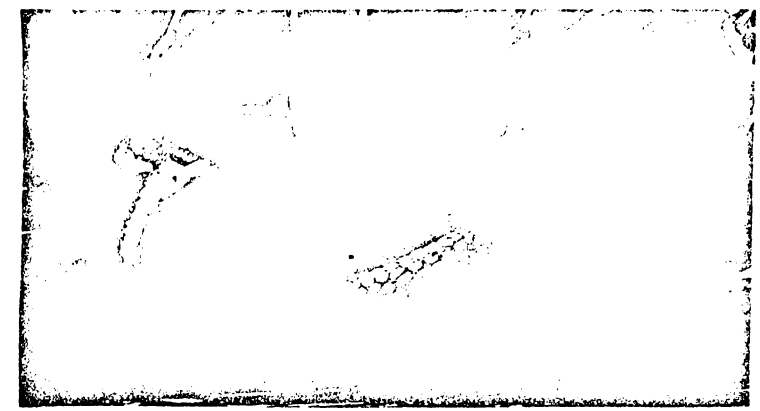


GARFISH

What difference would it make if all the alligators were killed? What good are alligators anyway? Rangers have found that the alligator is necessary for the survival of all the wildlife in the park!

Bass and other smaller fish depend on the alligator. It protects them from the fierce meateating garfish. This large fish has an enormous appetite, especially for bass. Garfish could easily eat all fish in the park if nothing stopped them. But nature has given the alligator the job of stopping the garfish. Alligators are the natural enemies of garfish.

They feed on garfish and keep their number under control. Just like the wolves keep the number of elk and moose under control by killing the weaker members of the herd.



GATOR ENJOYING A GARFISH SNACK

When the number of alligators gets too small, the rangers in Everglades National Park find that the garfish population increases. This is a serious problem. Too many garfish--or too few alligators--destroy the balance of wildlife in the park. To keep a balance, rangers are forced to do the alligator's job. The rangers must drop large nets into the water and thin out the fish. Then they kill all the garfish they've caught.

A great variety of other animals depend on the alligator, too! Among these are long-legged wading birds such as the spoonbill and stork. The deer, otter, turtle, frog, and tiny shrimp also need the alligator for survival. It is remarkable that one animal can be so important to so many others. The key to the alligator's importance is the gator hole.

A gator hole is a water-filled pool where alligators live. Some holes are small. Others may be as big as 200 feet across. When the park's water begins to dry up, alligators dig deeper into their holes. The water that collects in these deep pits will help the alligators stay alive during the dry period.

GATOR HOLE

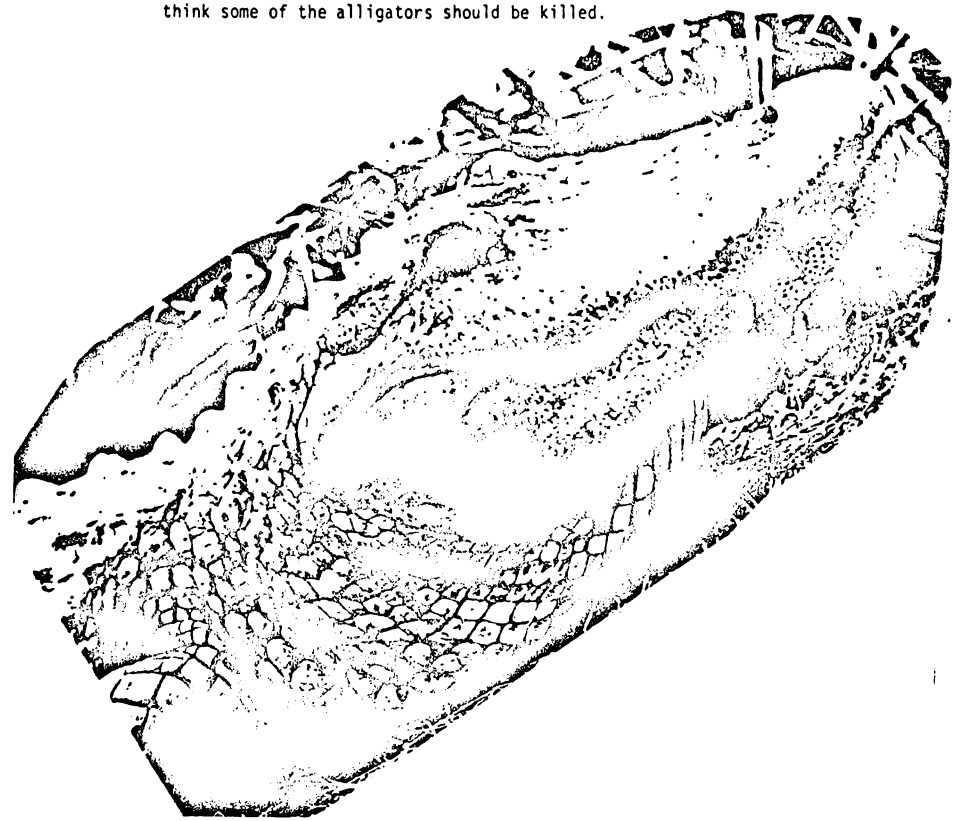
During the winter, the park's water supply goes down. Then alligator holes become "survival holes" for birds, mammals, amphibians, fish, and other reptiles. Without the water in these holes, most of the animals would die.

Since alligators are so important to many forms of wildlife, ecologists decided that something should be done to stop poachers. They helped pass a strict law against poaching. But what really saved the alligator were laws passed in northern states. These laws made it illegal to sell products made from alligator skins. For the last five years, very few alligators have been killed.

In this part of the country, humans are the only natural enemy of the adult alligator. Now that alligators are not being killed by hunters, they are increasing in number very fast. Park rangers think more than one million of them are alive today.

Since there are so many alligators, there is not enough food to feed all of them. Now alligators are beginning to eat many of the small furry animals such as muskrats and mink. There has even been one reported incident of an alligator attacking a human.

Since the population of alligators seems to be growing very rapidly, wildlife authorities are being asked to remove the ban on alligator hunting. Just five years after hunting was stopped, people think some of the alligators should be killed.



APPENDIX B

DATA COLLECTION AND MEASUREMENT

B.1 Sample of a Coded Lesson Transcript

UNIVERSITY OF WAIKATO
TEACHER EDUCATION RESEARCH PROJECT
IN MICROTEACHING

Audiotape Transcript for Discussion Lesson, Post, 1974

TEACHER I.D. NUMBER: 20 / 35 10 20 2 11 2-1

RECORDING: 10 minutes from the beginning of the lesson transcribed from a Sanyo cassette tape (Model M-2500).

STIMULUS MATERIAL: Are You There Nessie? (Story)

PUPILS: CLASS: Std. 3/4

1. 1
2. 2
3. 3
4. 4
5. 5

T. talk 3 min 0 secs
P. talk 5 min 47 secs
Total = 8 min. 47 secs

		X	Y	M	E
T	Right, now that you've read over this story, is there anything you'd like to say about the article ... just about it generally?	sub S Q M			
P5	That the, ah ... animal was fairly dangerous.	A'			
T	What makes you think that?	p caw			
P5	Oh, 'cause of the size of it.	A'			
T	Yes. Has it harmed anyone?	Ac			
P5	No, not yet.	p clar A'			
P4	No.	+			
T	Mhm, good. Any other points?	p clar			
P	I didn't know the Loch Ness monster was so big. I thought it was, you know, just (INDISCERNIBLE 3 WORDS).	A 2|3			
P	Mhm, like a (INDISCERNIBLE WORD).	I'			
T	Mhm. Anything else?	Ac			
P	I though it had a lot bigger head, but it's a small one.	p clar A 2|3			
P	Mhm, the body's a lot bigger than the head.	I'			
T	When you hear the word "Loch Ness Monster", what do you actually think of?	Q M			
P	Just an imaginary thing.	A'			
P	Sort of a great, big creature in the water.	A1'			
T	Mhm.	Ac			
P	Yeh, a sort of a snake-like creature.	A1'			

No.20

T	Mhm.	Ac
P	I think of the Abominable Snowman.	A1'
T	Yes, that was mentioned in that ... the Himalayan Mountains. [What's that bit ... when they say "Ever since most people have accused the climbers of trying to put one across the public." That's trying to fool them. Do you think this is what they're doing with the Loch Ness monster?	Ac Tc Ssub Q EV
P	No.	Y/N
P	No.	
P	'Cause, um ... I just ... especially when on TV they showed ... the monster in the water ... how long it was ... it was just the head. --	A1 4+
T	Mhm.	Ac
P	-- They had a film of it or something.	A1 4+
P	No, they ... they had a small recorder.	I 4+
P	Yes.	
P	-- I saw it in the paper. (INDISCERNIBLE) about the monster. It had a big head.	I 4+
P	There's an imaginary animal in New Zealand the same as that. A Japanese boat saw it.	I 2/3
T	Okay, right. You all think it exists.	Ac Tc
	Well, what do you think would be the best way of proving to all the rest of the people that there is a Loch Ness monster?	Q SY
P	Make a film about it (plus ONE MORE SUBSTANTIVE PHRASE INDISCERNIBLE).	A 2/3
P	Yeh.	
P	Yeh.	
P	A modern-day film.	I'
T	Mm. And how are you going to do that because people have tried to ... photograph it?	Ac P caw
P	You've got to find him ... catch him first.	A'
T	Mhm, mhm.	Ac
P	Yes 'cause most people when they see it, they haven't got their cameras around their head, and they make a big dash for it and when they finally get it, it's gone ... it's moving too fast.	I 4+ Ac
T	Mhm, mhm. [Well do you feel more money should be spent on a more thorough search for the Loch Ness monster?	Q EV Y/N
P	Yes.	
T	Why?	P caw
P	'Cause some people say it's there, and some of them say it's only in people ... they're checking the people that say it doesn't exist.	A 2/3 Ac
T	Mhm, mhm. [Why do you think there have been fewer sightings of this monster?	Q C

No.20

P	Some people have been too scared to go near it.	A'
Pupils	(CHUCKLES).	
T	That could be.	Ac
P	Maybe it's because it's ... very ... real scared. It only comes into shore a few times.	A1 2|3
P	Probably it's a deep-sea monster.	A1'
T	Mhm. Well how would he get into the lake if he were a deep-sea monster?	Ac P caus
P	(CHUCKLES).	
P	He's probably (1 WORD?) something, you know, (1 WORD)?	A2|3
P	Probably it's (1 WORD?), um ... 'cause when you ... 'cause in the deep sea it probably goes down 'cause it can't go down deep enough when it's in the lake.	A1 2|3
T	Mhm. What do you think, Sharon?	Ac PR
Sharon	Um ... it's probably got used to it ... fresh water when the, um ... land rose. Might have got used to ... ah, fresh water.	A2|3 +
T	Very good. Um ... are the scientists correct in saying that the world has been completely explored? This is on page 2.	Q EV S proc
P	No -- .	Y|N
Pupils	No. No. (CHORUS).	
P	-- 'cause not even the --	Y|N
P	'Cause some of the places ... in the bush, nobody's ever seen before.	A1 2|3
T	Mhm. What other places? I mean, you could find monsters or ... beasts that we never might have heard of.	Ac P clar SS Sub
P	Because there's some animals in the zoo that, you know, they've only just found them recently.	A2|3
T	Mhm, mhm.	Ac
P	Could be some that nobody would know yet.	A1'
P	'Cause they're too scared to go up mountain climbing and that.	I'
P	Too scared to go out and catch a real monster or something.	I'
T	Mhm-m. What about ... they also say that there are no new animals that have been discovered for a long time. Do you think there are many ... new animals around that we just haven't found?	Ac SSub Q EV
P	One or two ... not ... not much.	A2|3
P	There's one animal that's like a zebra. It's like a giraffe ... it's kinda in between, and it's only just been found.	A1 4+ Ac
T	Mhm, mhm. And the third thing the scientists say is ... is that most of these strange creatures said to exist are already extinct.	S Sub

No.20

	Do you ... if the scientists ... think that perhaps this may be, why ... why should other people believe?	(FS) Q^{c}
P	'Cause scientists, some of them have seen it.	A^{1}
P	'Cause maybe scientists they just ... science people they just stand on the beach and look hopeful.	A1$^{2/3}$
Pupils	(CHUCKLES).	
T	You said that some people have seen it Sharon. If you saw a light flashing across the sky at night what would you think it was?	SSsub pref
Sharon	Oh, a shooting star.	A^{1}
T	Mhm.	Ac
P	I'd think it was an aeroplane.	A1^{1}
T	Mhm. Say it was a funny shape, it wasn't the same shape as an aeroplane.	Ac pcaw
P	A comet.	A^{1}
T	Mhm.	Ac
P	I would think it was ... some kind of a U.F.O. or something.	A1^{1}
Pupils	(CHUCKLES).	
P	Yeh.	+
T	Good. Well why would you think that?	pcaw
P	'Cause they ... if it was a ... peculiar shape, well it ... they're really (1 WORD?). It's got that ... round shape 'cause most planes have to have wings, or helicopters ... you can see the blades going round (3 INDISCERNIBLE WORDS) --	A^{4+} Ac
T	Mhm.	
P	-- with the lights on them.	A^{4+}
T	Mhm, mhm. So some people have seen U.F.O's too, haven't they?	Ac pclar
Pupils	Yes. Yes. (CHORUS)	CHOR/YN
P	Uh, in a maize paddock they found these big triangular places where the ... tripods went down, from a U.F.O., they think.	A1$^{2/3}$
P	One boy in this classroom he reckoned he saw it ... and --	I^{4+} Ac
T	Mhm.	
P	-- we saw, um ... we thought we saw one once 'cause we were ... on a sheep farm and ... our boss ran out and said, "Did you see the U.F.O.?" and it ... and it was flying round the, um ... valley. It had landed on a ... a thing, and had just taken off again.	I^{4+}
P	Might be just somebody just playing a joke with ... some ... um scientific craft they're trying to put up.	I$^{2/3}$
P	Mhm, I've seen these things in the sky.	I^{1}

No.20

Pupils	(CHUCKLES).	
T	That's a very good idea, that one about ... someone playing a joke. Why don't some people like scientists believe these things?	+ U Q
P	'Cause there's some dumb people, you know, they've just got out of gaol, and they're a bit mental, you know, they make these craft inventions.	A^{4+}
P	Just be ... just be on the (1 WORD?) with it.	$A1^{1}$
P	Yeh.	
T	Mhm.	Ac
Pupils	Yeh. Yeh. (CHUCKLES).	
P	(2 WORDS?).	$A1^{1}$
P	Look as if it (1 WORD?) on the bottom or something.	$A1^{1}$
Pupils	(CHUCKLES).	
T	Well do you think this is perhaps what might have happened to the Loch Ness monster?	p^{ref}
P	No, not really, 'cause, ah ... --	$A^{2/3}$
P	No.	
P	-- there's a film on it: *You Asked For It* and, um ... they showed, um ... 40 feet of film, I think, about it.	$A^{2/3}$
T	Mhm.	Ac
P	Yeh, it was on television.	I^{1}
T	But you can make up films too --	p^{caw}
P	Yeh.	
T	-- just the same as making up things that fly in the sky.	p^{caw}
P	Er, this (1 WORD?), ah, this (1 WORD?) I think, he went out in a boat 'cause he saw something and he settled down in this place and a great big head came out.	A^{4+}
T	Mhm, mm. Have any of you any ideas about people playing jokes like that?	Ac p^{ref}
P	Yeh they could be, but some people make the ... Loch Ness monster out of tin or something, its head moves up and down and that.	$A^{2/3}$
P	Yeh.	Ac
T	Mhm.	
P	But some people ... there might be a bit of rock or something in there.	I^{1}
P	Or some people might dress up as the Loch Ness monster or something like that and somebody might ... see them.	$I^{2/3}$
T	Mhm. If it was a dark night and you saw a ... a rock or something in the lake, you might mistake it for a	Ac TC
P	Some beastly monster.	I^{1}

No.20

T	Could you do that?	P clar
Pupils	Yes. Yes. (CHORUS)	CHOR Y/N
P	Quite easily.	A1'
P	Quite easily.	(A1')
P	'Cause if the waves are coming up you'd think it'd be going like that (SHOWS). The rock'd be ... sticking down and going up and you ... wouldn't see the waves.	I4+ +
T	Right. Now let's suppose that there is a Loch Ness monster and that there's a few more around the world, and they start breeding and populating the world. Now what are we going to do about them if they ... ?	SSub QSy
P	(2 WORD SUB. ANSWER INDISCERNIBLE).	A1
P	Get them into the zoo so that more people can see them.	A1 2/3
P	Yeh, (1 MORE SUB IDEA).	I2/3
P	But ... it'd be quite hard ... getting ... there are no whales in captivity except for the killer whale, 'cause you can't get a whale into a great big pool 'cause you'd have to be ... rich to do that.	I4+
Pupils	(CHUCKLES).	Ac
T	Mhm. Ah, if dinosaurs still roamed the earth, how would we be able to ... keep them ... their numbers down so that they didn't start taking over the earth?	QSy
P	You'd have to use the army. (CHUCKLES)	A1
Pupils	(SOFT LAUGHTER)	
P	Doubt if they would, 'cause of some ... of the, ah ... they eat each other some of them.	A1 2/3
P	We'll keep the male ones then. Get rid of the females.	I2/3
P	(CHUCKLES)	
T	What'll happen when the male one dies though?	P caw
P	Oh, I don't know (CHUCKLES).	A1
T	You don't know. Um ... well ... what I'm trying to get here is --	Ac
P	Just keep one female and (2 WORDS INDISCERNIBLE).	I2/3
P	Put it out where ... no one can see him ... place or something. (CHUCKLES). Get rid of him.	I2/3
T	Perhaps people are a bit scared that if there is such a thing as the Loch Ness monster, we might get a few more of them. Do you think perhaps that this might be an idea?	SSub QPEV
P	But the Loch Ness monster haven't ... hasn't killed anyone have they? --	IQ
T	No.	APQ

No.20

P	-- Don't even look.	I¹
T	No, that's right.	+
P	It hasn't sunken any boats yet.	I¹
Pupils	(CHUCKLES)	
T	No - o, there's not that many on the loch ... on the ... actual lock.	+bec
P	Yeh.	
P	With the monster, it ... nobody's really been after it to attack it, so it's hard ... you can't really ... it knows what to do ... if it ... wasn't attacked it doesn't really know whether friends or doesn't know whether they're dangerous or not.	I⁴⁺ Ac
T	Mhm. Well what should be done with such creatures if we do find some?	Q^SY
P	Oh, they might as well keep them 'cause they haven't done any damage so far.	A²|³
P	If they do damage, um ... if they do a lot of damage, I reckon you should make them extinct ... oh, I dunno (CHUCKLES).	I²|³
P	Yeh.	
T	What do you think, Sharon?	R
Sharon	I reckon you should keep them.	A¹
T	Mhm, mhm.	Ac
P	If they're dangerous put 'em in captivity. They can't snap your hand off or something like that.	A¹²|³
P	But no ... every animal is ... is ... quite a bit of animals is dangerous but ... they all haven't got extinct yet for a long time.	I²|³
T	Mhm, is that right. Mhm.	Ac
P	If we leave them in their own environment, they're just ... they're the same.	I²|³
P	But most animals don't attack. The people think they're ... liable to attack, and they do things, but it's only the people's fault 'cause they --	I⁴⁺
P	The buildings.	I¹
P	-- yeh, they're building in, and ah, like the lion, some people shoot 'cause they say it's about to attack them but ... all the buildings are getting so close and it has to go out to get some food: --	I⁴⁺
T	Mhm.	Ac
P	-- 'cause all the beasts are getting killed off.	I⁴⁺
T	What you said, um, Rex ... about, um ... you'd keep 'em in their own environment, if we did want to keep one or two of these animals in a zoo, how would we be able to adapt them to a new environment?	U^Q

No.20

P	They would have to have a male and a female, put them together ... ah ... and when they have their babies they'd get used to it and sell them.	$A^{2}\|3$	10 MINS.
T	Mhm, mhm. And they'd grow up actually in a zoo or something like that, they're used to it.		

RANDOM No: 35

EXPTL. No.: 20

GROUP: A-6

(MT) OBN. CONTROL

MO (HC) N.A.

PERF (CHN) N.A.

AUDIO (VIDEO) N.A.

LO/DUE (HI/DUE)

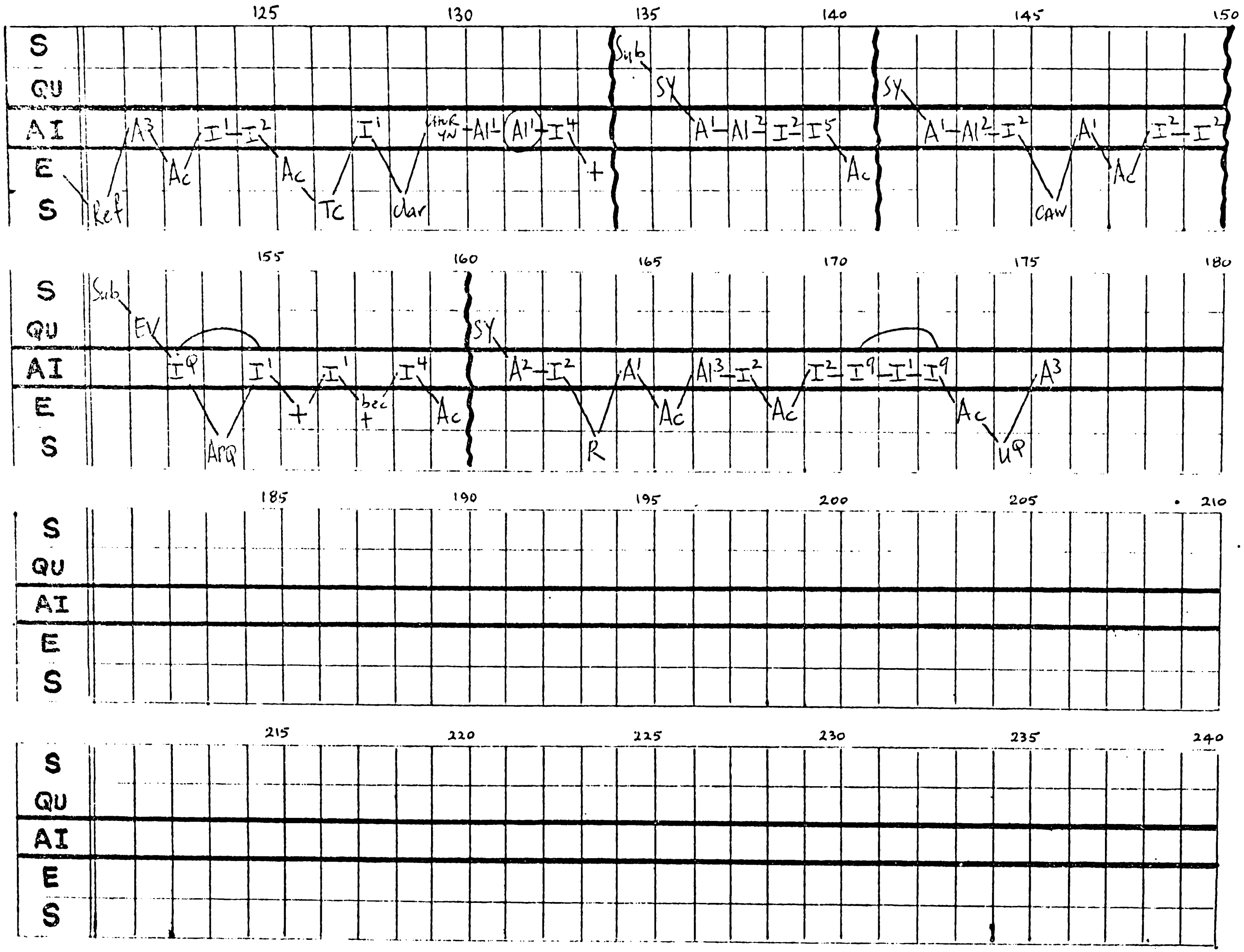
COMPUTER REF.

351 02021121

NOTES

~~PRE~~/POST

PAGE 20/1



RANDOM NO: 35

EXPTL. NO.: 20

GROUP: A-6

MT OBN. CONTROL

MO HC N.A.

PEER CHN N.A.

AUDIO VIDEO N.A.

LO/DUE HI/DUE

COMPUTER REF.

3510202 1121

NOTES

~~PRE~~/POST

PAGE 20/2

B.3 Data Summary Sheet for the Coded Transcript

~~PRE~~ POST I.D. 35

35102021121

TRANSCRIPT DATA SUMMARY

QUESTIONS

PEDAGOGICAL FUNCTIONS

Instructional (initiatory/sustaining)			
Procedural	Q^{proc}		
Rhetorical	Q^{rhet}		
Exhortatory	Q^{exhort}		
Substantive-affective (initiatory/sustaining)	Q^{affec}		
Substantive-logical (initiatory)			
	Q^{Op}		
	Q^{M}	//	2
	Q^{C}	//	2
	Q^{Ap}		
	Q^{An}		
	Q^{Sy}	////	4
	Q^{Ev}	~~###~~	5
Substantive-logical (sustaining)			
Redirect	R	/	1
Probe-redirect	PR	/	1
Opine	Q^{Op}		
Probe-prompt	P^{prom}		
Probe-clarify/amp.	P^{clar}	~~###~~ /	6
Probe-crit.awareness	P^{caw}	~~###~~ ///	8
Probe-refocus	P^{ref}	///	3
Use pupil ideas	U^{Q}	//	2
Pupil question to pupil(s)	PQP		
Substantive-logical/ Substantive-affective (initiatory/sustaining)			
Repeats	0		
Aborts	/		
Repeat-aborts	ø		
Attached prompts	P^{prom}		
False starts	FS	/	1

TQ = 35

SUBSTANTIVE-LOGICAL MEANING

Initiatory			
Low order:			
Opining	Q^{Op}		
Remembering	Q^{M}	2	2
Middle order:			
Comprehending	Q^{C}	2	2
Applying	Q^{Ap}		
High order:			
Analysing	Q^{An}		
Synthesising	Q^{Sy}	4	9
Evaluating	Q^{Ev}	5	
TOTAL SL INITIAL QUESTIONS	TSLQ		13

Probing			
Low order:			
Opining	Q^{Op}		
Middle order:			
Clarifying/ amplifying	Q^{clar}	6	6
High order:			
Critical awareness	P^{caw}	8	11
Refocusing	P^{ref}	3	
TOTAL SL PROBING QUESTIONS	TSLP		17

STRUCTURING WITH QUESTIONS

With	Q^{Op}	Q^{M} 1	Q^{C} 1	Q^{Ap}	Q^{An}	Q^{Sy} 1	Q^{Ev} ////		7
With	Q^{Op}	P^{prom}	P^{clar} 1	P^{caw}	P^{ref} 1	U^{Q}	PQP		2
TOTAL STRUCTURING WITH QUESTIONS									9

TOTAL EPISODES 13 MINUS SUB.AFFECTIVE EPISODES 0 = TOTAL SL EPISODES 13

TEACHER TALK

Total teacher talk time (1/13)		3	00
Total pupil talk time 180 527		5	47
TOTAL TALK TIME		8	47

PUPIL TALK

	A	AI	I	Totals
1 word/idea	~~#### ### ///~~ 13	~~#### ### /~~ 11	~~#### ### //~~ 12	36
Sev. ideas 2/3	~~#### ### //~~ 12	~~#### ### ///~~ 8	~~#### ### ####~~ 10	30
Ext. ideas 4+	/// 3	// 2	~~#### ##~~ 7	12
TOTALS	28	21	29	78

AVOIDS

Repeats pupil answer	Ac^{rep}		0
Answers own question	ACQ		0
Asks Yes/No question	Y/N CHOR/YN		5
TOTAL AVOIDS			5

Y/N CHOR/YN 5

USES PUPIL IDEAS

With a question	Ac^{Q}	//	2
With statement	Ac^{S}		0
Paraphrases	Ac^{para}		0
TOTAL USE PUPIL IDEAS			2

I^{Op}

I^{Q} 1

	A	AI	I	TOTAL
TOTAL PUPIL RESPONSES	33	21	30	84

B.4 Measurement summary for coded transcript.

SUMMARY: DEPENDENT VARIABLES MEASURES I.D. 3510202121

CONTROL FUNCTIONS OF TEACHER QUESTIONS

	PRE	POST
1. FLUENCY-CONTROL		
Total questions	86	35
Less instructional	0	0
Less affective	0	0
Less O / Ø AP FS	20	1
TSLQ	66	34
TSLQ as ratio of TQ =	66/86	34/35
2. COGNITIVE EPISODE CONTROL	PRE	POST
Total episodes	16	13
Less affective	0	0
Total cognitive =	16	13
3. EPISODE SUSTAINING TENDENCY	PRE	POST
Total R + PR + Q^{op} + P PQP + U_Q as ratio of total SL episodes	51/16	21/13
4. REDIRECTION TENDENCY	PRE	POST
Total R + PR as ratio of TSLQ	15/66	2/34
5. PROBING TENDENCY	PRE	POST
Total P as ratio of TSLQ	25/66	17/34
6. TENDENCY TO USE PUPIL IDEAS	PRE	POST
Total U^Q + U^{st} + Ac^{para} as ratio of total pupil responses	4/60	2/84
7. STRUCTURING TENDENCY	PRE	POST
Total S moves as ratio of TSLQ	6/66	9/34

	PRE	POST
1. FLUENCY CONTROL	.767	.971
2. COGNITIVE EP. CONTROL	16	13
3. SUSTAINING TENDENCY	3.188	1.615
4. REDIRECTION TENDENCY	.227	.059
5. PROBING TENDENCY	.379	.500
6. T. USE OF PUPIL IDEAS	.067	.024
7. STRUCTURING TENDENCY	.091	.265

LOGICAL FUNCTIONS OF TEACHER QUESTIONS

	PRE	POST
8. LOW ORDER		
Total LO as ratio of TSLQ	12/16	2/13
9. MIDDLE ORDER		
Total MO as ratio of TSLQ	1/16	2/13
10. HIGH ORDER		
Total HO as ratio of TSLQ	0/16	9/13

	PRE	POST
8. LOW ORDER	.750	.154
9. MIDDLE ORDER	.063	.154
10. HIGH ORDER	.000	.692

		PRE	POST
11.	HIGH ORDER PROBING Total HO probes as ratio of TSL Q	8/25	11/17

		PRE	POST
11.	HIGH ORDER PROBING	.320	.647

TEACHER-PUPIL TALK PATTERNS

		PRE	POST
12.	AMOUNT OF TEACHER TALK Total T. talk as ratio of total T. + pupil	302/441	180/527
13.	T. REPETITION PUPIL RESP. Total Ac^{rep} as ratio of total pupil responses (A + AI + I)	20/60	0/78
14.	ASKING YES/NO QUESTIONS Total Y/N as ratio of TSLQ	2/66	5/34
15.	TEACHER ANSWERS OWN QUESTION Total AQ as ratio of TSLQ	1/66	0/34
16.	ONE IDEA PUPIL RESPONSES Total one idea pupil responses as ratio of total A + AI + I	45/60	36/78
17.	SEVERAL IDEAS PUPIL RESPONSES Total several ideas pupil responses as ratio of total A + AI + I	10/60	30/78
18.	EXTENDED IDEAS PUPIL Total extended ideas pupil responses as ratio of total A + AI + I	3/60	12/78
19.	COORDINATE-REACTIVE RESPONDING PATTERNS Total AI + I + I^{Q} + I^{ep} as ratio of total pupil responses	2/62	51/84

		PRE	POST
12.	AMOUNT OF T. TALK	.685	.342
13.	T. $REPET^{N}$ PUPIL RESPONSE	.333	.000
14.	ASKING Y/N QUESTIONS	.030	.147
15.	ANSWERING OWN QUESTION	.015	.000
16.	ONE IDEA PUPIL RESPONSES	.750	.462
17.	SEVERAL IDEAS PUPIL RESPONSES	.167	.385
18.	EXTENDED IDEAS PUPIL RESPONSES	.050	.154
19.	COORDINATE REACTIVE RESPDG.	.032	.607

I.D. 351020211121

APPENDIX C

PRODUCTION OF TEACHING SAMPLES

C.1 Selection of teachers to provide teaching samples.

C.2 Directions for teachers providing teaching samples.

C.1. Selection of Teachers to Provide Teaching Samples

Selection Criteria

1. An Associate Teacher of the Hamilton Teachers College whose professional confidence, enthusiasm and willingness to experiment in teaching had been observed by the investigator during college-school contacts.
2. One male and one female for each laboratory to support the contingent focus and non-contingent focus requirement for the Analysis phase.
3. Currently teaching a S.3/F.1 class, thus working with children in the approximate age range of pupil groups to be used in the pre-test and post-test phases of the research, as well as in the microteaching treatment involving the teaching of children.
4. Willingness to volunteer.

On the basis of being given details of the objectives for the research and the nature of the microteaching programme, three weeks prior to the first videotaping sessions, six Associate Teachers volunteered their services. These teachers were divided into pairs such that a pair was assigned to one of the Teaching Laboratories 1, 2 or 3, with one pair also being assigned to Teaching Laboratory 5.

Briefing

Each teacher pair was briefed two weeks prior to the date scheduled for videotaping which was on an individual basis. The investigator issued each teacher with a set of guidenotes and material on the cluster of skills to which his/her teaching sample would largely relate. In the case of teacher pairs concerned with Teaching Laboratories 2, 3 or 5, notes were also issued on the

teaching skill clusters of previous laboratories. Each briefing session followed a standard pattern:

1. Discussion of the sensitisation model which draws the analogy between learning to teach, and learning to play golf.
2. Study of the directions for providing a teaching sample (see below).
3. Mutual study of the skills in the cluster for the laboratory concerned, including exchange of classroom illustrations and, if necessary, rôle-playing activity.
4. Discussion on questioning strategy in discussion lessons, and on various ways of planning such lessons.

Videotaping Sessions

During the week before a "take" session, each teacher was videotaped in a series of short and informal conversation and "teaching" situations in which the investigator and a research assistant acted as fellow discussants or 'pupils'. These activities were designed to allay any teacher anxiety about videotaping his/her teaching, as well as to "decosmetise" or reduce any preoccupations with physical appearance on the television screen. Videotaping of teaching samples involved two "takes" on the same discussion lesson, but using a different group of five pupils each time. Selection of the teaching sample for use in a laboratory was a matter of mutual decision between the Associate Teacher and the investigator having regard for: (1) the teacher's preferred teaching style; (2) the presence of overall questioning strategy and questioning sequences appropriate to the teacher's objectives for pupils; and (3) at least one instance of most (but not necessarily all) skills in the cluster of skills under consideration.

C.2 Directions for Teachers Providing Teaching Samples

Provision of Teaching Samples for Microteaching Research and Development Programme

Guidelines for Participating Teachers

The general objective of the forthcoming research on microteaching is to sensitise student teachers to alternative ways of using a wide variety of teaching skills in small group discussion lessons. These skills are mainly concerned with teacher questioning strategies.

The sensitisation approach to learning to teach seems to be one realistic way of overcoming the lack of evidence from research at present as to the nature of effective teaching. The model accompanying these notes paints a picture of the sensitisation process for you by drawing an analogy between learning to teach and learning to play golf. As this model shows, after gaining knowledge and awareness of a repertoire of skills, student teachers practise teaching in the microteaching laboratory where they are free to explore as many different ways as they can conceive for the use of skills. This helps them gain control not only of individual skills, but also of alternative sequences for skills. In particular, student teachers have opportunities to develop more sensitive and flexible control over their teaching behaviour -- that is, they learn to "read" the cues in the teaching environment which may signal the need to adjust their teaching behaviour and/or teaching goals. Subsequent to explorations with skills within the 'safe' environment of the microteaching laboratory, student teachers pursue sensitive control of teaching skills in the classroom setting.

A microteaching programme consists of a series of laboratory experiences, each of which concentrates on a cluster of interrelated skills. Over the laboratory series, a cumulative repertoire of skills becomes available to a participant for ever-widening personal experimentation. In the first phase of a laboratory, a group of students studies and analyses several videotaped teaching samples in order to learn how to discriminate and code the teaching skills which happen to be used. This is followed by opportunities to take short lessons with a small group of pupils, each "microlesson" being videotaped for replay and feedback discussion purposes. Feedback consists of student teacher peers providing the microteacher with objective data on what actually happened during his teaching performance. This helps the microteacher analyse and evaluate his own teaching. In keeping with the point above about

the nature of effective teaching, a feedback session does not involve student teacher peers or some supervisor telling the micro-teacher where he/she went "right" or "wrong".

In order to help with the analysis phase in one teaching laboratory, you are asked to provide a sample of yourself taking a discussion lesson with a group of five pupils from your own classroom. This sample will be videotaped so that participants in the microteaching programme may view it in order to discriminate and code the way in which you use teaching strategy and skills.

It is important to note that you are not being asked to provide a model of "the perfect way" to conduct a discussion session. On the contrary, your teaching sample will represent one way of handling a particular set of teaching objectives, for a particular group of children, related to a particular topic. In other words, your teaching sample will provide resource material for analysis purposes, as well as being a "springboard" from which microteachers may attempt to generate as many alternative approaches to this same lesson as possible. In short, the goal for microteachers is not to draw conclusions about what is, and what is not, "good" about your teaching, but to widen their personal horizons about a skills repertoire.

Specific Requirements

You are asked to take two 5-10 minute discussion lessons on the same topic with two different groups of five pupils from your own classroom. Arrangements will be made to have each of these lessons videotaped at the University of Waikato. The topic for your teaching may be of your own choosing, e.g., a discussion based on a story, a poem, a picture, a social problem, a current event, an interesting object, etc. In the lesson, you are asked to concentrate on verbal interaction, and to avoid the use of teaching aids such as the blackboard, charts, etc.

For each lesson, your goal will be two-fold:

1. To help the pupils achieve the particular learning objectives you plan for them.

2. To achieve these objectives by using questioning strategies as outlined in the manual issued to you.

The following points should be noted:

1. Try to use your usual or preferred discussion-leading style.

2. Try to use an overall questioning strategy, as well as certain questioning sequences within this, which you believe are appropriate for your planned objectives.

3. While you are asked to include as many as possible of the skills in the manual, do not feel bound by this. Use and adjust your questioning strategy -- as well as your teaching objectives -- as you see fit! It should be noted that if you purposely "force" too many instances of a particular skill, your teaching may become artificial and you may also jeopardise the educational quality of the lesson.

Organisation

1. Choice of pupils: socially and orally confident, but not necessarily above average in ability; a mixture of girls and boys in each group of five.

2. Meeting to discuss the teaching skills before videotaping begins -- to be arranged.

3. Videotaping: schedule to be arranged, including preliminary sessions if desired.

4. Two "takes": in case of technical problems with the video equipment, as well as to give you choice of the sessions to be used in the laboratory.

Your assistance in this microteaching research project is sincerely appreciated.

R.W. Katterns,
Head of Education Dept.,
Hamilton Teachers College

APPENDIX D

MICROTEACHING: SCHEDULE FOR TEACHING AND CODING

MICROTEACHING SCHEDULE

GROUP:	A1		B1	
LOCATION:	A2		B2	
SUPERVISOR:	A3		B3	

LAB. NO. 1

SESSION 1: SKILLS DESCRIPTION - TEACHING SAMPLE ANALYSIS

TASKS	SESSION 2			SESSION 3		
	TEACH 1	TEACH 2	TEACH 3	TEACH 4	TEACH 5	TEACH 6
TEACH - OBSERVE OWN TEACHING	A1	A2	A3	B1	B2	B3
COUNT ALL QUESTIONS	A3	A1	A2	B3	B1	B2
COUNT ALL CLOSED AND OPEN QUESTIONS	A2	A3	A1	B2	B3	B1
COUNT ALL CLOSED AND OPEN QUESTIONS	B1	B2	B3	A1	A2	A3
COUNT ALL PUPIL RESPONSES AND NIL-RESPONSES	B3	B1	B2	A3	A1	A2
COUNT "AVOIDS" • repeating answers • complex questions • answering own question	B2	B3	B1	A2	A3	A1

LAB. NO. 2

SESSION 1: SKILLS DESCRIPTION - TEACHING SAMPLE ANALYSIS

TASKS	SESSION 2			SESSION 3		
	TEACH 1	TEACH 2	TEACH 3	TEACH 4	TEACH 5	TEACH 6
TEACH - OBSERVE OWN TEACHING	B3	B1	B2	A3	A1	A2
COUNT ALL QUESTIONS	B2	B3	B1	A2	A3	A1
COUNT ALL CLOSED AND OPEN QUESTIONS	B1	B2	B3	A1	A2	A3
COUNT ALL PUPIL RESPONSES AND NIL-RESPONSES, PLUS COUNT "AVOIDS" AS IN LAB NO. 1	A3	A1	A2	B3	B1	B2
COUNT ALL REDIRECTS, PROBES, PROBE-REDIRECTS AND USING PUPIL IDEAS	A2	A3	A1	B2	B3	B1
COUNT ALL REDIRECTS PROBES, PROBE-REDIRECTS AND USING PUPIL IDEAS	A1	A2	A3	B1	B2	B3

LAB. NO. 3

SESSION 1: SKILLS DESCRIPTION - TEACHING SAMPLE ANALYSIS

TASKS	SESSION 2			SESSION 3			SESSION 4			SESSION 5		
	TEACH 1	TEACH 2	TEACH 3	TEACH 4	TEACH 5	TEACH 6	RE TEACH 1	RE TEACH 2	RE TEACH 3	RE TEACH 4	RE TEACH 5	RE TEACH 6
TEACH - OBSERVE OWN TEACHING	A2	A3	A1	B2	B3	B1	A2	A3	A1	B2	B3	B1
COUNT ALL QUESTIONS AND ALL STRUCTURING	A1	A2	A3	B1	B2	B3	A1	A2	A3	B1	B2	B3
COUNT ALL L.O., M.O. AND H.O. QUESTIONS	A3	A1	A2	B3	B1	B2	A3	A1	A2	B3	B1	B2
COUNT ALL L.O., M.O. AND H.O. QUESTIONS	B2	B3	B1	A2	A3	A1	B2	B3	B1	A2	A3	A1
COUNT ALL PUPIL RESPONSES AND NIL-RESPONSES	B1	B2	B3	A1	A2	A3	B1	B2	B3	A1	A2	A3
COUNT ALL REDIRECTS, PROBES, PROBE-REDIRECTS AND USING PUPIL IDEAS.	B3	B1	B2	A3	A1	A2	B3	B1	B2	A3	A1	A2

LAB. NO. 4

LEARNING TO USE THE "SQAIES" INTERACTION ANALYSIS CODING SYSTEM.

LAB. NO. 5

SESSION 1: SKILLS DESCRIPTION - TEACHING SAMPLE ANALYSIS

TASKS	SESSION 2		SESSION 3		SESSION 4		SESSION 5			SESSION 6		
	TEACH 1	TEACH 2	TEACH 3	TEACH 4	TEACH 5	TEACH 6	RE TEACH 1	RE TEACH 2	RE TEACH 3	RE TEACH 4	RE TEACH 5	RE TEACH 6
TEACH - OBSERVE OWN TEACHING	B1	B2	B3	A1	A2	A3	B1	B2	B3	A1	A2	A3
"SQAIES" CODING	B3	B1	B2	A3	A1	A2	B3	B1	B2	A3	A1	A2
"SQAIES" CODING	B2	B3	B1	A2	A3	A1	B2	B3	B1	A2	A3	A1
"SQAIES" CODING	A1	A2	A3	B1	B2	B3	A1	A2	A3	B1	B2	B3
"SQAIES" CODING	A3	A1	A2	B3	B1	B2	A3	A1	A2	B3	B1	B2
"SQAIES" CODING	A2	A3	A1	B2	B3	B1	A2	A3	A1	B2	B3	B1

APPENDIX E

SAMPLES: FEEDBACK DATA

Tg. Lab.1 – FEEDBACK DATA SHEET

MICROTEACHER: [illegible]
GROUP: A-1
DATE/TIME: [illegible] 3-4.30
SUPERVISOR: [illegible]

A-1

skills	1	2	3	4	5	T
ALL QUESTIONS	1	2	1	2	0	6
CLOSED QUESTIONS	1	2	2	2	0	7
OPEN QUESTIONS	1	0	0	0	0	1
PUPIL RESPONSES	5	7	6	6	4	28
PUPIL NIL-RESPONSES			1	1		2
REPEATING ANSWERS	1	1		1		3
COMPLEX etc. QUESTIONS						
ANSWERS OWN QUESTION	1			1		2

R. Digest article : French Canada.

Tg. Lab. 2 - FEEDBACK DATA SHEET

MICROTEACHER: .....
GROUP: .....A-1.....
DATE/TIME: .....Friday. 3-4.30...March. 15
SUPERVISOR: ...K. Stevens.....

skills	1	2	3	4	5	T
ALL QUESTIONS	1	1	1	0	0	3
CLOSED QUESTIONS	~	~	~	~	~	0
OPEN QUESTIONS	1	1	1	0	0	3
REDIRECTS	1	2	1	1	0	5
PROBES	1	0	1	3	2	7?
PROBE-REDIRECTS	1	0	0	0	1	2?
USE PUPIL IDEA	~	~	~	~	~	~
PUPIL RESPONSES	4	8	6	5	7	30
PUPIL NIL-RESPONSES	~	~	~	~	~	~
"AVOIDS" ~ REPEATING ANSWERS ~ COMPLEX &/or. QUESTIONS ~ ANSWERS OWN QUESTION	~	~	~	~	~	~

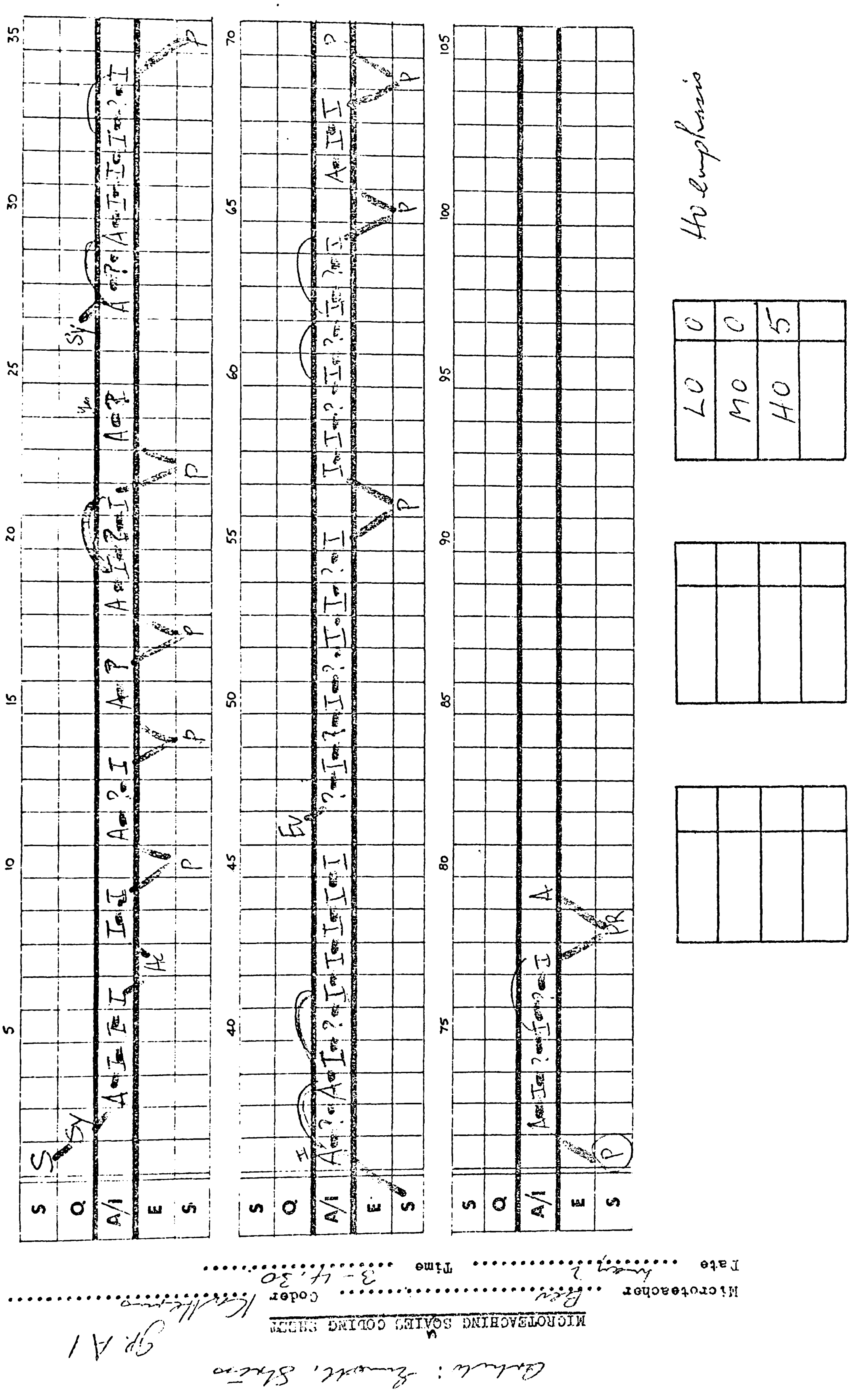
Tg. Lab. 3 – FEEDBACK DATA SHEET

Article:

MICROTEACHER: Kerry
GROUP: A-1
DATE/TIME: April 1 3-4.30
SUPERVISOR: Bill

L	M	H
0	0	5

Skills	1	2	3	4	5	6	7	T
STRUCTURING								0
ALL QUESTIONS	2	1		1			1	5
~~M.~~/ H.O. QUESTIONS (L M H)	2	1		1			1	5
REDIRECTS								0
PROBES	1	3	2	1	0	2	3	12
PROBE-REDIRECTS	1	0	1	1	1	0	0	4
USE PUPIL IDEA								0
PUPIL RESPONSES	7	7	5	4	5	9	6	43
PUPIL NIL-RESPONSES								
REPEATING ANSWERS								
COMPLEX etc. QUESTIONS								
ANSWERS OWN QUESTION								


MICROTEACHING SCALES CODING SHEET
Microteacher
Coder
Date
Time
3-4.30
LO 0
MO 0
HO 5
HO emphasis
Gp A1

APPENDIX F

PRE-TEST ANOVAS: PARTS 2 AND 3 RESEARCH DESIGNS

F.1 Part 2 Research Design: ANOVAS on Pre-test Teaching Performance

DEPENDENT VARIABLE 1: Fluency-control

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0215	4	.0053	.56	.69
Within groups	.8723	91	.0095		
Totals	.8938	95			

Bartlett's Test

M/C = 5.581 df = 4 P = .232

Homogeneity of variance accepted.

DEPENDENT VARIABLE 2: Cognitive Episode Control

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	44.5312	4	11.1328	.41	.79
Within groups	2446.2083	91	26.8814		
Totals	2490.7395	95			

Bartlett's Test

M/C = .506 df = 4 P = .972

Homogeneity of variance accepted.

DEPENDENT VARIABLE 3: Episode Sustaining Tendency

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	3.49848	4	.8746	.89	.46
Within groups	88.81113	91	.9759		
Totals	92.30961	95			

Bartlett's Test

M/C

DEPENDENT VARIABLE 4: Redirection Tendency

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0661	4	.0165	1.25	.29
Within groups	1.2032	91	.0132		
Totals	1.2693	95			

Bartlett's Test

M/C = 10.871 df = 4 P = .028

Homogeneity of variance not accepted.

DEPENDENT VARIABLE 5: Probing Tendency

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.1407	4	.0351	2.96	.023
Within groups	1.0792	91	.0118		
Totals	1.2199	95			

Bartlett's Test

M/C = 3.227 df = 4 P = .520

Homogeneity of variance accepted.

DEPENDENT VARIABLE 6: Tendency to Use Pupil Ideas

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0063	4	0.0015	1.64	.17
Within groups	.0873	91	0.0009		
Totals	.0936	95			

M/C = 23.133 df = 4 P = .001

Homogeneity of variance not accepted.

DEPENDENT VARIABLE 7: Tendency to Use Structuring with Questions

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.04823	4	.0120	2.45	.05
Within groups	.44747	91	.0049		
Totals	.49570	95			

Bartlett's Test

M/C = 2.225 df = 4 P = .69

Homogeneity of variance accepted.

DEPENDENT VARIABLE 8: Asking Initial Questions of Low Order Cognitive Demand

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0299	4	.0074	.27	.89
Within groups	2.4957	91	.0274		
Totals	2.5256	95			

Bartlett's Test

M/C = 4.104 df = 4 P = .392

Homogeneity of variance accepted.

DEPENDENT VARIABLE 9: Asking Initial Questions of Middle Order Cognitive Demand

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0105	4	.0026	.14	.96
Within groups	1.7168	91	.0188		
Totals	1.7273	95			

Bartlett's Test

M/C = 1.256 df = 4 P = .86

Homogeneity of variance accepted.

DEPENDENT VARIABLE 10: Asking Initial Questions of High Order Cognitive Demand

Analysis of Variance

Source of Variance	SS	df	MS	F	P
Between groups	.0227564	4	.0056	.39	.81
Within groups	1.3112569	91	.0144		
Totals	1.3340133	95			

Bartlett's Test

M/C = 6.629 df = 4 P = .156

Homogeneity of variance accepted.

DEPENDENT VARIABLE 11: Asking Probing Questions of High Order Cognitive Demand

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.09876	4	.0246	1.13	.34
Within groups	1.97978	91	.0217		
Totals	2.07854	95			

Bartlett's Test

M/C = 1.704 df = 4 P = .790

Homogeneity of variance accepted.

DEPENDENT VARIABLE 12: Amount of Teacher Talk

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0449	4	.0112	.56	.69
Within groups	1.8163	91	.0199		
Totals	1.8612	95			

Bartlett's Test

M/C = 2.962 df = 4 P = .564

Homogeneity of variance accepted.

DEPENDENT VARIABLE 13: Teacher Repetition of Pupil Responses

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.13418	4	.0335	2.21	.07
Within groups	1.38107	91	.0151		
Totals	1.51525	95			

Bartlett's Test

M/C = 5.657 df = 4 P = .226

Homogeneity of variance accepted.

DEPENDENT VARIABLE 14: Asking Yes/No Questions

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	0.02785	4	0.0069	0.69	0.59
Within groups	0.90618	91	0.0099		
Totals	0.93403	95			

Bartlett's Test

M/C = 3.968 df = 4 P = 0.410

Homogeneity of variance accepted.

DEPENDENT VARIABLE 15: Teacher Answers Own Question

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0064	4	.0016	3.36	.01
Within groups	.0434	91	.0004		
Totals	.0498	95			

Bartlett's Test

M/C = 42.779 df = 4 P = .001

Homogeneity of variance not accepted.

DEPENDENT VARIABLE 16: One Idea Pupil Responses

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.361997	4	.0904	4.08	.004
Within groups	2.016229	91	.0221		
Totals	2.378226	95			

Bartlett's Test

M/C = 5.071 df = 4 P = .280

Homogeneity of variance accepted.

DEPENDENT VARIABLE 17: Several Ideas Pupil Responses

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.1235	4	.0308	3.09	.01
Within groups	.9072	91	.0099		
Totals	1.0307	95			

Bartlett's Test

M/C = 2.683 df = 4 P = .61

Homogeneity of variance accepted.

DEPENDENT VARIABLE 18: Extended Ideas Pupil Responses

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0887589	4	.0221	3.29	.014
Within groups	.6133595	91	.0067		
Totals	.7021184	95			

Bartlett's Test

M/C = 31.589 df = 4 P = .001

Homogeneity of variance not accepted.

DEPENDENT VARIABLE 19: Coordinate-reactive Responding Patterns

Analysis of Variance

Source of Variation	SS	df	MS	F	P
Between groups	.0922	4	.0230	.65	.62
Within groups	3.2273	91	.0354		
Totals	3.3195	95			

Bartlett's Test

M/C = 1.554 df = 4 P = .817

Homogeneity of variance accepted.

F.2 Part 3 Research Design: Factorial ANOVAS on Pre-test Teaching Performance

DEPENDENT VARIABLE 1: Fluency-control

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0031	1	.0031	.35	.55
M (Media)	.0214	1	.0214	2.41	.12
Q (Question level)	.0066	1	.0066	.74	.39
P x M	.0033	1	.0033	.37	.54
P x Q	.0031	1	.0031	.35	.55
M x Q	.0094	1	.0094	1.06	.30
P x M x Q	.0001	1	.0001	.01	.91
Within groups	.3558	40	.0088		
Totals	.4028	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.04 df = 20,20, P = .91 Homogeneity of variance accepted.

Factor M: F = 1.03 df = 20,20, P = .93 Homogeneity of variance accepted.

Factor Q: F = 1.92 df = 20,20, P = .15 Homogeneity of variance accepted.

DEPENDENT VARIABLE 2: Cognitive Episode Control

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	5.3333	1	5.3333	.20	.65
M (Media)	33.3333	1	33.3333	1.27	.26
Q (Question level)	70.0833	1	70.0833	2.68	.10
P x M	.7500	1	.7500	.02	.86
P x Q	56.3333	1	56.3333	2.16	.14
M x Q	21.3333	1	21.3333	.81	.37
P x M x Q	10.0833	1	10.0833	.38	.53
Within groups	1042.6666	40	26.0666		
Totals	1239.9164	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.51 df = 20,20, P = .35 Homogeneity of variance accepted.

Factor M: F = 1.30 df = 20,20, P = .55 Homogeneity of variance accepted.

Factor Q: F = 1.70 df = 20,20, P = .23 Homogeneity of variance accepted.

DEPENDENT VARIABLE 3: Episode Sustaining Tendency

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.2041	1	.2041	.27	.60
M (Media)	.0011	1	.0011	.00	.96
Q (Question level)	1.8213	1	1.8213	2.42	.12
P x M	.1471	1	.1471	.19	.66
P x Q	1.3933	1	1.3933	1.85	.18
M x Q	.1552	1	.1552	.20	.65
P x M x Q	.4328	1	.4328	.57	.45
Within groups	30.0784	40	.7519		
Totals	34.2333	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.45 df = 20,20, P = .41 Homogeneity of variance accepted.

Factor M: F = 1.52 df = 20,20, P = .34 Homogeneity of variance accepted.

Factor Q: F = 1.62 df = 20,20, P = .28 Homogeneity of variance accepted.

DEPENDENT VARIABLE 4: Redirection Tendency

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0131	1	.0131	.99	.32
M (Media)	.0576	1	.0576	4.36	.04
Q (Question level)	.0283	1	.0283	2.14	.15
P x M	.0019	1	.0019	.14	.70
P x Q	.0037	1	.0037	.28	.59
M x Q	.0011	1	.0011	.09	.76
P x M x Q	.0000	1	.0000	.00	.94
Within groups	.5280	40	.0132		
Totals	.6337	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.07 df = 20,20, P = .88 Homogeneity of variance accepted.

Factor M: F = 3.99 df = 20,20, P = .00 Homogeneity of variance not accepted.

Factor Q: F = 2.07 df = 20,20, P = .11 Homogeneity of variance accepted.

DEPENDENT VARIABLE 5: Probing Tendency

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0005	1	.0005	.05	.82
M (Media)	.0641	1	.0641	5.85	.02
Q (Question level)	.0020	1	.0020	.19	.66
P x M	.0026	1	.0026	.24	.62
P x Q	.0152	1	.0152	1.38	.24
M x Q	.0023	1	.0023	.21	.64
P x M x Q	.0026	1	.0026	.24	.62
Within groups	.4382	40	.0109		
Totals	.5275	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.72	df = 20,20,	P = .23	Homogeneity of variance accepted.
Factor M:	F = 1.39	df = 20,20,	P = .46	Homogeneity of variance accepted.
Factor Q:	F = 1.37	df = 20,20,	P = .48	Homogeneity of variance accepted.

DEPENDENT VARIABLE 6: Tendency to Use Pupil Ideas

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0000	1	.0000	.01	.91
M (Media)	.0002	1	.0002	.24	.62
Q (Question level)	.0008	1	.0008	.85	.36
P x M	.0002	1	.0002	.21	.64
P x Q	.0005	1	.0005	.51	.47
M x Q	.0050	1	.0050	4.92	.03
P x M x Q	.0017	1	.0017	1.69	.20
Within groups	.0411	40	.0010		
Totals	.0495	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.51	df = 20,20,	P = .36	Homogeneity of variance accepted.
Factor M:	F = 1.68	df = 20,20,	P = .25	Homogeneity of variance accepted.
Factor Q:	F = 1.99	df = 20,20,	P = .13	Homogeneity of variance accepted.

DEPENDENT VARIABLE 7: Tendency to Use Structuring with Questions

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0086	1	.0086	1.49	.22
M (Media)	.0104	1	.0104	1.82	.18
Q (Question level)	.0000	1	.0000	.00	.99
P x M	.0118	1	.0118	2.05	.15
P x Q	.0000	1	.0000	.00	.97
M x Q	.0096	1	.0096	1.68	.20
P x M x Q	.0018	1	.0018	.32	.56
Within groups	.2299	40	.0057		
Totals	.2721	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.51	df = 20,20,	P = .35	Homogeneity of variance accepted.
Factor M:	F = 1.20	df = 20,20,	P = .68	Homogeneity of variance accepted.
Factor Q:	F = 1.28	df = 20,20,	P = .58	Homogeneity of variance accepted.

DEPENDENT VARIABLE 8: Asking Initial Questions of Low Order Cognitive Demand

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0040	1	.0040	.17	.67
M (Media)	.0012	1	.0012	.05	.81
Q (Question level)	.0427	1	.0427	1.83	.18
P x M	.0376	1	.0376	1.61	.21
P x Q	.0200	1	.0200	.86	.35
M x Q	.0055	1	.0055	.23	.62
P x M x Q	.0004	1	.0004	.01	.89
Within groups	.9319	40	.0232		
Totals	1.0433	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.74	df = 20,20,	P = .22	Homogeneity of variance accepted.
Factor M:	F = 1.71	df = 20,20,	P = .23	Homogeneity of variance accepted.
Factor Q:	F = 1.03	df = 20,20,	P = .93	Homogeneity of variance accepted.

DEPENDENT VARIABLE 9: Asking Initial Questions of Middle Order Cognitive Demand

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0146	1	.0146	.86	.35
M (Media)	.0005	1	.0005	.03	.85
Q (Question level)	.0921	1	.0921	5.46	.02
P x M	.0043	1	.0043	.25	.61
P x Q	.0423	1	.0423	2.50	.12
M x Q	.0035	1	.0035	.21	.64
P x M x Q	.0100	1	.0100	.59	.44
Within groups	.6744	40	.0168		
Totals	.8471	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.03	df = 20,20,	P = .94	Homogeneity of variance accepted.
Factor M:	F = 1.08	df = 20,20,	P = .85	Homogeneity of variance accepted.
Factor Q:	F = 1.35	df = 20,20,	P = .50	Homogeneity of variance accepted.

DEPENDENT VARIABLE 10: Asking Initial Question of High Order Cognitive Demand

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0032	1	.0032	.22	.63
M (Media)	.0034	1	.0034	.24	.62
Q (Question level)	.0094	1	.0094	.65	.42
P x M	.0165	1	.0165	1.15	.28
P x Q	.0041	1	.0041	.28	.59
M x Q	.0002	1	.0002	.01	.90
P x M x Q	.0145	1	.0145	1.01	.31
Within groups	.5720	40	.0143		
Totals	.6233	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 3.12	df = 20,20,	P = .01	Homogeneity of variance not accepted.
Factor M:	F = 2.22	df = 20,20,	P = .08	Homogeneity of variance accepted.
Factor Q:	F = 1.05	df = 20,20,	P = .91	Homogeneity of variance accepted.

DEPENDENT VARIABLE 11: Asking Probing Questions of High Order Cognitive Demand

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0037	1	.0037	.16	.68
M (Media)	.0438	1	.0438	1.97	.16
Q (Question level)	.0516	1	.0516	2.32	.13
P x M	.0448	1	.0448	2.01	.16
P x Q	.0017	1	.0017	.07	.78
M x Q	.0042	1	.0042	.19	.66
P x M x Q	.0678	1	.0678	3.05	.08
Within groups	.8891	40	.0222		
Totals	1.1067	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.31	df = 20,20,	P = .54	Homogeneity of variance accepted.
Factor M:	F = 1.04	df = 20,20,	P = .92	Homogeneity of variance accepted.
Factor Q:	F = 1.73	df = 20,20,	P = .22	Homogeneity of variance accepted.

DEPENDENT VARIABLE 12: Amount of Teacher Talk

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0186	1	.0186	1.02	.31
M (Media)	.0413	1	.0413	2.25	.14
Q (Question level)	.0268	1	.0268	1.46	.23
P x M	.0009	1	.0009	.05	.81
P x Q	.0454	1	.0454	2.48	.12
M x Q	.0401	1	.0401	2.19	.14
P x M x Q	.0172	1	.0172	.94	.33
Within groups	.7322	40	.0183		
Totals	.9255	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P:	F = 1.33	df = 20,20,	P = .51	Homogeneity of variance accepted.
Factor M:	F = 1.04	df = 20,20,	P = .91	Homogeneity of variance accepted.
Factor Q:	F = 1.41	df = 20, 20,	P = .44	Homogeneity of variance accepted.

DEPENDENT VARIABLE 13: Teacher Repetition of Pupil Responses

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0001	1	.0001	.00	.92
M (Media)	.0925	1	.0925	7.45	.009
Q (Question level)	.0003	1	.0003	.02	.87
P x M	.0005	1	.0005	.04	.83
P x Q	.0099	1	.0099	.79	.37
M x Q	.0054	1	.0054	.43	.51
P x M x Q	.0207	1	.0207	1.67	.20
Within groups	.4968	40	.0124		
Totals	.6262	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.44 df = 20,20, P = .41 Homogeneity of variance accepted.

Factor M: F = 2.43 df = 20,20, P = .05 Homogeneity of variance not accepted.

Factor Q: F = 1.02 df = 20,20, P = .96 Homogeneity of variance accepted.

DEPENDENT VARIABLE 14: Asking Yes/ No Questions

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0186	1	.0186	1.96	.16
M (Media)	.0055	1	.0055	.58	.44
Q (Question level)	.0263	1	.0263	2.76	.10
P x M	.0013	1	.0013	.14	.70
P x Q	.0152	1	.0152	1.60	.21
M x Q	.0018	1	.0018	.19	.66
P x M x Q	.0030	1	.0030	.32	.57
Within groups	.3803	40	.0095		
Totals	.4520	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.94 df = 20,20, P = .14 Homogeneity of variance accepted.

Factor M: F = 1.76 df = 20,20, P = .21 Homogeneity of variance accepted.

Factor Q: F = 1.07 df = 20,20, P = .86 Homogeneity of variance accepted.

DEPENDENT VARIABLE 15: Teacher Answers Own Question

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0002	1	.0002	.44	.50
M (Media)	.0055	1	.0055	8.72	.005
Q (Question level)	.0009	1	.0009	1.56	.21
P x M	.0000	1	.0000	.00	.93
P x Q	.0028	1	.0028	4.52	.03
M x Q	.0000	1	.0000	.01	.90
P x M x Q	.0030	1	.0030	4.87	.03
Within groups	.0252	40	.0006		
Totals	.0376	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.43 df = 20,20, P = .42 Homogeneity of variance accepted.

Factor M: F = 10.57 df = 20,20, P = .00 Homogeneity of variance not accepted.

Factor Q: F = 1.33 df = 20,20, P = .52 Homogeneity of variance accepted.

DEPENDENT VARIABLE 16: One Idea Pupil Responses

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0813	1	.0813	4.16	.04
M (Media)	.0795	1	.0795	4.07	.05
Q (Question level)	.0708	1	.0708	3.62	.06
P x M	.0001	1	.0001	.00	.92
P x Q	.0009	1	.0009	.04	.82
M x Q	.0077	1	.0077	.39	.53
P x M x Q	.0000	1	.0000	.00	.95
Within groups	.7809	40	.0195		
Totals	1.0212	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.59 df = 20,20, P = .30 Homogeneity of variance accepted.

Factor M: F = 1.60 df = 20,20, P = .29 Homogeneity of variance accepted.

Factor Q: F = 1.58 df = 20,20, P = .30 Homogeneity of variance accepted.

DEPENDENT VARIABLE 17 : Several Ideas Pupil Responses

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0126	1	.0126	1.48	.23
M (Media)	.0120	1	.0120	1.41	.24
Q (Question level)	.0052	1	.0052	.61	.43
P x M	.0019	1	.0019	.22	.63
P x Q	.0011	1	.0011	.13	.71
M x Q	.0009	1	.0009	.11	.73
P x M x Q	.0044	1	.0044	.52	.47
Within groups	.3408	40	.0085		
Totals	.3789	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.05 df = 20,20, P = .90 Homogeneity of variance accepted.

Factor M: F = 1.25 df = 20,20 P = .62 Homogeneity of variance accepted.

Factor Q: F = 1.01 df = 20,20, P = .96 Homogeneity of variance accepted.

DEPENDENT VARIABLE 18: Extended Ideas Pupil Responses

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0316	1	.0316	5.07	.02
M (Media)	.0312	1	.0312	5.00	.03
Q (Question level)	.0353	1	.0353	5.66	.02
P x M	.0027	1	.0027	.43	.51
P x Q	.0048	1	.0048	.77	.38
M x Q	.0153	1	.0153	2.46	.12
P x M x Q	.0049	1	.0049	.79	.37
Within groups	.2498	40	.0062		
Totals	.3756	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 3.57 df = 20,20, P = .006 Homogeneity of variance not accepted.

Factor M: F = 4.13 df = 20,20, P = .002 Homogeneity of variance not accepted.

Factor Q: F = 2.75 df = 20,20, P = .028 Homogeneity of variance not accepted.

DEPENDENT VARIABLE 19: Coordinate-reactive Responding Patterns

Factorial Analysis of Variance

Source of Variation	SS	df	MS	F	P
P (Pupils)	.0778	1	.0778	2.08	.15
M (Media)	.0040	1	.0040	.10	.74
Q (Question level)	.0252	1	.0252	.67	.41
P x M	.0047	1	.0047	.12	.72
P x Q	.0063	1	.0063	.16	.68
M x Q	.0250	1	.0250	.67	.41
P x M x Q	.0282	1	.0282	.75	.38
Within groups	1.4900	40	.0372		
Totals	1.6612	47			

Variance Ratio Test for Heterogeneity of Variance

Factor P: F = 1.06 df = 20,20, P = .88 Homogeneity of variance accepted.

Factor M: F = 1.45 df = 20,20, P = .41 Homogeneity of variance accepted.

Factor Q: F = 1.23 df = 20,20, P = .63 Homogeneity of variance accepted.

REFERENCES

ACHESON, K.A. (1964). The Effects of Feedback from Television Recordings and Three Types of Supervisory Treatment on Selected Teaching Behaviors. Unpublished Doctoral disseration, Stanford School of Education, Stanford University. In ACHESON, K.A. (1971). Literature Review: Audiotape and Videotape Feedback. Report No. A71-24, Far West Laboratory for Educational Research and Development.

ACHESON, K.A. and TUCKER, P.E. (1971). Videotape versus Written Instruction and Videotape versus Audiotape Feedback in a Minicourse on Higher Cognitive Questioning. Report No. A71-18, Far West Laboratory for Educational Research and Development.

ACHESON, K.A. and ZIGLER, C.J. (1971). A Comparison of Two Teacher Training Programs in Higher Cognitive Questioning. Report No. A71-19, Teacher Education Division Publication Series, Far West Laboratory for Educational Research and Development.

ADAIR, C.H. and KYLE, A.R. (1969). Effects of Feedback on Teacher Behavior: An Exploration into the use of Videotaping in Teacher Education Programs. Atlanta, Georgia: Southeastern Education Laboratory. In ACHESON, K.A. (1971). Literature Review: Audiotape and Videotape Feedback. Report No. A71-24, Far West Laboratory for Educational Research and Development.

ALLAN, J.S. (1967). Primary Teacher Training. Education, 5, 16, 3-9.

ALLEN, D.W. and FORTUNE, J.C. (1966). An Analysis of Microteaching: A New Procedure in Teacher Education. Stanford University, School of Education (mimeo.).

ALLEN, D.W. *et al.*, (1967). A Comparison of Different Modeling Procedures in the Acquisition of a Teaching Skill. Paper presented at the Annual Meeting of the American Educational Research Association.

ALLEN, D.W., FORTUNE, J.C. and COOPER, J.M. (1968). The Stanford Summer Microteaching Clinic 1966. In Microteaching: A Description (mimeo.), Stanford Teacher Education Program, Stanford University.

ALLEN, D.W. and RYAN, K. (1969). Microteaching. Palo Alto, California: Adison-Wesley.

ALLEN, D.W., RYAN, K., BUSH, R.N. and COOPER, J. (1969). Teaching Skills for Elementary and Secondary School Teachers. General Learning Corporation.

ALLEN, P.M. *et al.*, (1970). Teacher Self-Appraisal: A Way of Looking Over Your Own Shoulder. Chas. A. Jones Publishing Company, Ohio.

AMIDON, E., AMIDON, P. and ROSENSHINE, B. (1969). SKIT (Skill Development in Teaching): Work Manual. Minneapolis: Assn. for Productive Teaching.

AMIDON, E.J. and HOUGH, J.B. (eds.) (1967). Interaction Analysis: Theory, Research and Application. Reading, Mass.: Addison-Wesley.

AMIDON, E.J. and POWELL, E. (1966). Interaction Analysis of a Feedback System in Teacher Preparation. In RATHS, J. and LEEPER, R. (eds.), The Supervisor: Agent for Change. Washington, D.C.: ASCD.

ANGELL, D. and LUMSDAINE, A.A. (1961). The Effects of Prompting Trials and Partial-Correction Procedures on Learning by Anticipation. In COULSON, J.E. (ed.), Programmed Learning and Computer-Based Instruction. New York: Wiley.

ANNETT, J. (1969). Feedback and Human Behaviour. Penguin Science Behaviour, Penguin Books.

BAKER, H.P. (1970). Film and Videotape Feedback: A Review of the Literature. Report Series No.53, The Research and Development Center for Teacher Education, The University of Texas at Austin.

BANDURA, A., ROSS, D. and ROSS, S.A. (1961). Transmission of Aggression Through Imitation of Aggressive Models. Journal of Abnormal and Social Psychology, 63, 575-582.

BANDURA, A. and WALTERS, R.H. (1963). Social Learning and Personality Development. New York: Holt, Rinehart and Winston.

BEATTIE, N.M. and TEATHER, D.C. Towards a Taxonomy of Microteaching Situations: Implications and Issues (University of Liverpool). Paper presented at the International Microteaching Symposium, Tübingen, West Germany, 1972.

BEDICS, R.A. and WEBB, J.N. (1971). Measuring the Self-evaluation of Teaching Behavior through the Use of Videotape. ED 051 079.

BELLACK, A.A., KLIEBARD, H.M., HYMAN, R.T. and SMITH, F.L. (1966). The Language of the Classroom. Teachers College Press.

BELT, W.D. (1967). Microteaching: Observed and Critiqued by a Group of Trainees. Department of Teacher Education, Brigham Young University.

BERLINER, D.C. (1969). Microteaching and the Technical Skills Approach to Teacher Training. Technical Report No.8, Stanford Center for Research and Development in Teaching, Stanford University.

BJERSTEDT, A. (1967). CCTV and Video-recordings as "Observation Amplifiers" in Teacher Training. Educational Television International, 1, 300-12.

BLOOM, J.M. (1969). Videotape and the Vitalisation of Teaching. The Journal of Teacher Education, 20, 311-15.

BLOOM, B.S., ENGELHART, M.D., FURST, E.J., HILL, W.H. and KRATHWOHL, D.R. (eds.), (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I : Cognitive Domain. New York: David McKay.

BOONE, D.R. and STECH, E.L. (1970). Development of Clinical Skills in Speech Pathology by Videotape and Audiotape Self-Confrontation. ERIC ED 042 366.

BORG, W.R. (1970). The Minicourse: A Microteaching Approach to Teacher Education. Far West Laboratory for Educational Research and Development. Macmillan Educational Services, Inc., California.

BORG, W.R. (1972). The Minicourse as a Vehicle for Changing Teacher Behavior. Journal of Educational Psychology, 63, 6, 572-579.

BORG, W.R., KALLENBACH, W.W., KELLEY, M.L. and LANGER, P. (1968). The Minicourse: Rationale and Uses in the Inservice Education of Teachers. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.

BORG, W.R., KALLENBACH, W.W., MORRIS, M. and FRIEBEL, A. (1969). Videotape Feedback and Microteaching in a Teacher Training Model. The Journal of Experimental Education, 37, 9-16.

BORG, W.R. *et al.*, (1970). A Microteaching Approach to Teacher Education. Collier Macmillan, London.

BROWN, G.A. (1971). Microteaching: Innovation in Teacher Education. Education for Teaching, 86, 11-15.

BROWN, G.A. (1975). Some Case Studies for Teacher Preparation. British Journal of Teacher Education, 1, 71-85.

BRUSLING, C. and TINGSELL, J. (1973). Self-observation and Self-analysis in Teacher Training. Gothenburg, Sweden: Gothenburg School of Education, Department of Educational Research (Mimeo).

BUSH, R.N. (1966). Microteaching: Controlled Practice in the Training of Teachers. Communication, 48, 201-07.

BUSH, R.N. *et al.*, (1964). Microteaching: A Description. California: Stanford University.

BUTCHER, R.H. and HEAPS, R.A. (1973). Predicting Teacher Effectiveness. ERIC: ED 074 046.

CAPPELLUZZO, E.M. and BRINE, J. (1969). Dogmatism and Prospective Teachers. The Journal of Teacher Education, 20, 2, 148-152.

CHAVERS, K., VAN MONDFRANS, A.P. and FELDHUSEN, J.F. (1970). Analysis of the Interaction of Student Characteristics with Method in Microteaching. ED 037 389.

CLARK, R.J. and ALLEN, D.W. (1967). Microteaching: Its Rationale. High School Journal, 51, 75-79.

CLAUS, K.E. (1969). Effects of Modelling and Feedback Treatments on the Development of Teachers' Questioning Skills. Technical Report No.6, Stanford Center for Research and Development in Teaching, Stanford University.

CLIFT, J.C., BATTEN, H.D., BURKE, G. and MALLEY, J.I. (1974). A Cost Effectiveness Study of the Use of Microteaching in the Education of Teachers. National Library of Australia: ISBN 0 909931 06 2.

COHEN, L. (1971). Dogmatism and Views of the 'Ideal Pupil'. Educational Review, 24, 1, 3-10.

COLLEFELLO, P. *et al.*, (n.d.). The Relative Effectiveness of Two Sources of Feedback on Teachers in the Microteaching Situation. Minnesota Research Coordinating Unit in Occupational Education, Minneapolis. ERIC: ED 044.

COMBS, A.W. (1965). The Professional Education of Teachers: A Perceptual View of Teacher Education. Boston: Allyn and Bacon.

COMBS, A.W. (1972). Some Basic Concepts for Teacher Education. The Journal of Teacher Education, 23, 3, 286-290.

COMMISSION ON EDUCATION (1962). Report of the Commission on Education in New Zealand. R.E. Owen, Government Printer, Wellington, New Zealand.

CONSULTATIVE COMMITTEE REPORT (1951). Recruitment, Education and Training of Teachers. New Zealand Department of Education Publication, Wellington, New Zealand.

COOLEY, W.W. and LOHNES, P.R. (1971). Multivariate Data Analysis. Wiley.

COOPER, J.M. (1967). Developing Specific Teaching Skills through Microteaching. High School Journal, 51, 80-85.

COOPER, J.M. and ALLEN, D.W. (1970). Microteaching: History and Present Status. ED 036 471.

COOPER, J.M. and STROUD, T. (1966). The Stanford Summer Microteaching Clinic. In Microteaching: A Description (Mimeo.). Stanford School of Education, Stanford University.

CRONBACH, L.J. and FURBY, L. (1970). How We Should Measure "Change" — Or Should We? Psychological Bulletin, 74, 1, 68-80.

DAVIS, A.R. (1971). Microteaching in a Small Liberal Arts College. Audiovisual Instruction, 16, 3, 81-2.

DAVIS, O.L., Jr. and SMOOT, B.R. (1970). Effects on the Verbal Teaching Behaviors of Beginning Secondary Teacher Candidates' Participations in a Program of Laboratory Teaching. Educational Leadership (Research Supplement), 28, 165-9.

DEWEY, J. (1937). Experience and Education. New York: Scribners.

DIXON, P. (1973). BMD12V Computer Programme for MANOVA. Dept. of Management Studies, University of Waikato, New Zealand.

DOTY, C.R. (1970). Establishing the Foundation for Field Testing. In CAMERON, W.A. and COTRELL, C.J. (eds.), Assessment of Microteaching and Video Recording in Vocational and Technical Teacher Education: Phase X — Interim Report. Research and Development Series No.40, Columbus Center for Vocational and Technical Education, 47-64.

DUGAS, D.G. (1967). Microteaching: A Promising Medium for Teacher Re-training. The Modern Language Journal, 51, 161-6.

DUNKIN, M.J. (1976). Problems in the Accumulation of Process-Product Evidence in Classroom Research. British Journal of Teacher Education, 2, 2, 175-183.

DUNKIN, M.J. and BIDDLE, B.J. (1974). The Study of Teaching. Holt, Rinehart and Winston, Inc.

EBERT, M.J. (1969). The Effect of Modeling and Feedback on the Learning of Questioning Behaviors by Teacher Candidates in Nursing Utilizing a Microteaching Practice Setting. Unpublished doctoral dissertation, University of California. Dissertation Abstracts International, 31/A/5244-5.

EDER, M.D. (1971). A Study of the Effectiveness of the Videotape Recorder With and Without Modeling in the Inservice Training of Teachers. University of Maryland. ERIC: ED 053 547.

EDWARDS, A.L. (1957). Techniques of Attitude Scale Construction. New York: Appleton-Century-Crofts.

EMMER, E.T. (1971). Transfer of Instructional Behavior and Performance Acquired in Simulated Teaching. Journal of Educational Research, 65, 4, 178-183.

EMMER, E.T. and MILLETT, B.G. (1968). An Assessment of Terminal Performance in a Teaching Laboratory: A Pilot Study. Research and Development Center for Teacher Education, The University of Texas at Austin (mimeo.).

EMMER, E.T. and MILLETT, G.B. (1970). Improving Teaching Through Experimentation. Prentice-Hall Inc., Englewood Cliffs.

EMMER, E.T. and SULLIVAN, E.H. (1969). An Evaluation of a Video Tape Modeling Module: Motivating Strategies. Report Series No.30, The Research and Development Center for Teacher Education, The University of Texas at Austin.

FESTINGER, L. (1957). A Theory of Cognitive Dissonance. Row, Peterson.

FLANDERS, N.A. (1960). The Problems of Observer Training and Reliability. In AMIDON, E.J. and HOUGH, J.B. (eds.)(1967), Interaction Analysis: Theory, Research and Application. Addison-Wesley.

FLANDERS, N.A. (1970). Analyzing Teaching Behavior. Addison-Wesley.

FLANDERS, N.A. (1976). Research on Teaching and Improving Teacher Education. British Journal of Teacher Education, 2, 2, 167-174.

FORTUNE, J.C., COOPER, J.M. and ALLEN, D.W. (1967). The Stanford Summer Micro-teaching Clinic, 1965. The Journal of Teacher Education, 18, 4, 389-93.

FOSTER, J.K., HEYS, T.A. and HARVEY, J.M. (1973). Microteaching: A Review and a Study of the Effect of Microteaching on Teaching Effectiveness as Measured by Pupil Achievement. The Forum of Education, 32, 2, 100-141.

FOXHALL, A. and EVANS, T. (1973). Closed-circuit Television in Training for Teaching in Further Educational Institutions. Programmed Learning and Educational Technology, 10, 3, 170-180.

FREYBERG, P.S. (1977). Report on Study Leave to the Council of the University of Waikato, Hamilton, New Zealand.

FREYBERG, P.S. and KATTERNS, R.W. (1971). Increasing Teacher Sensitivity Using Interaction Analysis. Classroom Interaction Newsletter, 7, 25-29.

FREYBERG, P.S., KATTERNS, R.W. and ROGERS, B.R. (1974). The Vicarious Learning of Skills in a Microteaching Programme. Teacher Education Research Project, Report No.1, Occasional Papers in Education No.3. University of Waikato, Hamilton, New Zealand.

FRIEBEL, A.C. and KALLENBACH, W.W. (1969). Effects of Video Tape Feedback and Microteaching as Developed in the Field Test of Minicourse I with Student Teachers. Paper presented at the Annual Convention of the California Educational Research Association.

FULLER, F.F. and MANNING, B.A. (1973). Self-confrontation Reviewed: A Conceptualization for Video Playback in Teacher Education. Review of Educational Research, 43, 4, 469-528.

GAGE, N.L. (1963). Paradigms for Research on Teaching. In GAGE, N.L. (ed.), Handbook of Research on Teaching. Rand McNally.

GAGE, N.L. (1968). An Analytical Approach to Research on Instructional Methods. Phi Delta Kappan, 49, 601-16.

GAGE, N.L. (1972). Teacher Effectiveness and Teacher Education: The Search for a Scientific Basis. California: Pacific Books.

GALL, M.D. (1973). The Problem of "Student Achievement" in Research on Teacher Effects. Paper presented at the Annual Meeting of the American Educational Research Association.

GALL, M., DELL, H., DUNNING, B. and GALASSI, J. (1971). Improving Teachers' Mathematics Tutoring Skills Through Microteaching: A Comparison of Videotape and Audiotape Feedback. Paper presented at the Annual Meeting of the American Educational Research Association.

GALL, M.D. *et al.*, (1972). Comparison of Instructional Media in a Minicourse on Higher Cognitive Questioning. Paper presented at the Annual Meeting of the American Educational Research Association.

GODDU, R.J.B. and DURCHAME, E.R. (1971). A Responsive Teacher Education Programme. Teachers College Record, 72, 3, 432-41.

GOLDMAN, B.A. (1969). Effect of Classroom Experience and Videotape Self-observation upon Undergraduate Attitudes Towards Self and Towards Teaching. Proceedings of the 77th Annual Convention of the American Psychological Association. ERIC ED: 038 359.

GOLDTHWAITE, D.T. (1969). A Study of Microteaching in the Pre-service Education of Science Teachers. Dissertation Abstracts, 29, 3021A.

GOODKIND, T.B. (1968). An Evaluation of the Effectiveness of the Micro-teaching Technique in the Training of Elementary School Teachers. Paper presented at the Annual Meeting of the American Educational Research Association.

GOODLAD, J.I. (1972). The Reconstruction of Teacher Education. Teachers College Record, 73, 3, 61-72.

GREENE, M. (1973). Teacher as Stranger. New York: Bureau of Publications, Teachers College, Columbia University.

GREGG, D.B. (1971). Keys to Effective Behavior. The Journal of of Teacher Education, 22, 4, 464-68.

GREGORY, I.D. (1971). Microteaching in a Pre-service Education Course for Graduates. British Journal of Educational Technology, 1, 2, 24-32.

GREGORY, T.B. (1972). Encounters with Teaching: A Microteaching Manual. Prentice-Hall.

GRIFFITHS, R. (1972). The Role of the Tutor in Microteaching Supervision: A Survey of Research Evidence. Department of Education, University of Stirling, Scotland.

GUELCHER, W., JACKSON, T. and NECHELES, F. (1970). Microteaching and Teacher Training — A Refined Version. Occasional Paper No.1, Teacher Education Center, University of Chicago, Chicago, Illinois. ERIC ED: 050 017.

HANNY, R.J. (1967). The Relationship between Selected Personality Characteristics and Teacher Verbal Behavior. Classroom Interaction Newsletter, 2, 2, 26.

HARRINGTON, F. (1970). Feedback Techniques for Inservice Technical Teacher Education. In CAMERON, W.A. and COTRELL, C.J. (eds.), Assessment of Micro-teaching and Video Recording in Vocational and Technical Teacher Education: Phase X — Interim Report. Research and Development Series No.40, Columbus Center for Vocational and Technical Education, August, 81-88.

HARRIS, W.N., LEE, V.W. and PIGGE, F.L. (1970). Effectiveness of Micro-teaching Experiences in Elementary Science Methods Classes. Journal of Research in Science Teaching, 7, 1, 31-3.

HAYS, W.L. (1973). Statistics for the Social Sciences (2nd Edition). Holt, Rinehart and Winston.

HEATH, R.W. and NIELSON, M.A. (1973). The Myth of Performance-based Teacher Education. Paper presented at the Annual Meeting of the American Educational Research Association.

HIGGINS, W.H., IVEY, A.E. and UHLEMANN, M.R. (1970). Media Therapy: A Programmed Approach to Teaching Behavioral Skills. Journal of Counseling Psychology, 17, 20-6.

HISCOX, S.B. and VAN MONDFRANS, A.P. (1972). Feedback Conditions and Type of Teaching Skill in Microteaching. Paper presented at the Annual Meeting of the American Educational Research Association.

HOERNER, J. (1973). An Assessment of Microteaching as a Means of Improving the Effectiveness of the Pre-service Trade and Industrial Teacher Education Workshop. Unpublished doctoral dissertation, Ohio State University, 1969. In VAN MONDFRANS, A.P. and HISCOX, S.B., Microteaching: Variations of the Model. Paper presented at the Annual Meeting of the American Educational Research Association. ERIC ED: 039 318.

HOUGH, J.B. and AMIDON, E.J. (1964). Behavioral Changes in Pre-Service Teacher Preparation. Philadelphia: College of Education, Temple University.

HOUGH, J.B. and AMIDON, E.J. (1965). The Relationship of Personality Structure and Training in Interaction Analysis to Attitude Change during Student Teaching. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.

HOUGH, J.B., LOHMAN, E.E. and OBER, R. (1969). Shaping and Predicting Verbal Teaching Behavior in a General Methods Course. The Journal of Teacher Education, 20, 2, 213-224.

HUGHES, K.A. (1969). The Effect of Microteaching and Student Teaching on Scales of Dogmatism, Anxiety and Attitudes of Prospective Elementary Teachers. Unpublished doctoral dissertation, University of South Dakota. Dissertation Abstracts International, 30/A/3831-2.

JENSEN, P.H. (1968). A Study of Self-evaluation Applied to In-service Education Including an Annotated Bibliography. Teaching Research Division, Oregon State System of Higher Education, Monmouth, Oregon.

JENSEN, L.C. and YOUNG, J.I. (1972). Effect of Televised Simulated Instruction on Subsequent Teaching. Journal of Educational Psychology, 63, 4, 368-73.

JOHNSON, J.S. (1969). Change in Student Teacher Dogmatism. The Journal of Educational Research, 62, 5, 224-26.

JOHNSON, W. and KNAUPP, J. (1970). Trainee Role Expectations of the Microteaching Supervisor. The Journal of Teacher Education, 21, 3, 396-401.

JOHNSON, W.D. and PANCRAZIO, S.B. (1971). The Effectiveness of Three Microteaching Environments in Preparing Undergraduates for Student Teaching. Paper presented at the Annual Meeting of the American Educational Research Association. ERIC ED: 051 098.

JOHNSTON, D.B. (1969). The Relationship of Self-supervision to Change in Selected Attitudes and Behavior of Secondary Student Teachers. Paper presented at the Annual Meeting of the American Educational Research Association.

JOHNSTON, W.W. (1967). Dogmatism as a Means of Predicting Insecurity, Self-concept, Meaning, Attitude, and Effectiveness of Female Elementary Teachers. Ed.D. dissertation, University of South Dakota. In COHEN, L. (1971). Dogmatism and Views of the Ideal Pupil. Educational Review, 24, 1, 3-10.

JOYCE, B.R. (1967). Flexibility in Teacher Behavior. Classroom Interaction Newsletter, 2, 2, 5-11.

JOYCE, B.R. (n.d.). Listening to Different Drummers: The Effects of Teaching on Learners. Booksend Laboratories publication.

JOYCE, B.R. (1975). Conceptions of Man and Their Implications for Teacher Education. In Teacher Education: 74th Yearbook of the National Society for the Study of Education, Part 2. University of Chicago Press.

JOYCE, B.R. and WEIL, M. (1972). Models of Teaching. Englewood Cliffs: Prentice-Hall.

JOYCE, B.R. and WEIL, M. (1973). The Teacher-Innovator: Models of Teaching as the Core of Teacher Education. Interchange, 4, 2-3, 47-60.

KALLENBACH, W.W. and GALL, M.D. (1969). Microteaching Versus Conventional Methods of Training Elementary Intern Teachers. The Journal of Educational Research, 63, 3, 136-41.

KATTERNS, R.W. (1974). Manual: The SQUAIES Interaction Analysis Coding System. Teacher Education Research Project, University of Waikato, Hamilton, New Zealand (unpublished).

KERLINGER, F.N. (1966). Foundations of Behavioral Research. Holt, Rinehart and Winston.

KISSOCK, C. (1971). A study to Test the Value of Microteaching in a Program of Video Modeling Instruction in the Development of Higher Order Question Asking on the Part of Pre-service Teachers. Ph.D. thesis, University of Minnesota.

KLINGSTEDT, J.L. (1970). Effectiveness of Three Micro-teaching Feedback Procedures. Unpublished doctoral dissertation, Technical University, Texas. Dissertation Abstracts International, 31/A/5250.

KOHN, D.A. (1970). Videotaping Large Numbers of Prospective Student Teachers. Can It Be Effectively Accomplished? Audiovisual Instruction, 15, 105-7.

KORAN, J.J., Jr. (1968). The Relative Effects of Imitation Versus Problem Solving on the Acquisition of a Complex Teaching Skill. Unpublished doctoral dissertation, Stanford University. Dissertation Abstracts International, 29/A/500.

KORAN, J.J.,Jr. (1969). The Relative Effects of Classroom Instruction and Subsequent Observational Learning on the Acquisition of Questioning Behavior by Pre-service Elementary Science Teachers. Journal of Research in Science Teaching, 6, 217-23.

KORAN, J.J., Jr. (1970). The Relative Effects of Imitation Versus Problem Solving on the Acquisition of Inquiry Behavior by Intern Teachers. Technical Report No.11, Stanford Center for Research and Development in Teaching, Stanford, California.

KORAN, J.J., Jr. (1971). A Study of the Effects of Written and Film-mediated Models on the Acquisition of a Science Teaching Skill by Preservice Elementary Teachers. Journal of Research in Science Teaching, 8, 1, 45-50.

KORAN, J.J., Jr., KORAN, M.L. and McDONALD, F.J. (1972). Effects of Different Sources of Positive and Negative Information on Observational Learning of a Teaching Skill. Journal of Educational Psychology, 63, 5, 405-10.

KORAN, M.L. (1969). The Effects of Individual Differences on Observational Learning in the Acquisition of a Teaching Skill. Unpublished doctoral dissertation, Stanford University. Dissertation Abstracts International, 30/A/1450-1.

KRATHWOHL, D.R., BLOOM, B.S. and MASIA, B.B. (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook II : Affective Domain. New York, David McKay.

LA GRONE, H. (1964). A Proposal for the Revision of the Pre-service Professional Program of Teacher Education. Washington, D.C.: American Association of Colleges for Teacher Education.

LANGE, D.N. (1971). An Application of Social Learning Theory in Affecting Change in a Group of Student Teachers using Video Modeling Techniques. Journal of Educational Research, 65, 4, 151-4.

LANGER, P. (1971). Effects of Prior Experiences on Teacher Videotaped Performance. Report A71-10, Far West Laboratory for Educational Research and Development, California.

LEGGE, W.B. and ASPER, L. (1972). The Effect of Videotaped Microteaching Lessons on the Evaluative Behavior of Pre-student-teachers. The Journal of Teacher Education, 23, 3, 363-6.

LEVIS, D. *et al.*, (1973). A Progress Report of the Study to Investigate the Effects of Alternative Techniques to Practice Teaching on the Development of Teaching Skills by Student Teachers. School of Education, MacQuarie University, Sydney.

LIMBACHER, P.C. (1971). A Study of the Effects of Microteaching Experiences upon the Classroom Behavior of Social Studies Student Teachers. Paper presented at the Annual Meeting of the American Educational Research Association. ERIC ED: 046 855.

LINN, R.L. and SLINDE, J.A. (1977). The Determination of the Significance of Change Between Pre- and Posttesting Periods. Review of Educational Research, 47, 1, 121-150.

LORD, R.M. (1963). Elementary Models for Measuring Change. In HARRIS, C.W., Problems in Measuring Change. University of Wisconsin Press.

MANNING, W.H. and DUBOIS, P.H. (1962). Correlational Method in Research on Human Learning. Perceptual and Motor Skills, 15, 287-321.

McCLOSKY, M.G. (ed.) (1971). Teaching Strategies and Classroom Realities. Prentice-Hall.

McDONALD, F.J. (1973). A Behavior Modification View of Video Playback: Microteaching. Paper presented at the Annual Meeting of the American Educational Research Association.

McDONALD, F.J. and ALLEN, D.W. (1967). Training Effects of Feedback and Modelling Procedures on Teaching Performance. Technical Report No.3, Stanford Center for Research and Development in Teaching, Stanford University.

McINTYRE, D. (n.d.). Cited in ST. JOHN-BROOKS, C. and SPELMAN, B. (n.d.), Microteaching. New University of Ulster.

McINTYRE, D. (1972). Three Approaches to Microteaching: An Experimental Comparison. Department of Education, University of Stirling, Scotland (mimeo.).

McINTYRE, D. and DUTHIE, J. (1972). Students' Reactions to Microteaching. Department of Education, University of Stirling, Scotland (mimeo.).

McKNIGHT, P. (1971). Microteaching in Teacher Training — A Review of Research. Research in Education, 6, 24-37.

McNAMARA, D.R. (1973). Socialisation into an Occupational Role: Some Aspects of the Case of Female Students Training to be Teachers in a College of Education. Unpublished Ph.D. thesis, University of Lancaster. Cited in MACNAMARA, David (1976), On Returning to the Chalk Face: Theory Not into Practice. British Journal of Teacher Education, 2, 2, 147-160.

MEICHENBAUM, D. (1971). Examination of Model Characteristics in Reducing Avoidance. Journal of Personality and Social Psychology, 17, 298-307.

MEIER, J.H. (1969). Long Distance Microtraining. Paper presented at the Annual Meeting of the American Psychological Association, Washington, D.C.

MORINE, G. (1974). Interaction Analysis and Inquiry: Teaching Skills Seen Through a Double Screen. Classroom Interaction Newsletter, 10, 1, 13-24.

MORRISON, A. and McINTYRE, D. (1969). Teachers and Teaching. Penguin.

MORSE, K.R. and DAVIS, O.L. (1970). The Effectiveness of Teaching Laboratory Instruction on the Questioning Behaviors of Beginning Teacher Candidates. R & D Report Series No.43. Austin, Texas: The Research and Development Center for Teacher Education, The University of Texas at Austin.

MORSE, K.R., MARCELLA, K.L. and DAVIS, O.L., Jr. (1970). Effects of Different Types of Supervisory Feedback on Teacher Candidates' Development of Refocusing Behaviors. Report Series No.48, Research and Development Center for Teacher Education, The University of Texas at Austin.

MUSELLA, D. (1969). Perceptual-cognitive Style as Related to Self-evaluation and Supervisor Rating by Student Teachers. The Journal of Experimental Education, 37, 51-55.

MYRICK, R.D. (1969). Effect of a Model on Verbal Behavior in Counseling. Journal of Counseling Psychology, 16, 185-190.

NASH, R.J. and AGNE, R.M. (1971). Competency in Teacher Education: A Prop for the Status Quo? The Journal of Teacher Education, 22, 2, 147-156.

NIE, N.H., HULL, C.H., JENKINS, J.G., STEINBRENNER, K. and BENT, P.H. (1975). SPSS: Statistical Package for the Social Sciences. McGraw-Hill.

NUTHALL, G. (1970). System of Analysis of Verbal Interaction in Class Lessons, 1970 Revision. Christchurch, New Zealand: University of Canterbury Teaching Research Project.

NUTHALL, G. and CHURCH, J. (1973). Experimental Studies of Teaching Behaviour. In CHANAN, G. (ed.), Towards a Science of Teaching. London: National Foundation for Educational Research.

OBER, R.L. (1967). Predicting Student Teacher Verbal Behavior. Classroom Interaction Newsletter, 2, 2, 39-40.

O'CONNOR, E.F. (1972). Test Theory and Measurement of Change. Review of Educational Research, 42, 1, 73-91.

OLIVERO, J.L. (1970). Microteaching: Medium for Improving Instruction. Ohio: Chas. E. Merrill.

ORME, M.E.J. (1966). The Effects of Modeling and Feedback Variables on the Acquisition of a Complex Teaching Strategy. Unpublished doctoral dissertation, Stanford University.

ORME, M.E.J., McDONALD, F.J. and ALLEN, D.W. (1966). The Effects of Modeling and Feedback Variables on the Acquisition of a Complex Teaching Strategy. Unpublished Research Report, Stanford University. In ACHESON, K.A. (1971). Literature Review: Audiotape and Videotape Feedback. Report No. A71-24, Far West Laboratory for Educational Research and Development.

PATRICK, J.M. (1972). Microteaching in a Simulated Classroom Situation. Educational Research Newsletter, 5,(n.p.), Department of Education, University of Canterbury, New Zealand.

PECK, R.F. and TUCKER, J.A. (1973). Research on Teacher Education. In TRAVERS, R.W., Second Handbook of Research on Teaching. Rand McNally.

PERLBERG, A. (1970). Microteaching: A New Procedure to Improve Teaching and Training. Journal of Educational Technology, 1, 1, 35-43.

PERLBERG, A. *et al.*, (1971). Studies on the Use of Video Tape Recordings and Microteaching Techniques to Improve University Teaching. Paper presented to the American Educational Research Association Conference, New York.

PERROTT, E., APPLEBEE, A.N., HEAP, B. AND WATSON, E.P. (1975). Changes in Teaching Behaviour After Completing a Self-instructional Microteaching Course (1). Programmed Learning and Educational Technology, 12, 6, 348-361.

PERROTT, E., APPLEBEE, A.N., HEAP, B. and WATSON, E.P. (1976). An Investigation into Teachers' Reactions to a Self-instructional Microteaching Course. Programmed Learning and Educational Technology, 13, 2, 25-35.

PERROTT, E. and DUTHIE, J.H. (1970). Television as a Feedback Device in Microteaching. Educational Television International, 4, 4, 258-61.

PETERSON, T.L. (1973). Microteaching in the Preservice Education of Teachers: Time for a Reexamination. The Journal of Educational Research, 67, 1.

REED, C.L., VAN MONDFRANS, A.P. and SMITH, T.M. (1970). Effect of Microteaching, Directive and Non-directive Lectures on Achievement and Attitudes in a Basic Educational Psychology Course. Effect of Mode of Feedback in Microteaching (two documents combined). Papers presented at the Annual Meeting of the American Educational Research Association. ERIC ED: 037 791.

RESNICK, L.B. and KISS, L.E. (1970). Discrimination Training and Feedback in Shaping Teacher Behaviour. Paper presented to the American Education Research Association.

REZLER, A.G. and ANDERSON, A.S. (1971). Focused and Unforcused Feedback and Self-perception. The Journal of Educational Research, 65, 2, 61-64.

ROGERS, C. (1969). Freedom to Learn. Columbus, Ohio: Chas. E. Merrill.

ROKEACH, M. (1960). The Open and Closed Mind. Basic Books, New York.

ROSENSHINE, B. (1971). Teaching Behaviours and Student Achievement. London: National Foundation for Educational Research in England and Wales.

ROSENTHAL, R. and ROSNOW, R.L. (eds.) (1969). Artifact in Behavioral Research. New York: Academic Press.

ROUSCH, R.E. (1969). Changing Teacher Behavior and Videotape Feedback. SRIS Quarterly, Summer issue.

RYAN, K.A. (1966). The Use of Students' Written Feedback in Changing the Behavior of Beginning Secondary School Teachers. Unpublished Ph.D. dissertation, Stanford University. In VAN MONDRANS, A.P. and HISCOX, S.B. (1973). Microteaching: Variations of the Model. Paper presented at the Annual Meeting of the American Educational Research Association.

RYANS, D.G. (1960). Characteristics of Teachers: Their Description, Comparison, and Appraisal. Washington, D.C.: American Council of Education.

SALAMON, G. and McDONALD, F.J. (1970). Pretest and Posttest Reactions to Self-viewing One's Performance on Video Tape. Journal of Educational Psychology, 61, 4, 280-86.

SCHUELLER, H., GOLD, M.J. and MITZEL, H.E. (1962). The Use of Television for Improving Teacher Training and for Improving Measures of Student-teaching Performance. Improvement of Student-teaching, Phase 1 Report, Hunter College, New York.

SHAVER, J.P. and RICHARDS, H.E. (1971). Open-closed Mindedness and an Inquiry-oriented Social Studies Methods Course. The Journal of Educational Research, 65, 2, 85-93.

SHEFFIELD, F.D. (1961). Theoretical Considerations in the Learning of Complex Sequential Tasks from Demonstration and Practice. In LUMSDAINE, A.A. (ed.), Student Response in Programmed Instruction, 13-32.

SHEFFIELD, F.D. and MACCOBY, N. (1961). Summary and Interpretation of Research on Organisational Principles in Constructing Filmed Demonstrations. In LUMSDAINE, A.A. (ed.), Student Response in Programmed Instruction, 117-140.

SHIVELY, J.E., VAN MONDFRANS, A.P. and REED, C. (1970). The Effect of Mode of Feedback in Microteaching. Paper presented at the Annual Meeting of the American Educational Research Association.

SIEDMAN, E. (1969). A Critical Look at Microteaching. In Student Guide to Microteaching. Center for Cybernetic Studies, Ontario. ED 033 918.

SMITH, B.O., COHEN, S.B. and PEARL, A. (1969). Teachers for the Real World. American Association of Colleges of Teacher Education.

SMITH, B.O. and MEUX, M.O. (1962). A Study of the Logic of Teaching. Urbana, Illinois: University of Illinois Press.

SMITH, L.M. and GEOFFREY, W. (1968). The Complexities of an Urban Classroom. New York: Holt, Rinehart.

SMITH, P.A. (1969). Remote Supervision of Student Teachers. In COTRELL, C.J. and BICE, M. (eds.). Annual National Vocational-Technical Teacher Education Seminar: Microteaching and Video Recording, U.S.A.

SMITH, L.M. and GEOFFREY, W. (1968). The Complexities of an Urban Classroom. New York: Holt, Rinehart.

SNOW, R.E. (1972). A Model Teacher Training System: An Overview. Research and Development Memorandum No.92. Stanford Center for Research and Development in Teaching, Stanford School of Education, Stanford University.

STEINBACH, A. and BUTTS, D.P. (1969). A Comparative Study of the Effect of Practice with Elementary Children or with Peers in the Science Methods Course. Research and Development Report Series No.10, Research and Development Center for Teacher Education, the University of Texas at Austin.

STENHOUSE, L. (1975). An Introduction to Curriculum Research and Development. London: Heinemann.

STOLUROW, L.M. (1965). Model the Master Teacher or Master the Teaching Model. In DRUMBOLTZ, J.D. (ed.), Learning and the Educational Process. Chicago: Rand McNally, 223-47.

STONES, E. and MORRIS, S. (1972a). Teaching Practice: Problems and Perspectives. London: Methuen.

STONES, E. and MORRIS, S. (1972b). The Assessment of Practical Teaching. Educational Research, 14, 2.

STRASSER, B. (1967). A Conceptual Model of Instruction. Journal of Teacher Education, 18, 1, 63-74.

TABA, H., LEVINE, S. and ELZEY, F. (1964). Thinking in Elementary School Children. Cooperative Research Project No.1574. San Francisco: San Francisco State College.

THEW, D.M. (1973). Learning to Teach: A 'Dimensional Skills' Approach for Teacher Education. The Australian Journal of Education, 17, 3, 265-275.

TOLMAN, E.C. (1959). Principles of Purposive Behavior. In KOCH, S. (ed.), Psychology: A Study of a Science. New York: McGraw-Hill, Vol.2, 92-157.

TRAILL, R.D. (1971). The Effects of Using Interaction Analysis as a Means of Assisting Student Teachers to Analyse Teaching Behaviour. Australian Journal of Education, 15, 3, 295-304.

TUCKMAN, B.W. and OLIVER, W.F. (1968). Effectiveness of Feedback to Teachers as a Function of Source. Journal of Educational Psychology, 59, 4, 297-301.

TURNEY, C. (1970). Micro-teaching — A Promising Innovation in Teacher Education. American Journal of Education, 14, 2, 125-141.

VACCHIANO, R.B., STRAUSS, P.S. and HOCHMAN, L. (1969). The Open and Closed Mind: A Review of Dogmatism. Psychological Bulletin, 71, 4, 261-273.

WAGNER, A.C. (1972). Is Practice Really Necessary? An Experimental Study on the Role of Practicing vs. Cognitive Discrimination Learning in Behavioural Change. Paedagogische Hochschule Reutlingen. Paper presented at the International Microteaching Symposium, Tübingen, West Germany.

WAGNER, A.C. (1973). Changing Teacher Behaviour: A Comparison of Microteaching and Cognitive Discrimination Training. Journal of Educational Psychology, 64, 3, 299-305.

WAIMON, M.D., BELL, D.D. and RAMSEYER, G.C. (1972). The Effects of Competency-based Training on the Performance of Prospective Teachers. The Journal of Teacher Education, 23, 2, 237-245.

WAIMON, M.D. and RAMSEYER, G.C. (1970). Effects of Videotape Feedback on the Ability to Evaluate Teaching. The Journal of Teacher Education, 21, 1, 92-5.

WARD, B.E. (1970). A Survey of Microteaching in NCATE-accredited Secondary Education Programs. Research and Development Memorandum No.70, Stanford Center for Research and Development in Teaching, Stanford University.

WARD, P.M. (1970). The Use of the Portable Videotape Recorder in Helping Teachers Self-evaluate their Teaching Behavior (University of California). In TURNEY, C., CLIFT, J.C., DUNKIN, M.J. and TRAILL, R.D., Microteaching: Research, Theory and Practice. Sydney University Press, p.23.

WEBB, C., BELT, D. and BAIRD, H. (1968). Description of a Large-scale Microteaching Program. Brigham Young University (mimeo.).

WEIL, M. (1973). Deriving Teaching Skills from Models of Teaching. A paper presented at the Annual Meeting of the American Educational Research Association.

WEISS, L. (1972). The Co-operative Summer School: A Modification of the Microteaching Approach to Teacher Training. Research and Development Memorandum No.86, Stanford Center for Research and Development in Teaching, School of Education, Stanford University.

WHITE, F.J. (1972). Observational Learning of Indirect Verbal Behavior Through the Medium of Audio-tapes. Journal of Educational Research, 65, 9, 417-19.

WILSON, J.B. (1974). Teddybear: Statistical Programme, Technical Report T5. Computing Centre, University of Otago, Dunedin, New Zealand.

WINER, B.J. (1970). Statistical Principles in Experimental Design. McGraw-Hill (International Student Edition).

WOOD, C.C. and HEDLEY, R.L. (1968). Training Instructional Practice (TIPS): Observation on Student Reaction to the Use of Video-tape Recordings (VTR) in Simulated Classroom Situations. Canadian Education and Research Digest, 8, 46-59.

WRAGG, E.C. (1971). The Influence of Feedback on Teachers' Performance. Educational Research, 13, 3, 218-21.

WULFF, J.J. and KRAELING, D. (1961). Familiarization Procedures Used as Adjuncts to Assembly-Task Training with a Demonstration Film. In LUMSDAINE, A.A. (ed.), Student Response in Programmed Instruction, 141-154.

YOUNG, D.A. (1970). A Preliminary Report on the Effectiveness of Colleague Supervision on the Acquisition of Selected Teaching Behaviors in a Microteaching Series. Paper presented at the Annual Meeting of the American Education Research Association, Minneapolis. ERIC ED: 038 330.

YOUNG, D.B. (1968). The Effectiveness of Self-instruction in Teacher Education Using Modelling and Video Tape Feedback. Paper presented at the Annual Meeting of the American Educational Research Association.

YOUNG, D.B. (1969). The Modification of Teacher Behavior using Audio Video-taped models in a Micro-teaching Sequence. Educational Leadership, January, 394-403.

YOUNG, D.A. and YOUNG, D.B. (1969). The Effectiveness of Individually Prescribed Microteaching Training Modules on an Interns Subsequent Classroom Performance. Paper presented at the Annual Conference of the American Educational Research Association.

ZAHN, R. (1965). The Use of Interaction Analysis in Supervising Student Teachers. Dissertation Abstracts, 26 : 1504.