CHANGING TEACHER BEHAVIOUR AND PUPIL ATTAINMENT IN INQUIRY-BASED SOCIAL STUDIES LESSONS

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VOLUME TWO

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TABLE 5.1 Age, years of service, and class taught of experimental group teachers.

	Number		
	Exper. One	Exper. Two	Control
Age: 21-29 yrs.	3	3	3
30-39 yrs.	4	4	3
40-49 yrs.	1	1	2
Total	8	8	8
Years of service:			
2-5 yrs.	2	2	2
6-10 yrs.	4	4	2
11-15 yrs.	1	1	2
16-20 yrs.	-	-	1
21-30 yrs.	1	1	1
Total	8	8	8
Class: Form 1	4	5	3
Form 2	4	3	5
Total	8	8	8

Means*

	Exper. One	Exper. Two	Control
Age: yrs.	32.5	32.5	33.8
Years of service: yrs.	9.8	9.8	11.4

*Note: Means were calculated from years based on the mid-points of each range.

TABLE 5.2 Sample classes: Number of pupils, with mean age and I.Q.

Class		N	Mean age (mths)	Mean I.Q.
ES	1	26	144	102
	2	27	135	101
	3	27	147	101
	4	24	136	105
	5	20	135	104
	6	26	149	102
	7	21	131	124
	8*	23	148	101
EG	9	17	131	100
	10	26	146	102
	11	23	147	99
	12	19	134	101
	13	22	134	106
	14	19	149	103
	15	15	135	104
	16	14	135	95
C	17	19	150	97
	18	23	134	103
	19	23	149	98
	20	22	137	92
	21	28	148	93
	22	23	149	96
	23	19	146	109
	24*	17	136	96

*not used in delayed lesson computations.

TABLE 6.1 Difficulty and discrimination indices for multiple-choice items of parallel form achievement tests.

Item number	Tonga		Hopi		Temiar	
	Diff.	Discr.	Diff.	Discr.	Diff.	Discr.
1	.83	.33	.82	.36	.83	.33
2	.80	.27	.82	.36	.80	.27
3	.70	.27	.71	.29	.80	.27
4	.70	.60	.68	.36	.70	.60
5	.60	.40	.64	.43	.60	.53
6	.53	.40	.61	.36	.53	.40
7	.47	.40	.54	.36	.47	.40
8	.43	.33	.54	.27	.43	.33
9	.37	.47	.36	.57	.37	.47
10	.73	.40	.79	.43	.73	.40
11	.73	.40	.68	.50	.73	.40
12	.67	.40	.64	.71	.67	.40
13	.60	.53	.64	.43	.63	.27
14	.60	.67	.61	.36	.60	.67
15	.57	.33	.61	.50	.57	.33
16	.53	.27	.61	.64	.53	.27
17	.50	.47	.61	.36	.50	.47
18	.47	.40	.54	.36	.47	.40
19	.70	.33	.68	.64	.70	.33
20	.70	.47	.57	.43	.70	.47
21	.53	.40	.46	.50	.53	.40
22	.50	.33	.46	.64	.50	.33
23	.50	.73	.46	.93	.57	.73
24	.47	.40	.29	.43	.47	.40
Means	59.71	41.67	59.88	46.75	60.12	41.13

TABLE 6.2 Means for cognitive memory, higher-order thinking, evaluative and divergent thinking sub-tests of the parallel-form achievement tests (based on pilot test scores with N = 54).

Sub-test	Means		
	Tonga	Hopi	Temiar
Memory recall	5.2	5.7	5.5
Higher order	9.0	8.6	8.8
Total	14.2	14.3	14.3
Evaluative	6.5	6.5	7.1
Divergent	9.1	7.1	9.1
Total	15.6	13.6	16.2

TABLE 6.3 Standard deviations for total of 24 multiple-choice items, based on pilot test scores (N = 54).

	Test		
	Tonga	Hopi	Temiar
S.D.	4.75	4.29	4.37

TABLE 6.4 Inter-correlation table for total of multiple-choice items on parallel form achievement tests, with Otis Intermediate Intelligence Test Quotients (pilot-test pupils, N = 54).

	Tonga	Hopi	Temiar	Otis A
Tonga	-	.69	.78	.77
Hopi	.69	-	.78	.71
Temiar	.78	.78	-	.68
Otis A	.77	.71	.68	-

TABLE 6.5 Table of specifications for achievement tests: multiple choice items.

	Number of items					
	Cognitive Memory			Higher-order		
	Tonga	Hopi	Temiar	Tonga	Hopi	Temiar
Role function	2	1	2	3	2	1
Location-spatial	2	4		2		1
Physical environment	1			2	3	3
Agriculture	1	1	4	1	2	2
Population	2					
Housing			1			2
Responsibility				1	1	1
Cooperation				3	1	2
Values				1	1	-
Technology				1	2	1
Culture contact		1		1	1	1
Cultural group	1		1			
Education					1	
Trade		1				1
Terminology		1	1		1	
Totals	9	9	9	15	15	15

TABLE 6.6 Table of specifications for achievement tests: free response items.

	Number of items					
	Evaluative thinking			Divergent thinking		
	Tonga	Hopi	Temiar	Tonga	Hopi	Temiar
Cultural environment	1	1	1			
Life style	1	1	1			
Health and education	1		1			
Problems		1				
Technology				1	1	1
Communication				1		
Physical environment				1	1	1
Trading					1	1
Totals	3	3	3	3	3	3

TABLE 6.7 Varimax rotated factor loadings on split-half subtests of pilot scores.

Subtest	Factor			
	1	2	3	4
Memory A	.01	.80	.02	.32
Memory B	.11	.83	.09	.08
Middle order A	.09	.29	.19	.32
Middle order B	.15	.36	.01	.79
Higher order A	.23	.09	.00	.86
Higher order B	.21	.10	.06	.30
Evaluative A	.65	.23	.11	.06
Evaluative B	.81	.06	.36	.09
Divergent A	.78	.00	.06	.32
Divergent B	.66	.41	.30	.10
% variance attributable to the factor	35.9	13.1	11.2	7.9

TABLE 6.8 Varimax rotated factor loadings on final form of Tonga subtests.

Subtest	Factor				
	1	2	3	4	5
Memory	.10	.95	.06	.15	.24
Middle order	.11	.29	.14	.32	.88
Higher order	.17	.16	.19	.91	.29
Evaluative	.95	.11	.23	.16	.10
Divergent	.23	.06	.95	.15	.12
% variance attributable to the factor	52.0	19.9	11.9	10.0	6.2

TABLE 6.9 Inter-coder reliability coefficients* for question types coded from five lesson transcripts.

Question category	Transcript				
	1	2	3	4	5 (delay)
Cognitive memory	.83	.73	.90	.88	.88
Convergent	.68	.75	.77	.81	.76
Evaluative	.75	.80	.82	.86	.83
Divergent	1.00		.88	1.00	.80
Grounding	.60	.86	1.00	.90	.67
Extension	.75	.89	.71	.80	1.00
Routine	.82	.96	1.00	1.00	1.00
Total (mean)	.78	.82	.87	.89	.85

*Smith *et al.*, (1962) method.

TABLE 6.10 Inter-coder reliability coefficients computed by the Scott Index.

Reliability check	Coefficient
1	.67
2	.78
3	.84
4	.84
5 (delay)	.82

TABLE 6.11 Intra-coder reliability coefficients computed by the Smith *et al.*, method.

Question category	Coder 1	Coder 2
Cognitive memory	.94	.85
Convergent	.77	.76
Evaluative	.73	1.00
Divergent	.80	.88
Grounding	.50	.75
Extension	.67	.80
Routine	1.00	1.00
Total (mean)	.77	.86

TABLE 7.1 Multivariate analysis of variance for teacher variables: frequency of cognitive memory, convergent, evaluative, divergent, extension, grounding, routine and total questions.

Lesson	F	d.f.	p
Pretreatment	0.86	16	0.61(N.S.)
Posttreatment 1	3.16	16	<0.01
Posttreatment 2	2.98	16	<0.01

TABLE 7.2 Multivariate analysis of variance for teacher variables: percentage of cognitive memory, convergent, evaluative, divergent, extension, grounding, routine questions, and inquiry ratio.

Lesson	F	d.f.	p
Pretreatment	1.08	16	0.42(N.S.)
Posttreatment 1	4.45	16	<0.001
Posttreatment 2	2.35	16	<0.05

TABLE 7.3 Multivariate analysis of variance for teacher talk and interaction patterns.

Lesson	F	d.f.	p
Pretreatment	0.56	8	0.80(N.S.)
Posttreatment 1	3.02	8	<0.01
Posttreatment 2	3.30	8	<0.01

TABLE 7.4 Frequency of primary question types asked by teachers in pretreatment (L1) and posttreatment lessons (L2, L3).

Group	Teacher	Question type											
		Memory			Convergent			Evaluative			Divergent		
		L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
ES Group	1	36	22	18	28	9	10	13	6	11	0	9	8
	2	47	10	11	7	8	10	8	3	12	0	4	3
	3	39	10	28	16	3	13	10	24	12	1	0	2
	4	22	7	6	13	5	3	12	12	13	1	5	0
	5	11	8	6	2	3	8	17	13	7	0	5	8
	6	27	11	32	16	9	11	9	14	23	4	3	2
	7	12	5	6	7	6	2	11	7	10	1	7	7
	8	15	10	-	9	9	-	9	15	-	3	6	-
EG Group	9	60	31	27	25	21	33	6	12	22	0	2	2
	10	12	33	53	4	12	17	13	9	11	1	0	2
	11	54	78	49	6	14	36	11	13	9	0	0	0
	12	10	35	24	7	3	3	3	2	17	0	0	1
	13	30	31	39	15	20	11	11	10	9	0	0	1
	14	36	43	34	11	11	16	17	5	8	0	2	5
	15	34	32	55	19	16	11	14	11	10	0	3	0
	16	29	49	21	18	18	21	18	17	12	5	3	2
Control Group	17	23	14	-	10	19	-	4	2	-	1	1	-
	18	18	36	27	8	12	20	17	4	6	0	2	0
	19	11	16	21	9	12	16	12	15	6	0	0	0
	20	20	20	9	8	4	10	13	9	8	0	3	0
	21	45	33	33	26	17	24	6	3	7	0	0	3
	22	21	35	29	27	9	15	13	10	14	0	0	0
	23	30	23	36	22	10	10	4	12	9	0	1	1
	24	19	22	24	16	21	19	13	6	7	2	2	0

TABLE 7.5 Frequency of secondary question types, and total number of questions asked by teachers in pretreatment (L1) and posttreatment lessons (L2, L3).

Group	Teacher	Question type											
		Grounding			Extension			Routine			Total questions asked		
		L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
ES Group	1	7	1	3	7	9	7	7	2	3	98	58	60
	2	3	4	2	9	11	7	13	6	9	87	46	54
	3	10	11	9	2	1	7	9	4	10	87	53	81
	4	4	7	1	5	1	2	15	13	12	72	50	37
	5	9	4	4	12	2	8	15	15	4	66	50	45
	6	4	8	14	13	11	6	6	2	8	79	58	96
	7	3	3	2	7	6	5	10	2	2	51	36	34
	8	6	12	-	7	8	-	8	17	-	67	77	-
EG Group	9	6	8	9	15	12	15	15	14	18	127	100	126
	10	6	3	5	7	16	10	4	5	5	47	78	103
	11	12	3	5	11	6	10	14	21	32	108	135	141
	12	12	4	6	3	9	0	8	1	9	43	54	60
	13	14	5	1	2	3	4	9	3	3	81	72	68
	14	9	1	1	6	6	6	7	9	21	86	77	91
	15	19	10	5	6	12	8	18	11	7	110	95	96
	16	4	2	0	5	5	2	9	4	8	88	98	66
Control Group	17	2	0	-	2	0	-	4	3	-	46	39	-
	18	11	0	4	15	18	20	3	2	6	72	74	83
	19	9	8	3	9	3	5	8	5	0	58	59	51
	20	9	16	9	16	6	16	21	12	8	87	70	60
	21	7	10	7	2	20	12	15	5	3	101	88	89
	22	2	2	2	11	11	20	7	6	6	81	73	86
	23	13	10	5	1	11	11	49	40	25	119	107	97
	24	6	4	8	15	6	4	13	4	1	84	65	63

TABLE 7.6 Frequency ratio of each type of primary question to total primary questions asked by teachers in pretreatment (L1) and posttreatment lessons (L2, L3) (expressed as percentage).

Group	Teacher	Question type											
		Memory			Convergent			Evaluative			Divergent		
		L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
ES Group	1	47	48	38	36	19	21	17	20	24	0	2	17
	2	76	40	31	11	32	28	13	12	33	0	16	8
	3	59	27	50	24	8	24	15	65	22	2	0	4
	4	46	24	27	27	17	14	25	42	35	2	17	0
	5	37	28	20	6	10	28	57	45	24	0	17	28
	6	48	30	47	29	24	16	16	8	34	7	14	3
	7	39	20	24	23	24	8	35	28	40	3	28	28
	8	56	25	-	19	22	-	19	38	-	6	15	-
EG Group	9	66	47	32	27	32	40	7	18	26	0	3	2
	10	30	61	64	13	22	21	43	17	13	3	0	2
	11	76	74	52	9	13	38	15	12	10	0	0	0
	12	50	88	53	35	7	7	15	5	38	0	0	2
	13	54	51	65	27	33	18	19	16	15	0	0	2
	14	56	70	54	17	18	25	27	8	13	0	3	8
	15	51	52	72	28	26	15	21	17	13	0	5	0
	16	41	56	38	26	21	38	26	20	20	7	3	4
Control Group	17	61	39	-	26	52	-	11	6	-	2	3	-
	18	42	67	51	19	22	38	40	7	11	0	4	0
	19	34	37	49	28	28	37	38	35	14	0	0	0
	20	49	56	33	20	11	37	31	25	30	0	8	0
	21	58	62	49	34	32	36	8	6	11	0	0	4
	22	35	65	50	44	17	26	21	18	24	0	0	0
	23	54	50	64	39	22	18	7	26	16	0	2	2
	24	38	43	48	32	41	38	26	12	14	4	4	0

TABLE 7.7 Frequency ratio of each type of secondary question to total questions asked by teachers in pretreatment (L1) and posttreatment lessons (L2, L3) (expressed as a percentage).

Group	Teacher	Question type								
		Grounding			Extension			Routine		
		L1	L2	L3	L1	L2	L3	L1	L2	L3
ES Group	1	7	2	5	7	16	12	7	3	2
	2	3	9	4	10	24	13	15	13	17
	3	11	21	11	2	2	9	10	8	12
	4	5	14	3	7	2	5	21	26	32
	5	14	8	9	18	4	18	23	30	9
	6	5	14	15	17	19	6	8	3	8
	7	6	8	6	14	17	15	20	6	6
	8	8	16	-	10	10	-	12	22	-
EG Group	9	4	8	7	12	12	12	12	14	14
	10	13	4	5	15	21	10	9	6	5
	11	11	2	4	10	4	7	13	15	23
	12	28	7	10	7	17	0	19	2	15
	13	17	7	1	2	4	6	11	4	4
	14	10	1	1	7	8	7	8	12	23
	15	17	11	5	5	13	8	16	12	7
	16	4	2	0	6	5	3	10	4	12
Control Group	17	4	0	-	4	0	-	9	8	-
	18	15	0	5	21	24	24	1	3	7
	19	16	14	6	16	5	10	14	8	0
	20	10	23	15	18	9	27	24	17	13
	21	7	11	8	2	23	13	15	6	3
	22	2	3	2	14	15	23	8	8	7
	23	11	9	5	0	10	11	41	37	25
	24	7	6	13	18	9	6	15	6	2

TABLE 7.8 Proportion of teacher talk and pupil talk in pretreatment (L1) and posttreatment lessons (L2, L3) (expressed as percentage).

Group	Teacher	Lesson 1		Lesson 2		Lesson 3	
		T	Pupil	T	Pupil	T	Pupil
ES Group	1	76.4	23.6	44.1	55.9	45.4	54.6
	2	75.3	24.7	38.8	61.2	41.3	58.7
	3	65.9	34.1	47.4	52.6	42.4	57.6
	4	44.8	55.2	34.1	65.9	23.3	76.7
	5	47.7	52.3	29.7	70.3	29.4	70.6
	6	75.8	24.2	43.6	56.4	55.2	44.8
	7	60.1	39.9	26.2	73.8	16.6	83.4
	8	84.0	16.0	55.9	44.1	-	-
	Means	66.3	33.7	39.9	60.1	37.6	62.4
EG Group	9	75.8	24.2	70.7	29.3	72.8	27.2
	10	48.7	51.3	64.7	35.3	70.7	29.3
	11	62.8	37.2	74.1	25.9	77.7	22.3
	12	50.1	49.9	76.4	23.6	64.2	35.8
	13	39.8	60.2	49.9	50.1	46.4	53.6
	14	43.7	56.3	61.2	38.8	51.6	48.4
	15	60.8	39.2	58.4	41.6	70.0	30.0
	16	78.9	21.1	68.3	31.7	74.3	25.7
	Means	57.6	42.4	65.5	34.5	66.0	34.0
Control Group	17	51.0	49.0	45.2	54.8	-	-
	18	55.5	44.5	54.2	45.8	50.0	50.0
	19	56.2	43.8	39.9	60.1	51.8	48.2
	20	58.6	41.4	69.3	30.7	68.1	31.9
	21	62.6	37.4	73.1	26.9	70.3	29.6
	22	62.8	37.2	62.6	37.4	58.8	41.2
	23	78.4	21.6	89.6	10.4	88.6	11.4
	24	72.6	27.4	80.5	19.5	69.7	30.3
	Means	62.2	37.8	64.3	35.7	65.3	34.7

TABLE 7.9 Inquiry scores for teachers in pretreatment (L1) and posttreatment lessons (L2, L3).

Group	Teacher	Inquiry score*		
		L1	L2	L3
ES Group	1	.28	.43	.48
	2	.23	.48	.44
	3	.26	.68	.38
	4	.31	.50	.43
	5	.58	.48	.60
	6	.38	.62	.47
	7	.43	.64	.71
	8	.37	.53	-
	Means	.36	.55	.50
EG Group	9	.21	.34	.38
	10	.57	.40	.27
	11	.31	.16	.17
	12	.42	.28	.40
	13	.33	.25	.25
	14	.37	.18	.22
	15	.35	.38	.24
	16	.36	.28	.24
	Means	.37	.28	.27
Control Group	17	.20	.07	-
	18	.60	.32	.36
	19	.52	.44	.27
	20	.44	.49	.55
	21	.15	.38	.33
	22	.32	.32	.42
	23	.15	.32	.27
	24	.43	.28	.30
	Means	.35	.33	.36

*Inquiry score = $\frac{\text{Evaluative+Divergent+Grounding+Extension questions asked}}{\text{Total questions asked}}$

TABLE 7.10 Means, standard deviations and standard error of means, for frequency of question types asked in pretreatment (L1) and posttreatment lessons (L2, L3).

Question type	Experimental group	Mean			Standard deviation			Standard error		
		L1	L2	L3*	L1	L2	L3	L1	L2	L3
Cognitive memory	ES (N=8)	27.5	10.4	15.3*	12.9	5.1	11.0	4.5	1.8	4.2
	EG (N=8)	33.1	41.5	37.8	17.6	16.1	13.4	6.2	5.7	4.7
	C (N=8)	23.4	24.9	25.6*	10.2	8.7	8.9	3.6	3.1	3.4
Convergent	ES	12.3	6.5	8.1	8.0	2.6	4.1	2.8	0.9	1.6
	EG	13.1	14.4	18.5	7.4	5.8	11.2	2.6	2.1	4.0
	C	15.8	13.0	16.3	8.2	5.7	5.2	2.9	2.0	2.0
Evaluative	ES	11.1	11.8	12.6	2.9	6.5	5.0	1.0	2.3	1.9
	EG	11.6	9.9	12.3	5.1	4.7	4.8	1.8	1.7	1.7
	C	10.3	7.6	8.1	4.9	4.6	2.8	1.7	1.6	1.1
Divergent	ES	1.3	4.9	4.3	1.5	2.7	3.3	0.5	1.0	1.2
	EG	0.8	1.3	1.6	1.8	1.4	1.6	0.6	0.5	0.6
	C	0.4	1.1	0.6	0.7	1.1	1.1	0.3	0.4	0.4
Grounding	ES	5.8	6.3	5.0	2.7	3.9	4.8	1.0	1.4	1.8
	EG	10.3	4.5	4.0	5.0	3.1	3.1	1.8	1.1	1.1
	C	7.4	6.3	5.4	4.0	5.7	2.6	1.4	2.0	1.0
Extension	ES	7.8	6.1	6.0	3.6	4.3	2.0	1.3	1.5	0.8
	EG	6.9	8.6	6.9	4.3	4.4	4.9	1.5	1.6	1.7
	C	8.9	9.4	12.6	6.4	7.0	6.5	2.3	2.5	2.5
Routine	ES	10.4	7.6	6.9	3.5	6.3	3.8	1.3	2.2	1.5
	EG	10.5	8.5	12.9	4.7	6.7	9.9	1.7	2.4	3.5
	C	15.0	9.6	7.0	14.9	12.6	8.4	5.3	4.5	3.2
Total questions asked	ES	76.0	53.5	58.1	15.0	11.8	23.0	5.3	4.2	8.7
	EG	86.3	88.6	93.9	29.6	24.3	29.1	10.5	8.6	10.3
	C	81.0	71.9	75.6	23.1	20.0	17.4	8.2	7.1	6.6

*Groups ES and C had N = 7 for L3.

TABLE 7.11 Means, standard deviations, and standard error of means, for percentages of teacher-pupil interaction patterns in pretreatment (L1) and posttreatment lessons (L2, L3).

Interaction pattern	Experimental group	Mean			Standard deviation			Standard error		
		L1	L2	L3†	L1	L2	L3	L1	L2	L3
T-P_1-T*	ES (N=8)	93.1	70.6	71.6	5.2	13.9	12.6	1.8	4.9	4.8
	EG (N=8)	90.9	90.4	91.4	7.0	8.7	6.1	2.5	3.1	2.2
	C (N=8)	92.1	90.2	91.7	3.5	5.2	5.9	1.3	1.8	2.2
T-$P_{2,3}$-T*	ES	6.6	22.5	22.4	5.0	10.5	9.5	1.8	3.7	3.6
	EG	8.2	8.8	8.2	5.9	7.3	6.0	2.1	2.6	2.1
	C	7.6	9.5	7.4	3.3	4.9	5.2	1.2	1.7	2.0
T-P_{4+}-T*	ES	0.3	6.9	6.0	0.5	5.3	4.2	0.2	1.9	1.6
	EG	0.9	0.8	0.4	1.3	1.2	0.5	0.4	0.4	0.2
	C	0.3	0.3	0.9	0.5	0.5	1.6	0.2	0.2	0.6

*$T\text{-}P_1\text{-}T$ = Teacher speaks - one pupil speaks - teacher speaks.

$T\text{-}P_{2,3}\text{-}T$ = Teacher speaks - 2 or 3 pupils speak - teacher speaks.

$T\text{-}P_{4+}\text{-}T$ = Teacher speaks - 4 or more pupils speak - teacher speaks.

†Groups ES and C had N = 7 for L3.

TABLE 7.12 Frequency of cognitive memory teacher questions in pre-treatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	27.50	12.86	4.55
EG	33.13	17.63	6.23
Control	23.38	10.21	3.61

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	383.25	2	191.63	0.99	NS
Within groups	4062.75	21	193.46		
Total	4446.00	23			

TABLE 7.13 Frequency of convergent teacher questions in pre-treatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	12.25	8.00	2.83
EG	13.13	7.36	2.60
Control	15.75	8.19	2.90

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	53.08	2	26.54	0.43	NS
Within groups	1295.88	21	61.71		
Total	1348.96	23			

TABLE 7.14 Frequency of evaluative teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	11.13	2.90	1.03
EG	11.63	5.13	1.81
Control	10.25	4.89	1.73

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	7.75	2	3.88	0.20	NS
Within groups	410.25	21	19.54		
Total	418.00	23			

TABLE 7.15 Frequency of divergent teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	1.25	1.49	0.53
EG	0.75	1.75	0.62
Control	0.38	0.74	0.26

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	3.08	2	1.54	0.79	NS
Within groups	40.88	21	1.95		
Total	43.96	23			

TABLE 7.16 Frequency of grounding teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	5.75	2.71	0.96
EG	10.25	4.98	1.76
Control	7.36	3.96	1.40

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	83.08	2	41.54	2.16	NS
Within groups	334.88	21	15.95		
Total	417.96	23			

TABLE 7.17 Frequency of extension teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	7.75	3.58	1.26
EG	6.88	4.26	1.51
Control	8.88	6.40	2.26

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	16.08	2	8.04	0.34	NS
Within groups	503.25	21	23.96		
Total	519.33	23			

TABLE 7.18 Frequency of routine teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	10.38	3.54	1.25
EG	10.50	4.69	1.66
Control	15.00	14.99	5.30

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	111.08	2	55.54	0.64	NS
Within groups	1815.88	21	86.47		
Total	1926.96	23			

TABLE 7.19 Total frequency of teacher questions in pre-treatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	76.00	15.02	5.31
EG	86.25	29.62	10.47
Control	81.00	23.07	8.15

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	420.33	2	210.17	0.39	NS
Within groups	11443.50	21	544.93		
Total	11863.83	23			

TABLE 7.20 Proportion of cognitive memory teacher questions in pre-treatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	51.00	12.56	4.44
EG	53.00	14.11	4.99
Control	46.38	10.60	3.75

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	184.75	2	92.38	0.59	NS
Within groups	3283.88	21	156.38		
Total	3468.63	23			

TABLE 7.21 Proportion of convergent teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	21.88	9.72	3.44
EG	22.75	8.80	3.11
Control	30.25	8.76	3.10

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	339.08	2	169.54	2.05	NS
Within groups	1739.88	21	82.85		
Total	2078.96	23			

TABLE 7.22 Proportion of evaluative teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	24.63	14.87	5.26
EG	21.63	10.78	3.81
Control	22.75	13.12	4.66

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	36.75	2	18.36	0.11	NS
Within groups	3577.25	21	170.35		
Total	3614.00	23			

TABLE 7.23 Proportion of divergent teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	2.50	2.73	0.96
EG	1.25	2.55	0.90
Control	0.75	1.49	0.53

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	13.00	2	6.50	1.21	NS
Within groups	113.00	21	5.38		
Total	126.00	23			

TABLE 7.24 Proportion of grounding teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	7.38	3.58	1.27
EG	13.00	7.86	2.78
Control	9.00	4.96	1.75

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	134.08	2	67.04	2.01	NS
Within groups	693.88	21	33.04		
Total	827.96	23			

TABLE 7.25 Proportion of extension teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	10.63	5.45	1.93
EG	8.00	4.14	1.46
Control	11.63	8.28	2.93

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	56.08	2	28.04	0.73	NS
Within groups	807.75	21	38.46		
Total	863.83	23			

TABLE 7.26 Proportion of routine teacher questions in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	14.50	6.21	2.20
EG	12.25	3.69	1.31
Control	15.88	12.15	4.29

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	53.58	2	26.79	0.40	NS
Within groups	1398.38	21	66.59		
Total	1451.96	23			

TABLE 7.27 Teacher inquiry score for pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	35.50	11.30	4.00
EG	36.50	10.25	3.63
Control	35.13	17.29	6.11

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	8.08	2	4.04	0.02	NS
Within groups	3722.88	21	177.28		
Total	3730.96	23			

TABLE 7.28 Proportion of teacher to pupil talk in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	66.25	14.17	5.01
EG	57.75	14.46	5.11
Control	62.50	9.35	3.31

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	290.33	2	145.17	0.88	NS
Within groups	3481.00	21	165.76		
Total	3771.33	23			

TABLE 7.29 Proportion of interaction pattern T-P_1-T* in pretreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	93.13	5.19	1.84
EG	90.88	7.04	2.49
Control	92.13	3.52	1.25

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	20.33	2	10.17	0.34	NS
Within groups	622.63	21	27.95		
Total	642.96	23			

*Teacher talks - one pupil talks - teacher talks.

TABLE 7.30 Proportion of interaction pattern T-$P_{2,3}$-T* in pre-treatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.63	4.98	1.76
EG	8.25	5.85	2.07
Control	7.63	3.29	1.16

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	10.75	2	5.38	0.23	NS
Within groups	489.25	21	23.30		
Total	500.00	23			

*Teacher talks - 2 or 3 pupils talk - teacher talks.

TABLE 7.31 Proportion of interaction pattern T-P_{4+}-T* in pre-treatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	0.25	0.46	0.16
EG	0.88	1.25	0.44
Control	0.25	0.46	0.16

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	2.08	2	1.04	1.58	NS
Within groups	13.88	21	0.66		
Total	15.96	23			

*Teacher talks - 4 or more pupils talk - teacher talks.

TABLE 7.32 Frequency of cognitive memory teacher questions in the first posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	10.38	5.10	1.80
EG	41.50	16.11	5.69
Control	24.88	8.66	3.06

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	3881.08	2	1940.54	16.15	<.001
Within groups	2522.75	21	120.13		
Total	6403.83	23			

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: ES < C < EG.

TABLE 7.33 Frequency of convergent teacher questions in the first posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.50	2.62	0.93
EG	14.38	5.83	2.06
Control	13.00	5.66	2.00

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	283.08	2	141.54	5.83	<.01
Within groups	509.88	21	24.28		
Total	792.96	23			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: ES < C < EG

TABLE 7.34 Frequency of evaluative teacher questions in the first posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	11.75	6.54	2.31
EG	9.88	4.67	1.65
Control	7.63	4.63	1.64

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	68.25	2	34.13	1.19	NS
Within groups	602.25	21	28.68		
Total	670.50	23			

TABLE 7.35 Frequency of divergent teacher questions in the first posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	4.88	2.70	0.95
EG	1.25	1.39	0.49
Control	1.13	1.13	0.40

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	72.58	2	36.29	10.40	<.001
Within groups	73.25	21	3.49		
Total	145.83	23			

Duncan's New Multiple Range t Test.

$p = \leqslant .01$. Order of Group means: C < EG < ES.

TABLE 7.36 Frequency of grounding teacher questions in the first posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.25	3.92	1.39
EG	4.50	3.07	1.09
Control	6.25	5.70	2.02

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	16.33	2	8.17	0.43	NS
Within groups	401.00	21	19.10		
Total	417.33	23			

TABLE 7.37 Frequency of extension teacher questions in the first posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.13	4.29	1.52
EG	8.63	4.41	1.56
Control	9.38	7.01	1.48

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	46.33	2	23.17	0.80	NS
Within groups	608.63	21	28.98		
Total	654.96	23			

TABLE 7.38 Frequency of routine teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	7.63	6.35	2.24
EG	8.50	6.68	2.36
Control	9.63	12.64	4.47

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	16.08	2	8.04	0.10	NS
Within groups	1711.75	21	81.51		
Total	1727.83	23			

TABLE 7.39 Total frequency of teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	53.50	11.83	4.18
EG	88.63	24.30	8.59
Control	71.88	19.99	7.07

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	4938.58	2	2469.29	6.56	<.01
Within groups	7908.75	21	376.61		
Total	12847.33	23			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: ES < C <EG.

TABLE 7.40 Proportion of cognitive memory teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	30.25	9.24	3.27
EG	62.38	13.97	4.94
Control	52.38	11.88	4.20

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	4324.08	2	2162.04	15.38	<.001
Within groups	2951.25	21	140.5		
Total	7275.33	23			

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: ES < C < EG

TABLE 7.41 Proportion of convergent teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	19.50	7.86	2.78
EG	21.50	8.93	3.16
Control	28.13	13.32	4.71

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	326.08	2	163.04	1.53	NS
Within groups	2232.88	21	106.33		
Total	2558.96	23			

TABLE 7.42 Proportion of evaluative teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	35.15	17.44	6.17
EG	14.13	5.28	1.87
Control	16.88	10.93	3.87

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	2084.33	2	1042.17	6.92	<.01
Within groups	3160.63	21	150.51		
Total	5244.96	23			

Duncan's New Multiple Range t Test.

$p \ll .01$. Order of Group means: EG < C < ES

TABLE 7.43 Proportion of divergent teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	15.13	8.25	2.92
EG	1.75	1.98	0.70
Control	2.63	2.77	0.98

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	895.75	2	447.88	16.85	<.001
Within groups	558.25	21	26.58		
Total	1454.00	23			

Duncan's New Multiple Range t Test.

$p \ll .01$. Order of Group means: EG < C < ES

TABLE 7.44 Proportion of grounding teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	11.50	5.90	2.09
EG	5.25	3.54	1.25
Control	8.25	7.81	2.76

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	156.33	2	78.17	2.16	NS
Within groups	759.00	21	36.14		
Total	915.33	23			

TABLE 7.45 Proportion of extension teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	11.75	8.46	2.99
EG	10.50	6.35	2.24
Control	11.88	8.36	2.95

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	9.25	2	4.63	0.08	NS
Within groups	1272.38	21	60.59		
Total	1281.63	23			

TABLE 7.46 Proportion of routine teacher questions in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	13.88	10.74	3.80
EG	8.63	5.13	1.82
Control	11.63	11.02	3.90

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	111.00	2	55.50	0.63	NS
Within groups	1842.63	21	87.74		
Total	1953.63	23			

TABLE 7.47 Proportion of teacher to pupil talk in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	40.00	9.78	3.46
EG	65.38	8.75	3.09
Control	64.25	17.22	6.09

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	3288.58	2	1644.29	10.52	<.001
Within groups	3281.38	21	156.26		
Total	6569.96	23			

Duncan's New Multiple Range t Test.

$p < .01$. Order of Group means: ES < C < EG.

TABLE 7.48 Teacher inquiry score for the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	54.50	9.01	3.18
EG	28.38	8.72	3.08
Control	32.75	12.57	4.44

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	3132.58	2	1566.29	14.91	<.001
Within groups	2205.38	21	105.08		
Total	5337.96	23			

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: EG < C < ES.

TABLE 7.49 Proportion of interaction pattern $T\text{-}P_1\text{-}T^*$ in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	70.63	13.94	4.93
EG	90.25	8.70	3.07
Control	90.25	5.20	1.84

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	2054.08	2	1027.04	10.37	<.001
Within groups	2078.88	21	98.99		
Total	4132.96	23			

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: ES < EG < C.

*Teacher talks - one pupil talks - teacher talks.

TABLE 7.50 Proportion of interaction pattern $T\text{-}P_{2,3}\text{-}T^{*}$ in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	22.25	10.54	3.73
EG	8.75	7.27	2.57
Control	9.50	4.90	1.73

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	921.00	2	460.50	7.35	<.01
Within groups	1315.00	21	62.62		
Total	2236.00	23			

Duncan's New Multiple Range t Test.

$p < .01$. Order of Group means: EG < C < ES.

*Teacher talks - 2 or 3 pupils talk - teacher talks.

TABLE 7.51 Proportion of interaction pattern $T\text{-}P_{4+}\text{-}T^{*}$ in the immediate posttreatment lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.88	5.28	1.87
EG	0.75	1.16	0.41
Control	0.25	0.46	0.16

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	217.75	2	108.88	11.11	<.001
Within groups	205.88	21	9.80		
Total	423.63	23			

Duncan's New Multiple Range t Test.

$p < .01$. Order of Group means: C < EG < ES.

*Teacher talks - 4 or more pupils talk - teacher talks.

TABLE 7.52 Frequency of cognitive memory teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	15.29	11.00	4.16
EG	37.75	13.40	4.74
Control	25.57	8.90	3.37

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	1897.72	2	948.86	7.33	<.01
Within groups	2458.64	19	129.40		
Total	4356.36	21			

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: ES < C < EG

TABLE 7.53 Frequency of convergent teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	8.14	4.14	1.56
EG	18.50	11.24	3.97
Control	16.29	5.19	1.96

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	433.21	2	216.61	3.58	<.05
Within groups	1148.29	19	60.44		
Total	1581.50	21			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: ES < C < EG.

TABLE 7.54 Frequency of evaluative teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	12.57	5.00	1.89
EG	12.25	4.83	1.71
Control	8.14	2.79	1.06

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	86.88	2	43.44	2.29	NS
Within groups	360.07	19	18.95		
Total	446.95	21			

TABLE 7.55 Frequency of divergent teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	4.29	3.30	1.25
EG	1.63	1.60	0.56
Control	0.57	1.13	0.43

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	51.57	2	25.79	5.38	<.05
Within groups	91.02	19	4.79		
Total	142.59	21			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: C < EG < ES.

TABLE 7.56 Frequency of grounding teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	5.00	4.76	1.80
EG	4.00	3.07	1.09
Control	5.43	2.64	1.00

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	8.15	2	4.07	0.32	NS
Within groups	243.71	19	12.83		
Total	251.86	21			

TABLE 7.57 Frequency of extension teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.00	2.00	0.76
EG	6.88	4.88	1.73
Control	12.57	6.53	2.47

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	180.73	2	90.36	3.84	<.05
Within groups	446.59	19	23.50		
Total	627.32	21			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: ES < EG < C.

TABLE 7.58 Frequency of routine teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.86	3.85	1.45
EG	12.88	9.93	3.51
Control	7.00	8.45	3.19

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	180.09	2	90.04	1.42	NS
Within groups	1207.73	19	63.56		
Total	1387.82	21			

TABLE 7.59 Total frequency of teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	58.14	23.02	8.70
EG	93.88	29.14	10.30
Control	75.57	17.36	6.56

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	4779.33	2	2389.66	4.15	<.05
Within groups	10929.45	19	575.23		
Total	15708.78	21			

Duncan's New Multiple Range t Test.

$p \leqslant .05$. Order of Group means: ES < C < EG.

TABLE 7.60 Proportion of cognitive memory teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	33.86	11.51	4.35
EG	53.75	13.57	4.80
Control	49.14	9.01	3.40

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	1581.74	2	790.87	5.84	<.01
Within groups	2571.21	19	135.33		
Total	4152.95	21			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: ES < C < EG.

TABLE 7.61 Proportion of convergent teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	19.86	7.54	2.85
EG	25.25	12.26	4.33
Control	32.86	7.80	2.95

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	597.74	2	298.87	3.23	NS
Within groups	1757.21	19	92.48		
Total	2354.95	21			

TABLE 7.62 Proportion of evaluative teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	30.29	6.90	2.61
EG	18.50	9.37	3.31
Control	17.14	7.17	2.71

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	742.99	2	371.49	5.84	<.01
Within groups	1208.29	19	63.59		
Total	1951.28	21			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: C < EG < ES.

TABLE 7.63 Proportion of divergent teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	12.57	11.83	4.47
EG	2.50	2.56	0.91
Control	0.86	1.57	0.59

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	570.70	2	285.35	6.02	<.01
Within groups	900.57	19	47.40		
Total	1471.27	21			

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: C < EG < ES.

TABLE 7.64 Proportion of grounding teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	7.57	4.31	1.63
EG	4.13	3.40	1.20
Control	7.71	4.68	1.77

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	63.07	2	31.54	1.85	NS
Within groups	324.02	19	17.05		
Total	387.09	21			

TABLE 7.65 Proportion of extension teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	11.14	4.74	1.79
EG	6.63	3.77	1.34
Control	16.29	8.20	3.10

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	348.43	2	174.22	5.19	<.05
Within groups	638.16	19	33.59		
Total	986.59	21			

Duncan's New Multiple Range t Test.

$p \leqslant .01$. Order of Group means: EG < ES < C.

TABLE 7.66 Proportion of routine teacher questions in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	12.29	9.88	3.73
EG	12.88	7.43	2.63
Control	8.14	8.57	3.24

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	96.11	2	48.06	0.65	NS
Within groups	1413.16	19	74.37		
Total	1509.27	21			

TABLE 7.67 Proportion of teacher to pupil talk in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	36.00	13.43	5.08
EG	66.00	11.33	4.00
Control	65.43	13.31	5.03

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	4220.65	2	2110.32	13.17	<.001
Within groups	3043.71	19	160.20		
Total	7264.36	21			

Duncan's New Multiple Range t Test

$p \leqslant .01$. Order of Group means: ES < C < EG.

TABLE 7.68 Teacher inquiry score for delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	50.14	11.42	4,32
EG	27.13	7.90	2.79
Control	35.71	10.03	3.79

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	2000.11	2	1000.06	10.42	<•001
Within groups	1823.16	19	95.96		
Total	3823.27	21			

Duncan's New Multiple Range t Test.

$p \leqslant .05$. Order of Group means: EG < C < ES.

TABLE 7.69 Proportion of interaction pattern $T\text{-}P_1\text{-}T^*$ in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	71.57	12,55	4.75
EG	91.50	6.14	2.17
Control	91.71	5.94	2.24

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	1914.72	2	957.36	12.80	<•001
Within groups	1421.14	19	74.80		
Total	3335.86	21			

Duncan's New Multiple Range t Test.

$p \leqslant .01$. Order of Group means: ES < EG < C.

*Teacher talks - one pupil talks - teacher talks.

TABLE 7.70 Proportion of interaction pattern T-$P_{2,3}$-T* in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	22.43	9.47	3.58
EG	8.25	6.04	2.14
Control	7.43	5.19	1.96

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	1014.57	2	507.29	10.09	<.01
Within groups	954.93	19	50.26		
Total	1969.50	21			

Duncan's New Multiple Range t Test.

p <.01. Order of Group means: C < EG < ES.

*Teacher talks - 2 or 3 pupils talk - teacher talks.

TABLE 7.71 Proportion of interaction pattern T-P_{4+}-T* in delayed lesson: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	6.00	4.24	1.60
EG	0.38	0.52	0.18
Control	0.86	1.57	

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	140.04	2	70.02	10.67	<.001
Within groups	124.73	19	6.56		
Total	264.77	21			

Duncan's New Multiple Range t Test.

p <.01. Order of Group means: EG < C < ES

* Teacher talks - 4 or more pupils talk - teacher talks.

TABLE 7.72 Pretreatment Rokeach Dogmatism, Form E: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	150.63	24.00	8.49
EG	145.38	13.77	4.87
Control	155.25	17.98	6.36

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	390.58	2	195.29	0.54	NS
Within groups	7623.25	21	363.01		
Total	8013.83	23			

TABLE 7.73 Posttreatment Rokeach Dogmatism, Form E: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	150.43	20.65	7.81
EG	148.25	19.90	7.03
Control	148.29	16.29	6.16

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	22.31	2	11.16	0.03	NS
Within groups	6922.64	19	364.35		
Total	6944.95	21			

TABLE 7.74 Pretreatment Zevin Attitude-to-Inquiry Scale: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	94.13	7.34	2.59
EG	99.25	3.11	1.10
Control	93.38	9.40	3.32

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	163.58	2	81.79	1.62	NS
Within groups	1062.25	21	50.58		
Total	1225.83	23			

TABLE 7.75 Posttreatment Zevin Attitude-to-Inquiry Scale: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	95.71	9.16	3.46
EG	99.00	3.70	1.31
Control	95.57	6.24	2.36

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	57.45	2	28.72	0.66	NS
Within groups	833.14	19	43.85		
Total	890.59	21			

TABLE 7.76 Means, standard errors, and standard deviations for pretest (Tonga) achievement subtests for pupils of Experimental Groups and Control Group.

Pretest Subtest	Pupil group	Mean	Standard error	Standard deviation
Cognitive memory	ES (N=194)	6.22	0.10	1.37
	EG (N=155)	5.85	0.12	1.47
	C (N=174)	5.59	0.11	1.41
Higher order thinking	ES	11.40	0.20	2.73
	EG	10.74	0.21	2.60
	C	10.63	0.22	2.91
Evaluative thinking	ES	7.49	0.34	4.68
	EG	8.07	0.28	3.53
	C	8.93	0.28	3.67
Divergent thinking	ES	10.51	0.28	3.88
	EG	12.27	0.42	5.24
	C	12.91	0.45	5.87

TABLE 7.77 Means, standard errors, and standard deviations for the immediate posttreatment (Hopi) achievement subtests for pupils of Experimental Groups and Control Group.

Posttest One subtest	Pupil group	Mean	Standard error	Standard deviation
Cognitive memory	ES (N=194)	5.42	0.12	1.61
	EG (N=155)	5.45	0.13	1.59
	C (N=174)	5.56	0.17	1.41
Higher order thinking	ES	10.63	0.28	3.88
	EG	9.85	0.28	2.84
	C	9.93	0.20	2.63
Evaluative thinking	ES	8.71	0.44	6.16
	EG	8.23	0.30	3.71
	C	8.40	0.31	4.04
Divergent thinking	ES	11.45	0.36	5.04
	EG	11.08	0.42	5.27
	C	11.60	0.43	5.65

TABLE 7.78 Means, standard errors, and standard deviations for the delayed posttreatment (Temiar) achievement subtests for pupils of Experimental Groups and Control Group.

Posttest Two subtest	Pupil group	Mean	Standard error	Standard deviation
Cognitive memory	ES (N=171)	5.70	0.12	1.62
	EG (N=155)	5.54	0.14	1.70
	C (N=157)	5.77	0.12	1.53
Higher order thinking	ES	10.19	0.30	3.89
	EG	9.60	0.23	2.84
	C	9.38	0.20	2.56
Evaluative thinking	ES	8.95	0.41	5.42
	EG	7.39	0.24	2.99
	C	7.53	0.29	3.60
Divergent thinking	ES	13.29	0.45	5.84
	EG	9.21	0.39	4.85
	C	10.11	0.44	5.55

TABLE 7.79 Analysis of covariance: comparison of groups on the immediate posttreatment cognitive memory subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	1.65	2	0.82	12.41	2	6.20	3.17	<.05
Within groups	1242.96	520	2.39	1010.78	517	1.96		
Total	1244.61	522	2.38					

Duncan's New Multiple Range t Test.

$p \leq .05$. Order of Group means: ES < EG < C.

*Covariates were I.Q., PAT Reading Comprehension, and Pretest Cognitive memory subtest scores.

TABLE 7.80 Analysis of covariance: comparison of groups on immediate posttreatment Higher-order thinking subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	36.51	2	18.25	6.44	2	3.22	0.83	NS
Within groups	3793.09	520	7.29	2015.70	517	3.90		
Total	3829.60	522	7.34					

*Covariates were I.Q., PAT Reading Comprehension, and pretest Higher-order thinking subtest scores.

TABLE 7.81 Analysis of covariance: comparison of groups on immediate posttreatment Evaluation subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	15.53	2	7.76	149.76	2	74.88	8.98	<.001
Within groups	11711.44	520	22.52	4326.53	519	8.34		
Total	11726.97	522	22.47					

Duncan's New Multiple Range t Test.

$p < .05$. Order of Group means: C < EG < ES.

*Covariate was pretest Evaluation subtest.

TABLE 7.82 Analysis of covariance: comparison of groups on immediate posttreatment Divergent subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	22.15	2	11.08	280.61	2	140.30	9.14	<.001
Within groups	14593.41	520	28.06	7966.50	519	15.35		
Total	14615.56	522	28.00					

Duncan's New Multiple Range t Test.

$p < .01$. Order of Group means: EG < C < ES.

*Covariate was pretest Divergent subtest.

TABLE 7.83 Analysis of covariance: comparison of groups on delayed Cognitive memory subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	3.37	2	1.69	7.27	2	3.64	1.71	NS
Within groups	1240.27	477	2.60	1008.84	474	2.13		
Total	1243.64	479	2.60					

*Covariates were I.Q., PAT Reading Comprehension and pretest Cognitive memory subtest scores.

TABLE 7.84 Analysis of covariance: comparison of groups on delayed Higher-order thinking subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	27.36	2	13.68	1.11	2	0.56	0.13	NS
Within groups	3241.90	480	6.75	2025.83	477	4.25		
Total	3269.26	482	6.78					

*Covariates were I.Q., PAT Reading Comprehension and pretest Higher-order thinking subtest scores.

TABLE 7.85 Analysis of covariance: comparison of groups on delayed Evaluative subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	155.41	2	77.71	415.28	2	207.64	28.69	<.001
Within groups	5337.79	477	11.19	3445.01	476	7.24		
Total	5493.20	479	11.47					

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: C < EG < ES.

*Covariate was pretest Evaluative subtest scores.

TABLE 7.86 Analysis of covariance: comparison of groups in delayed Divergent subtest.*

	SS	d.f.	MS	SS	d.f.	MS	F	p
Between groups	1490.16	2	745.08	2738.45	2	1369.22	73.04	<.001
Within groups	14343.80	477	30.07	8922.67	476	18.75		
Total	15833.96	479	33.06					

Duncan's New Multiple Range t Test.

$p \leq .01$. Order of Group means: EG < C < ES

*Covariate was pretest Divergent subtest scores.

TABLE 7.87 Means, standard errors, and standard deviations for pretest and posttest Inference and Caution scores for pupil groups.

Pupil group	Measure	Inference		Caution	
		Pretest	Posttest	Pretest	Posttest
ES (N=171)	Mean	52.18	54.05	44.52	44.15
	S. Error	2.13	2.16	1.82	1.79
	S.D.	27.88	28.22	23.86	23.35
EG (N=155)	Mean	47.68	49.59	46.27	46.86
	S. Error	2.32	2.34	2.10	2.01
	S.D.	28.84	29.07	26.10	25.17
Control (N=157)	Mean	49.14	47.03	43.18	41.06
	S. Error	2.19	2.29	1.95	1.92
	S.D.	27.20	28.68	24.38	24.01

TABLE 7.88 Means, standard errors, and standard deviations (Otis Intelligence Quotient, PAT Reading Comprehension level and age) for pupils in Experimental Groups and Control Group.

Variable	Pupil group	Mean	Standard error	Standard deviation
Otis Intermediate Intelligence Quotient	ES (N=194)	104.60	1.01	14.02
	EG (N=155)	101.21	1.19	14.86
	C (N=174)	97.71	1.12	14.72
PAT Reading Comprehension (levels)	ES	7.19	0.14	1.99
	EG	6.54	0.17	2.15
	C	6.47	0.16	2.05
Age (months)	ES	140.96	0.58	8.03
	EG	140.45	0.62	7.75
	C	143.85	0.64	8.42

TABLE 7.89 Pretest Inference Scores: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	52.26	27.77	2.12
EG	47.68	28.84	2.13
Control	49.14	27.20	2.17

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	1794.75	2	897.37	1.15	NS
Within groups	374633.11	480	780.49		
Total	376427.86	482			

TABLE 7.90 Posttest Inference Scores: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	54.10	28.17	2.15
EG	49.59	29.07	2.34
Control	47.03	28.68	2.29

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	4236.88	2	2118.44	2.59	NS
Within groups	393333.58	480	819.44		
Total	397570.46	482			

TABLE 7.91 Pretest Caution Scores: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	44.99	23.91	1.83
EG	46.27	26.10	2.10
Control	43.18	24.38	1.95

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	750.99	2	375.50	0.61	NS
Within groups	294794.24	480	614.15		
Total	295545.23	482			

TABLE 7.92 Posttest Inference Scores: mean scores, standard deviations, and standard error of the means.

Group	Mean	S.D.	S.E. of mean
ES	44.13	23.32	1.78
EG	46.86	25.17	2.02
Control	41.06	24.01	1.92

Analysis of variance

	sums of squares	d.f.	mean squares	F ratio	p
Between groups	2628.50	2	1314.25	2.25	NS
Within groups	279943.42	480	583.22		
Total	282571.92	482			

TABLE 7.93 Intercorrelations of covariate and test score variables.

	PAT	IQ	CM_1	HO_1	E_1	D_1	CM_2	HO_2	E_2	D_2	CM_3	HO_3	E_3	D_3
PAT	.	.72	.32	.66	.36	.36	.40	.63	.41	.43	.41	.54	.40	.38
IQ	.72	.	.27	.63	.36	.33	.34	.58	.44	.43	.34	.54	.49	.37
CM_1	.32	.27	.	.28	.08	.05	.16	.23	.16	.10	.15	.17	.13	.16
HO_1	.66	.63	.28	.	.33	.32	.38	.60	.40	.46	.38	.55	.38	.38
E_1	.36	.36	.08	.33	.	.69	.17	.31	.63	.57	.16	.31	.54	.46
D_1	.36	.33	.05	.32	.69	.	.18	.31	.62	.66	.17	.31	.54	.51
CM_2	.40	.34	.16	.38	.17	.18	.	.41	.26	.24	.32	.32	.17	.14
HO_2	.63	.58	.23	.60	.31	.31	.41	.	.38	.41	.32	.57	.31	.32
E_2	.41	.44	.16	.40	.63	.62	.26	.38	.	.68	.24	.40	.63	.57
D_2	.43	.43	.10	.46	.57	.66	.24	.41	.68	.	.22	.41	.63	.66
CM_3	.41	.34	.15	.38	.16	.17	.32	.32	.24	.22	.	.43	.14	.20
HO_3	.54	.54	.17	.55	.31	.31	.32	.57	.40	.41	.43	.	.38	.38
E_3	.40	.40	.13	.38	.54	.54	.17	.31	.63	.63	.15	.38	.	.72
D_3	.38	.37	.16	.38	.46	.51	.14	.32	.57	.66	.20	.38	.72	.

KEY:

PAT = PAT Reading Comprehension levels.

IQ = Otis Intermediate Intelligence Quotient.

CM_1, CM_2, CM_3 = Cognitive memory subtest scores (pretest to delayed).

HO_1, HO_2, HO_3 = Higher-order thinking subtest scores (pretest to delayed).

E_1, E_2, E_3 = Evaluative thinking subtest scores (pretest to delayed).

D_1, D_2, D_3 = Divergent thinking subtest scores (pretest to delayed).

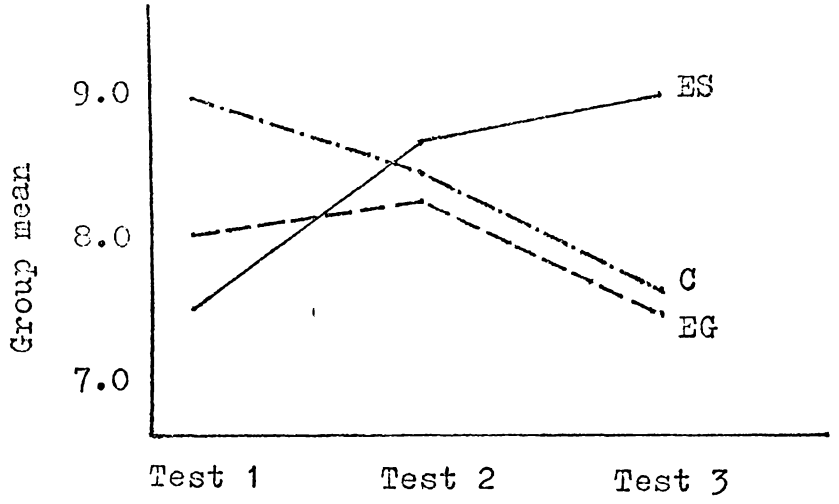

Figure 1: Mean scores for Evaluative thinking subtests for ES, EG, and C pupils.

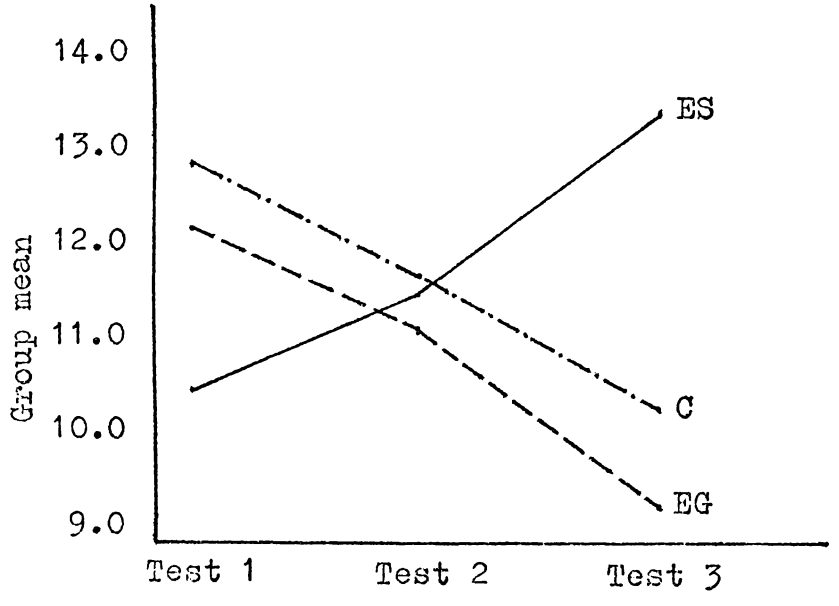

Figure 2: Mean scores for Divergent thinking subtests for ES, EG, and C pupils.

APPENDIX A

Sensitization — Practice — Review
In-service Training Experience : SPRITE

The SPRITE programme was carried out in the following way:

DAY 1

1. The teachers were given the two attitude scales related to the research design outlined in Volume One: the Rokeach Dogmatism Scale, Form E, and the Zevin Attitude-to-Inquiry Scale. This took about 20 minutes.

2. The purpose of the in-service programme was briefly outlined to the course members, viz., to study some of the recent developments in the teaching of social studies and to develop a repertoire of teaching skills appropriate for implementing such changes. In particular, inquiry teaching and teacher questioning were identified as two areas upon which considerable stress would be placed.

It was pointed out to the teachers that through the SPRITE programme, it was hoped to provide an opportunity for open-ended discussion and debate about inquiry teaching and teacher questioning.

3. A lecture was given on recent developments in the field of social studies teaching. The topics were as follows:

a. Changes in content which have resulted from an increased use of concepts from various social science disciplines and the 'knowledge explosion'. Reference was made to Fraenkel (1969).

b. There has been an increasing consideration of the thought processes of children. Inquiry teaching and learning relates to critical thinking, problem solving, and creative thinking.

c. There is an increasing emphasis upon the teaching of attitudes and values through open-ended inquiry techniques

which means that teachers must learn discussion skills such as questioning.

d. Along with the above changes there have been innovations in instructional resources.

In dealing with the above topics the approach was for the course instructor to raise issues and invite discussion by the course members. It was believed that this approach would be more conducive to inquiry than if the lecture were presented formally with the instructor dominating both the talk and the flow of ideas.

4. It was pointed out that in order to develop inquiry teaching and learning, both teachers and pupils need to exhibit particular skills and behaviours. To exemplify this a filmstrip from the open-ended series (see reading list) on values teaching was shown. A discussion with course members followed which looked at how teachers could effectively get open-ended discussion in social studies.

A 'brainstorming' technique was used to get the teachers to put down what they considered to be the characteristics of 'an inquiry teacher' and of pupils who were taught by inquiry. The resulting lists were compared and debated, and in turn, compared with lists by various writers on inquiry (Postman and Weingartner, 1969; Ryan, 1969; Zevin, 1969; Lawton *et al.*, 1971; Massialas, Sprague and Hurst, 1975).

5. The course instructor had assembled a variety of large photographs which related to topics from the Intermediate School-level social studies syllabus. The teachers each selected one of these and attempted to formulate a 10-minute teaching sequence which would reflect the characteristics of 'inquiry teachers' and 'inquiry learners' which they had previously identified.

On completion, each sequence was examined. The teacher explained what his specific objectives were and how he would pose questions to get the pupils to discuss so that they might reach the objectives. The instructor's intention was to get the teachers to become more aware of various kinds of questions that might be suitable for inquiry discussions.

6. The instructor issued the reading *The Inquiry Method* (Chapter 3) by Postman and Weingartner (1969, pp.36-47). The teachers were asked to read the notes before the next day's programme because it summed

up much of what had been said about inquiry teaching during the day.

7. The teachers were shown the reference materials on inquiry teaching and questioning that were assembled in the room. Borrowing procedures were outlined. A list of these materials is given below.

DAY 2

1. A discussion was held on Chapter 3 of Postman and Weingartner (1969). Attention was drawn to the stress upon the processes of learning rather than upon accumulated factual information.

2. The question classification system was outlined (see Appendix B). This was done in a systematic, sequential way. Each question type was studied in turn and examples were given from social studies. Lists of questions were issued for practice in classifying.

At this stage concentration was upon 'initial' questions: Cognitive memory, Convergent, Divergent, Evaluative and Routine. Transcripts from Massialas and Zevin (1967) were used to practice identifying question types. This was done as follows. Each teacher coded his own copy, then the group discussed each question in turn.

It was shown how the Evaluative and Divergent questions could be phrased in such a way that they allowed children to give various answers which were not necessarily preconceived by the teacher.

3. The teachers were told that there was probably merit in trying out their own questioning procedures in their usual classrooms before they attended the next (third) day a week later. Therefore, they were asked to prepare a 10-minute teaching sequence (class discussion) in social studies which reflected what they saw as 'an inquiry discussion'. Time was given for the preparation of these sequences using photographs similar to those used on the previous day. The sequences were to be discussed with groups of 10-12 pupils.

The teachers were asked to try to build in a variety of questions that would get their pupils to engage in a wider range of thought processes.

Arrangements were then made for the sequences to be taperecorded so that they could be listened to and discussed during the third day of the SPRITE programme. Where necessary, equipment was issued and instructions given about its use.

DAY 3

1. About two-thirds of this day was spent reviewing the teaching sequences referred to above. The procedure for each recording was as follows. The taperecorded lesson was played to the group as a whole. Each teacher attempted to classify each teacher question into one of the types which had been previously identified: Cognitive memory, Convergent, Divergent, Evaluative, and Routine. After the play-through, the tallies were compared. When queries were raised about a particular question type, that segment of the tape was replayed, and further discussion took place.

The SPRITE instructor's role was to draw the teachers' attention to various points during this review phase. For example, the effects of 'wait time' on discussion; pupil reaction to Divergent and open questions when they were unused to these being asked by the teachers; how to overcome a few pupils dominating a group or class discussion; whether or not knowledge is learned effectively when fewer Cognitive memory questions are asked; whether or not a teacher should always know the answer to every question he asks.

2. It was pointed out to the teachers that so far attention had been focussed upon 'initial' teacher questions, and that another important aspect of inquiry teaching and learning was the asking of 'follow-up' questions which required pupils to develop answers to initial questions in a variety of ways. A diagram "Opining and Inquiry Sequences" (Massialas and Sprague, 1974, p.19) was used as the basis for a lecture/discussion on techniques of getting pupils to use skills such as opining, clarification, probing and grounding in inquiry-based social studies discussions. Transcripts from the same article were used to identify examples of these skills. In addition, examples from Allen *et al.* (1969, pp.20-21) and Taba *et al.* (1971) were used.

Some practice of these kinds of follow-up questions was given by listening to a taperecording of one of the teachers' lessons (above) and seeing whether there was scope for asking a follow-up question at any given point of the lesson.

DAY 4

1. The instructor explained a range of instructional resources that had been assembled in the seminar room being used for the SPRITE

programme. These included slide-tape sequences and pupil textbooks. Some of the audio-visual materials were shown to the teachers and discussion was held as to how these cross-cultural materials might be used in inquiry-based lessons.

These instructional materials were similar to those used by the teachers in the in-service programme of a more general nature (Experimental Group Two or General) which is outlined below. Some discussion was held about the availability of such materials and how they related to topics and themes of the Draft Forms One to Four Social Studies Syllabus.

2. Some time (about 50 minutes) was spent on inferential thinking in social studies. It was pointed out that this kind of thinking was important in inquiry-based teaching and learning and that it is usually related to the notion of tentativeness, where children are encouraged to make 'educated guesses' about some of the problems they study.

The teachers were shown a photograph of a Polynesian-type village and asked to say whether or not statements about the photograph were probably true, probably not true, or could not be ascertained from the information given. The intention was to indicate to teachers that what they (the teachers) see as 'correct' may differ from what the children think and that this should be taken into account when asking questions.

3. The initial and follow-up question types which had been introduced and studied during the previous days were revised. Definitions of the questions were re-stated and examples of each given as reminders.

Further practice in formulating these questions was carried out in the following way. A brief excerpt (8 minutes) from a movie film about an African community was shown and the teachers devised a list of questions (individually) which they considered would be suitable as the basis for an inquiry-based discussion with their pupils. Then, by a process of analysing each teacher's questions, group discussion was held as to whether or not pupils' higher-order thinking skills would be developed by such questions. In some cases, alterations were made, such as to reduce the number of Cognitive memory questions where the group as a whole considered that action to be desirable.

4. A lecture was given to summarise the teaching skills which had been

studied during the previous three days of the SPRITE programme.

5. Teachers were given details of the investigator's intention to record a class discussion in each classroom during the two weeks following the SPRITE programme. Arrangements were made for the times and dates of the recordings.

The lesson materials (on Hopi Indians) were given to the teachers (objectives, broad concepts, and teacher notes) and the television presentation which had been prepared by the investigator was shown. It was pointed out that the procedures for recording and pupil testing were the same as for the first (Tonga) lesson.

6. The teachers completed an evaluation form. They were asked to make full, frank comments. They were assured that the comments would be confidential and this was ensured because no names appeared on the forms.

In summary, the SPRITE programme attempted to offer to the participants a range of questioning skills related to inquiry teaching and learning. To do this the teachers were sensitized to each skill which had been specifically defined and illustrated by examples. Opportunities were then provided for the practice of these skills both during the in-service programme and in each teacher's classroom. The practice was reviewed systematically by getting the teachers to analyse and comment on their own and others' performance. As a result of the review there were chances to modify teaching behaviours.

The In-service Programme on Inquiry: General

The following is an outline of the in-service programme of four days duration which was given to the teachers in Experimental Group Two (General).

DAY 1

1. The teachers were given the two attitude scales related to the research design outlined in Volume One: the Rokeach Dogmatism Scale, Form E, and the Zevin Attitude-to-Inquiry Scale. This took about 20 minutes.

2. The purpose of the in-service programme was briefly outlined, viz., to study some of the recent developments in the teaching of social studies, and inquiry teaching and learning in particular.

3. A lecture was given on recent developments in the field of social studies teaching. The topics were as follows:

   a. Changes in content which have resulted from an increased use of concepts from various social science disciplines and the 'knowledge explosion'. Reference was made to Fraenkel (1969).
   b. There has been an increasing consideration of the thought processes of children. Inquiry teaching and learning relates to critical thinking, problem solving, and creative thinking.
   c. There is an increasing emphasis upon the teaching of attitudes and values through open-ended inquiry techniques which means that teachers must learn discussion skills such as questioning.
   d. Along with the above changes there have been innovations in instructional resources.

Whereas in the SPRITE course (outlined above) the approach was to raise questions and invite discussion, the method in this programme was to present a formal lecture. It will be noted, however, that the content covered was the same for both groups of teachers.

4. Another lecture was given on the characteristics of an 'inquiry' teacher. This included a presentation of the lists of Zevin (1969) and Postman and Weingartner (1969). Reference was made to transcripts

from Massialas and Zevin (1969) which showed inquiry lessons in social studies. It was recommended that the teachers study these in more detail by taking copies of them (which were available).

5. The teaching of attitudes and values was used as an example of the role of the social studies teacher in developing inquiry-based classroom discussions. Two sets of materials were shown to the teachers: the open-ended series of filmstrips and *Lifeline* cards. A discussion was conducted on what use such materials might be in inquiry lessons.

6. Cross-cultural instructional materials were then shown to the teachers as examples of aids which could form the basis of inquiry-based lessons. These were slide-tape sequences and the procedures for constructing them were explained. The teachers were asked to comment on the usefulness of the materials for inquiry lessons.

7. The teachers were asked to begin developing teaching sequences which would reflect the aspects of inquiry teaching referred to in the lectures they were given earlier in the day. It was indicated that they would be asked to teach these in the days between their in-service attendance.

DAY 2

1. The readings held in the seminar room being used for the programme were pointed out to the teachers and they were invited to borrow any materials to read and study. These were the same materials shown to the SPRITE programme teachers. The cyclostyled notes on questioning (Appendix B) and Postman and Weingartner's (1969) Chapter 3 were issued.

2. Using resources on Indian villages, the instructor gave a lecture to indicate the importance of the teacher as a facilitator of inquiry learning in his pupils. It was argued that this can best be done through discussion and that the asking of questions is particularly important.

3. Two workshop sessions were held. In one of these, the teachers were given technical details of how to utilize audio-visual aids such as synchrocorders in constructing instructional materials. Demonstrations were given about how to produce mounted photographic slides and link these to sound tracks as a means of presenting information to

to their classes.

The second workshop was a continuation of the one begun on the previous day. The teachers selected a topic from the Draft Social Studies Syllabus (Forms One to Four) and worked on an instructional sequence which they would try out with their class. It was intended that the techniques learned in the first workshop would be utilized here. Also, the sequence was intended to form the basis of an inquiry-based discussion. By the end of the second day these sequences were completed. Arrangements were made for each teacher to taperecord a discussion with a small group of pupils after they had viewed (and listened to) the sequence. As for the SPRITE programme teachers, the teachers were told that the tapes would be studied on the third day.

DAY 3

1. The morning session was taken up by the playing and discussion of the taperecordings of the lessons referred to above. The procedure for each teacher's tape was as follows. The group was shown the instructional sequence and then listened to the taperecording of the ensuing discussion conducted by the teacher with his own class. The teachers and the instructor discussed whether or not the discussion reflected an inquiry approach in terms of what was said by both the teacher and the pupils.

When all tapes had been heard the teachers were shown the Zevin (1969) list of characteristics of an 'inquiry' teacher. This was presented in lecture form with little discussion by the course members.

2. A lecture was given (by an educator in Audio-visual Education) on how the overhead projector can be used as a discussion aid in social studies.

3. Another lecture was given on how games, role play and simulation can be used to promote inquiry in social studies. Some examples of games were shown and opportunity was given for the course teachers to briefly play one of the simpler ones.

DAY 4

1. The instructor again referred to the resource materials relating to social studies which were collected in the seminar room being used.

Particular reference was made to the notes and books on inquiry techniques and teacher questioning.

2. Most of the remainder of the day was spent in a workshop setting in which the teachers were asked to develop instructional sequences that reflected inquiry, related to the Draft Syllabus, and were appropriate for use in their own classrooms.

This was begun by the instructor giving a short lecture. Published audio-visual materials were referred to (and in some cases samples shown) which had been designed to reflect inquiring teaching approaches. The advantages and disadvantages of these were given.

3. The teachers were given details of the lesson on Hopi Indians which was to be taperecorded in each classroom during the two weeks following the in-service programme. Suitable times and dates were arranged for the lessons and the achievement tests. The objectives, broad concepts and teacher notes for the lesson were issued and discussed, and the television materials were viewed and discussed.

4. An evaluation form was completed by each teacher and, as for the SPRITE teachers, confidentiality was assured and full, frank comments asked for.

Summarising, the above course was intended to deal with inquiry teaching and learning in social studies. However, while the same readings and materials about inquiry and questioning were presented to these teachers and the SPRITE programme teachers, in the above course the references to inquiry were not followed-up by concentrated practice in using particular skills. Instead, skills such as teacher questioning were referred to in lecture situations and the teachers were left to transfer this information into their own teaching on their own initiative.

RESOURCES

The following materials were held in the seminar room during both the in-service programmes reported above.

TEACHING AND INQUIRY

Amidon, E.J. and Hunter, E. (1967) Improving Teaching. New York: Holt, Rinehart and Winston.

Massialas, B.G. and Zevin, J. (1968) Creative Encounters in the Classroom. New York: John Wiley and Sons.

Postman, N. and Weingartner, C. (1969) Teaching as a Subversive Activity. Middlesex, England: Penguin.

SOCIAL STUDIES/SOCIAL SCIENCE TEXTBOOKS

Barnes, D.L. and Burgdorf, A.B. (1969) New Approaches to Teaching Elementary Social Studies. Minneapolis: Burgess.

Beyer, B.K. (1971) Inquiry in the Social Studies Classroom. Columbus, Ohio: Charles E. Merrill.

Bridges, D. and Scrimshaw, P. (Eds.) (1975) Values and Authority in Schools. London: Hodder and Stoughton.

Carpenter, H.M. (Ed.) (1963) Skill Development in Social Studies: Thirty-third Yearbook. Washington: National Council for the Social Studies.

De Fleur, M.L., D'Antonio, W.V., De Fleur, L.B. (1971) Sociology: Man in Society. Illinois: Scott, Foresman.

Dunfee, M. and Sagl, H. (1966) Social Studies Through Problem Solving. New York: Holt, Rinehart and Winston.

Education, 25 (5), 1976: The Social Studies Kitsets, p.3-11.

Estvan, F.J. (1968) Social Studies in a Changing World. New York: Harcourt, Brace and World.

Fraser, D.M. (Ed.) (1969) Social Studies Curriculum Development: Thirty-ninth Yearbook. Washington: National Council for the Social Studies.

Jarolimek, J. and Walsh, H.M. (Eds.) (1974) Readings for Social Studies in Elementary Education. New York: Macmillan.

Joyce, B.R. (1965) Strategies for Elementary Social Science Education. Chicago: Science Research Associates.

Kenworthy, L.S. (1969) Social Studies for the Seventies. Massachusetts: Ginn and Company.

McLendon, J.C., Joyce, W.W., Lee, J.R. (Eds.) (1970) Readings on Elementary Social Studies: Emerging Changes. Boston: Allyn and Bacon.

Mallan, J.T. and Hersh, R. (1972) No G.O.D.s in the Classroom: Inquiry into Inquiry. Philadelphia: W.B. Saunders.

Mallan, J.T. and Hersh, R. (1972) No G.O.D.s in the Classroom: Inquiry and Elementary Social Studies. Philadelphia: W.B. Saunders.

Mallan, J.T. and Hersh, R. (1972) No G.O.D.s in the Classroom: Inquiry and Secondary Social Studies. Philadelphia: W.B. Saunders.

Massialas, B.G. and Cox, C.B. (1966) Inquiry in Social Studies. New York: McGraw-Hill.

Massialas, B.G., Sprague, N.F., Hurst, J.B. (1975) Social Issues Through Inquiry: Coping with an Age of Crisis. New Jersey: Prentice-Hall.

Michaelis, J.U. (1974) Social Studies for Children in a Democracy. New Jersey: Prentice-Hall.

Ploghoft, M.E. and Shuster, A.H. (1971) Social Science Education in the Elementary School. Ohio: Charles E. Merrill.

Raths, L.E., Harmin, M., Simon, S.B. (1966) Values and Teaching: Working with Values in the Classroom. Ohio: Charles E. Merrill.

Ryan, F.L. (1971) Exemplars for the New Social Studies. New Jersey: Prentice-Hall.

Ryan, F.L. and Ellis, A.K. (1974) Instructional Implications of Inquiry. New Jersey: Prentice-Hall.

Shaftel, F.R. and Shaftel, G. (1967) Role-Playing for Social Values. New Jersey: Prentice-Hall.

Schusky, E.L. and Culbert, T.P. (1973) Introducing Culture. New Jersey: Prentice-Hall.

Taba, H., *et al.* (1971) A Teacher's Handbook to Elementary Social Studies: An Inductive Approach. Massachusetts: Addison-Wesley.

Thomas, R.M. and Brubacher, D.L. (1971) Curriculum Patterns in Elementary Social Studies. California: Wadsworth.

Thomas, R.M. and Brubacher, D.L. (1971) Decisions in Teaching Elementary Social Studies. California: Wadsworth.

Thomas, R.M. and Brubacher, D.L. (Eds.) (1972) Teaching Elementary Social Studies: Readings. California: Wadsworth.

Thomas, W.L. and Norton, J.H. (1972) Studying Man in Society: A Student's Guide to Sociology: Man in Society. Illinois: Scott, Foresman.

Traill, R.D., Logan, L.M., Rimmington, G.T. (1972) Teaching the Social Sciences: A Creative Direction. Sydney: McGraw-Hill.

INTERCULTURAL SOCIAL STUDIES

Buckland, J.F. (1971) Visual Recording. New Zealand: Heinemann.

Burland, C. (1965) Men Without Machines. London: Aldous Books.

Chandler, G.T. (1972) Inquiry Techniques. New Zealand: Heinemann.

Dufty, D., *et al.* (1975) Seeing it Their Way. Terry Hills, N.S.W.: Reed Education.

Durkin, M.C. (1969) The Taba Social Studies Curriculum, Grade Six — Middle and South America. California: Addison-Wesley.

Feeney, G. (1972) Inquiry About People. New York: Holt, Rinehart and Winston.

Fielder, W.R. and Feeney, G. (1972) Inquiry About Cities. New York: Holt, Rinehart and Winston.

Lewis, J.A. (1971) Current Events and Controversial Issues. New Zealand: Heinemann.

Lewis, J.A. and McNaughton, A.H. (1971) Inductive Teaching: An Introduction. New Zealand: Heinemann.

McNaughton, A.H. (1972) Evaluation. New Zealand: Heinemann.

Owen, R.C. (1972) Inquiry About Cultures. New York: Holt, Rinehart and Winston.

Samuels, E.W., Ellis, K., Durkin, M.C. (1972) People in Communities. California: Addison-Wesley.

Sandberg, J.H. (1969) Introduction to the Behavioral Sciences: An Inquiry Approach. New York: Holt, Rinehart and Winston.

Shaw, A.E. (1972) Organisation in Classroom and School. New Zealand: Heinemann.

Shindelus, M.J. and Durkin, M.C. (1972) People in Families. California: Addison-Wesley.

Synge, R. (1975) Nigeria. London: MacDonald Educational.

Tabachnick, B.R. (1972) Inquiry About Communities. New York: Holt, Rinehart and Winston.

AUDIOVISUAL EDUCATION

Goudket, M. (1973) An Audiovisual Primer. New York: Teachers College Press, Columbia University.

Jarman, C. (1972) Display and Presentation in Schools. London: A. and C. Black.

Minor, E. and Frye, H.R. (1970) Techniques for Producing Visual Instructional Media. McGraw-Hill.

Möller, H. (1970) Media for Discovery. Sydney: Angus and Robertson.

Tindell, K., Collins, B., and Reid, D. (1973) The Electric Classroom. Sydney: McGraw-Hill.

Wittich, W.A. and Schuller, C.F. (1973) Instructional Technology, Its Nature and Use. New York: Harper and Row.

Wright, A. (1970) Designing for Visual Aids. London: Studio Vista.

ROLE PLAY AND SIMULATION GAMES

Educational Materials Centre, University of Papua and New Guinea: 'Numba Wan Man — A Game'.

McGee, C.F. (1974) Role playing in the classroom. Social Studies Observer, 7 (2), p.69-82.

Shaftel, F.R. and Shaftel, G. (1967) Role-Playing for Social Values. Englewood Cliffs, N.J.: Prentice-Hall.

Social Studies Observer, 8 (1) (1974) Discovering values through problem solving. p.44-48.

OTHER MATERIALS

Department of Education, New Zealand. Open Ended Stories Series. Sound Filmstrip No. 72/206-10.

Lifeline materials from the Schools Council Project in Moral Education. Longman.

Fraenkel, J.R. (1969) A curriculum model for the social studies. Social Education, 33, 41-47.

TEACHER QUESTIONS IN SOCIAL STUDIES

Here is a system of teacher questions which covers a wide range of children's thinking.

First, there are in this system, two general categories of questions:

1. NARROW questions.
2. BROAD questions.

Within each of these two categories, there are two further kinds of questions. The notes that follow will outline these and give examples from the introductory TV material on Tonga used recently.

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NARROW QUESTIONS

These are generally questions that require low-level thinking in children because they are usually seeking short factual answers or predictable answers such as "yes" or "no".

When the teacher asks them he usually has a particular answer in mind.

Examples are:

1. What is the largest island in Tonga?
2. How many people live in Tonga?
3. Why is Tonga's climate called tropical?

As you can see, the answers to these questions can be predicted. But this does not mean that they should be avoided. Narrow questions are very necessary for:

collecting information
reviewing previous lesson material, and so on,

but their danger lies in over use. They call for mainly recall thinking. They should therefore be seen as a platform for higher level thinking.

BROAD QUESTIONS

These questions permit (or call for) a number of acceptable answers from children. Therefore, broad questions are not as predictable as narrow questions. These questions are thought provoking. They call for children to engage in thinking skills such as hypothesising, predicting, and inferring, and call for children to give opinions, judgements and feelings. These questions are designed therefore to get children to make a far deeper and broader exploration of the subject matter than do narrow questions.

Some examples:

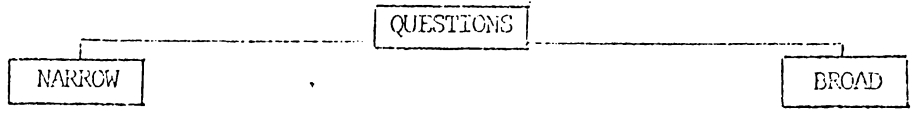
1. If young Tongan men come to New Zealand, how might this affect the rest of the village from where they came?

2. What evidence did you see concerning the hygiene of the Tongan villagers?

3. Are there problems that the Tongan villagers have in their lives?

You can see that each of these questions requires a higher degree of thinking, and that each calls for a range of acceptable answers.

Summarising so far:



NARROW QUESTIONS

1. MEMORY-RECALL QUESTIONS

Memory-recall questions are narrow questions that are limited to the lowest level of thinking. They call for the reproduction of facts, definitions, and other remembered information.

Examples:

1. How far is Tonga from New Zealand?
2. How many islands are there in Tonga?
3. Name the different kinds of food you saw in the Tongan village?

For these questions, the teacher would obviously require very narrow answers.

Now classify these as either memory-recall or "other".

1. How do the Tongan villagers get their coconuts?
2. What is the name of the village we saw in the film?
3. How much rainfall do you think occurs in Tonga?
4. What language do the Tongans speak?
5. What did you notice about the Tongan gardens?

2. CONVERGENT QUESTIONS

Although convergent questions are generally narrow, they may be broader than memory-recall questions because they may require the child to put facts together and construct an answer. They are narrow because there is usually a "best" answer or a narrow range of "right" answers.

When a child answers a convergent question, he must know certain facts, be able to associate or relate these facts, and be able to give an explanation. So these operations are important:

explaining
stating relationships
associating and relating
comparing and contrasting.

Some examples are:

1. How do the Tongan villagers prepare their food for cooking?
2. How is the method of cooking Tongan food different from ours?
3. Why do the Tongan villagers wear light clothing?

Most school text books lean heavily upon this kind of question. Asking children "why" and "how" questions seems very sound, but there is a danger that with constant use of these kinds of questions, children are taught to think in a way that they are always directed towards finding the "right" answer. In social studies however, there may not always be a "right" answer. These questions limit the scope for children to form and test their own ideas.

Classify these into memory-recall, convergent, or "other".

1. What are three vegetables the Tongan villagers get from their gardens?
2. What showed that the villagers cooperate?
3. How can you tell that it rains a lot in Tonga?
4. Do you think the villagers work hard?
5. What are three items you saw which show that the villagers use metal?
6. What do you think the villagers feelings were while they were collecting the food?
7. Why do the boys, and not the men, climb the trees?

BROAD QUESTIONS

1. DIVERGENT QUESTIONS

Divergent questions are broader than the preceding two kinds. They give the answerer the opportunity to offer a number of acceptable answers. Divergent questions are thought-provoking, and encourage the answerer to organise parts of knowledge into new patterns that he (or perhaps the class or even the teacher) was not aware of beforehand. Therefore divergent questions call for originality.

Sometimes divergent questions create new problem situations and the answerer has to synthesise ideas and construct solutions - using originality, and flexibility of ideas. Prediction, inference and hypothesising are important processes in divergent questions.

Examples are:

1. How might the villagers' lives change if the climate of Tonga became much colder?
2. If you went to Tonga, how would you communicate with the people?
3. What do you think would happen if oil was discovered in Tonga?

You can see that these questions give the children a chance to be more creative and imaginative. The children are challenged to be exploratory in their thinking, to try out ideas, to experiment. Perhaps this kind of question is neglected in our desire to "get material across".

2. EVALUATIVE QUESTIONS

The evaluative question is particularly appropriate to social studies and the social sciences generally; but it is also probably the hardest kind to use well. The evaluative question asks the child to use difficult skills such as judging, making value judgements, justifying a choice, or defending a position or argument. It involves the use of cognitive operations from all three of the other levels. It is difficult to answer too, for it requires the use of evidence. Also, these questions are not always easy to classify.

Some examples:

1. Why do you say it would be better for the villagers if they made changes in their diet?
2. What are your reasons for liking the Tongan way of life?
3. What do you think about Mary's argument?

Questions like the above can often be identified by phrases like:

How do you feel about.....?
Do you agree.....?
In your opinion....?
What do you think about.....?

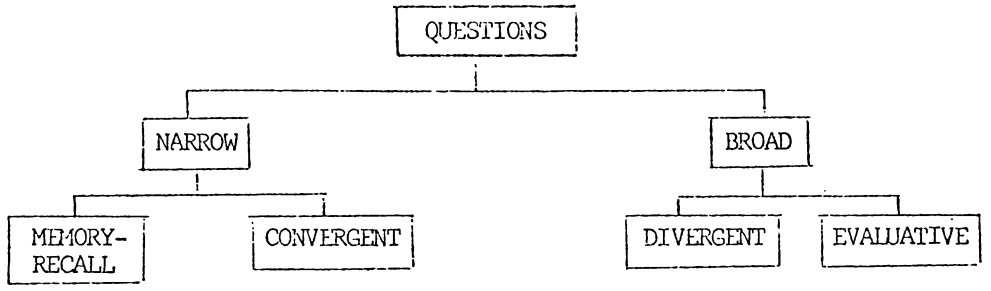
Note: Where criteria are clearly established - that is, the children have the guide or factors necessary to make a supported answer - the question is probably convergent. But this depends upon the context of the question. "Why" questions are often tricky in this way.

Some practice examples: classify according to M-R, C, D, or E.

1. Is Tonga a wealthy nation?
2. What would be the best way for Tonga to increase its industry?
3. Is agriculture important in Tonga?
4. Why is agriculture important in Tonga?
5. In your opinion, how could Tonga's agriculture improve?
6. What do you suppose would happen if a disease which destroys coconut trees hit Tonga?
7. What is the largest town in Tonga?

8. Can you imagine what it would be like if the Tongan villagers had motor cars?
9. Do you agree that the villagers are lazy?
10. Describe the houses built by the villagers.

What we have done so far can be summarised:



Now try these examples:

Classify these examples into M-R, C, D, or E (from a wider field of social studies topics).

1. Where is the city of Tokyo?
2. How many miles from New Zealand is Sydney?
3. What are the three main products of Chile?
4. Who is the King of Jordan?
5. What is there about the location of New York that makes it important?
6. How does New Zealand trade with Peru?
7. Why are Tokyo's leaders worried about the city's air?
8. How is the Siberian winter different from Hamilton's?
9. If London was near the equator, how might the people of that city live differently?
10. If you were given the job of training the tribesmen to work in factories, how might you do this?
11. What would happen if the fish in New Zealand waters were fished out?
12. If New Zealand runs out of new power sources, what might be used instead?
13. Why would you or wouldn't you like to live in Los Angeles?
14. What is your opinion about the new traffic regulation?
15. How do you feel about our present immigration policy?
16. Which Asian countries, do you think, are in most need of aid?

There is a further category of questions which we shall call routine.

ROUTINE QUESTIONS

These questions relate to classroom routines and procedures such as:

1. Management:

   (a) Does anyone have a question?
   (b) Who would like to put this chart up?

2. Structuring:

   (a) Can anyone else add to that?

APPENDIX C

LESSON MATERIALS FOR TEACHERS

The following materials were issued to the teachers who took part in the research project.

C.1 Recorded lesson on Tonga.

C.2 Tonga lesson materials.

C.3 Hopi lesson materials.

C.4 Temiar lesson materials.

RECORDED LESSON ON TONGA

Thank you for agreeing to participate in this project. This first lesson is about a small Tongan village. I am sure the children will enjoy this brief study, and I hope you do too.

You will find the following notes attached :

1. Broad concepts.
2. Lesson objectives.
3. Teacher reference notes :"Tonga, or the Friendly Islands".
4. Teacher reference notes : from Encyclopaedia Britannica.

In addition to these materials, I have prepared a 14 minute T.V. introduction to the Tongan village; and all of these materials together make what I hope is a complete package suitable for a single lesson.

AIM

1. I would like you to
   a) View the film, and
   b) read the written materials.
2. Then I would like you to prepare a 20-minute whole-class discussion with your class. I will tape record this discussion. This means that the whole lesson can be done within one timetable period:
   a) about 5 minutes to settle and get used to the T.V. material and microphones.
   b) About 14 minutes to view the T.V. film.
   c) A discussion of at least 20 minutes but no more than 25. (TOTAL: about 40-45 minutes)

3. My main idea in recording the lesson is to find out how different teachers handle a discussion using these T.V. materials. So I am not looking for any "best way" for there is probably no such thing anyway.

So, I would ask you to prepare your lesson independently of anyone else and to teach the lesson in your usual way.

PROCEDURE:

1. I will set up three microphones in the room, hanging from the ceiling, the day before the lesson.
2. On the day of the lesson I will set up the T.V. set at the front of the room, and a tape recorder at the back (where I will sit during the lesson).
3. We will seat the children on their chairs in a semi-circle around the T.V. set in 2 or 3 rows, both for viewing and discussing - because its important to be close to the microphones and also to reduce furniture or other noises (feet) as much as possible.
4. The day after the lesson either myself or a research assistant will give the children a 40 minute test on the content of the film. This will be made up of multiple choice questions and some free response questions.

NOTE: 1. It is very important that you tell the class

the day before that they will be having a person come in with T.V. and that they will see a film about Tonga and will be talking about it in a class discussion. BUT PLEASE SAY NOTHING MORE ABOUT TONGA AFTER THAT.

2. After the lesson please tell the children that person will come again the next day to give a test on what the children learnt about Tonga. Don't give any advice except for them not to worry about the tests.

TONGA LESSON

A. LESSON OBJECTIVES

As a result of viewing an introductory T.V. film about Tonga and a Tongan village, and discussing this in a class discussion of 20-25 minutes, pupils will :

1. Know the names of places; size of population; type of climate, housing, vegetation etc; physical size and location; level of technology; role functions of different persons and groups; processes of food collection, preparation and consumption; and so on.
2. Display an understanding of the concepts of co-operation, responsibility and contribution and other aspects relating to the broad understandings (other sheet).
3. Be able to make comparisons between aspects of life in the Tonga village and their own situation.
4. Be able to make evaluative statements and value judgements about topics discussed.
5. Put forward their own ideas relating to the content studied.
6. Utilize elementary map skills and spatial relationships.

1. Cultural Change:

Cultures never remain static, although the context of change (economic, political, social, technological), the speed of change, and the importance of change, vary greatly.

2. Cultural Differences:

The physical, cultural and biological worlds show extreme variation.

3. Institutions:

a) Societies develop complexes of norms and roles which guide their people towards the satisfaction of needs, and these norms and roles define behaviour.

b) The family is a social institution which performs an important function in socializing individuals.

4. Interdependence:

a) All persons and groups of persons depend on others.

b) People have to co-operate to solve their problems.

5. Values:

a) Societies and individuals often differ in the values they hold.

6. Tradition:

a) Societies tend to retain many traditional values, attitudes, and ways of living even when some of them no longer seem appropriate.

b) The family as an institution usually changes less than some other elements of societies.

C. TEACHER REFERENCE NOTES.

1. Schools Bulletin : Viliami of the Friendly Islands (New Zealand Department of Education), 1965.

2. Notes on Tonga summarised (by investigator) from Encyclopaedia Britannica

HOPI LESSON

A. LESSON OBJECTIVES

As a result of viewing an introductory T.V. film about Hopi Indians and a Hopi Indian village, and discussing this in a class discussion of 20 to 25 minutes, pupils will :

1. Know the names of places; size of population; type of climate, housing, vegetation etc; physical size and location of the reservation; role functions of different persons and groups; level of technology; nature of jobs carried out; economic aspects and trade; interaction with environment; and so on.
2. Display an understanding of the concepts of co-operation and other aspects relating to the broad understandings (reverse side).
3. Be able to make comparisons between aspects of life in the Hopi village and their own situation.
4. Be able to make evaluative statements and value judgements about topics discussed.
5. Put forward their own ideas relating to the content studied.
6. Utilize elementary map skills and spatial relationships.

B. BROAD CONCEPTS

(As for Tonga lesson)

C. TEACHER REFERENCE NOTES

1. Summarised notes from Burland, G. (1965) Man Without Machines. London: Aldus.
2. Summarised notes from Encyclopaedia Brittanica.

TEMIAR LESSON

A. OBJECTIVES

As a result of viewing an introductory T.V. film about the Temiar people and discussing this in a class discussion of 20 to 25 minutes, pupils will :

1. Know the names of places; type of climate and physical environment; physical features of the people; location of the Temiar; role functions of different persons and groups; trade and economic aspects; level of technology; nature of jobs carried out; house construction; interaction with environment; agriculture and hunting; clothing; and so on.
2. Display an understanding ofthe concepts of co-operation responsibility and contribution and other aspects relating to the broad understandings (on separate sheet).
3. Be able to make comparisons between aspects of life in the Temiar settlement and their own situation.
4. Be able to make evaluative statements and value judgements about topics discussed.
5. Put forward their own ideas about the content studied.
6. Utilize elementary map skills and spatial relationships.

B. BROAD CONCEPTS:

(as for Tongan lesson)

C. TEACHER REFERENCE NOTES

Notes were compiled by the investigator from the following text : Slimming, J. (1958) Temiar Jungle : A Malayan Journey. London : John Murray.

APPENDIX D

RECORDING AND TELEVISION EQUIPMENT (CLASSROOM)

The following equipment was used for taperecording the lessons in classrooms:

1. National Panasonic taperecorder.
2. Sony 6-channel stereo microphone mixer.
3. Hanimex Dynamic headphones, Model HH01M.
4. Sony Electret condenser microphones.

The following television equipment was used to show pupils prepared audio-visual lesson sequences:

1. Sony U-matic Videocassette Recorder.
2. Sony Trinitron Colour Video Monitor.
3. Sony KcA 60 videocassette.

APPENDIX E

ACHIEVEMENT TESTS

E.1 Tonga Test.

E.2 Hopi Test.

E.3 Temiar Test.

E.4 Answer Sheet.

NOTES:

(a) Each multiple-choice item has been classified in the following way:

CM = Cognitive memory level.

HO = Higher-order level.

(b) Free response items were not listed in the test paper given to the pupils. They were displayed on cards in the classroom. They are listed at the end of each test for information only.

(c) Each free response item was timed as follows:

Evaluative thinking = 2½ minutes.

Divergent thinking = 4 minutes.

TONGA TEST

DIRECTION

Questions 1 - 24 are to see what you learnt from your lesson on Tonga.

You are to choose the ONE answer you think is best.

EXAMPLE

1. The village in the film is called

   A) Kao

   B) Rata

   C) Hoi

   D) Tua

The best answer is "Hoi". You will see that "Hoi" has the letter C in front of it. You put a C in the space on the answer sheet :

1. C

DO NOT TURN OVER UNTIL YOU ARE TOLD

1. Which sea or ocean are the Tongan Islands in ?

* A) Pacific

B) Atlantic

C) Tasman

D) Indian (CM)

2. The people of Tonga belong to the cultural group of people known as

A) Melanesians

B) Asians

* C) Polynesians

D) Micronesians (CM)

3. In Tonga there are about as many people as there are in

A) Cambridge

B) Auckland

* C) Hamilton

D) Wellington (CM)

4. In the fields the people were digging

A) Carrots

B) Potatoes

C) Taro

* D) Kumaras (CM)

5. Who got the oven ready ?

A) Women

B) Boys

C) Girls

* D) Men (CM)

6. How far is Tonga from New Zealand ?

A) 600 kilometres

* B) 1,600 kilometres

C) 2,600 kilometres

D) 3,600 kilometres (CM)

7. Who looked after the young children ?

A) Older boys

B) Older women

C) Older men

* D) Older girls (CM)

8. How many islands are there in Tonga ?

A) 50

* B) 150

C) 250

D) 350 (CM)

9. How many families live in Hoi village ?

A) 44

B) 34

* C) 24

D) 14 (CM)

10. What were the men waiting for while they sat on the grass and smoked cigarettes?

* A) The food to cook in the ground oven.

B) The women to return from the gardens.

C) The food to be brought to them.

D) The children to finish playing a game. (HO)

11. In the Tongan village fish are caught by

* A) Spearing the fish with sticks.

B) Using lines from a boat.

C) Using rods with bait.

D) Putting out lines from the reef. (HO)

12. Which of these things best tells that Tonga is near the Equator ?

A) Tonga has only a few mountains.

B) There are thick forests in Tonga.

* C) Most days in Tonga are warm.

D) Tonga has a small population. (HO)

13. Which of these occupations is carried out in New Zealand but not in the Tongan village ?

A) Raising animals for food.

* B) Working in a factory.

C) Preparing food for eating.

D) Growing food crops. (HO)

14. Which of these words best describes the climite of Tonga ?

* A) Tropical

B) Temperate

C) Variable

D) Continental (HO)

15. Which direction from New Zealand is Tonga ?

A) West

B) South

* C) North

D) East (HO)

16. What sentence best tells us what the film on Tonga was about :

* A) People were getting and cooking food.

B) People were showing how much food they had.

C) People were having a celebration.

D) People had visitors for the evening meal. (HO)

17. When collecting food each person had

A) A lot of different jobs.

B) Some orders to carry out from the leader.

* C) A job for which he was responsible.

D) To take part in a discussion to organise the jobs. (HO)

18. How do you think most of the villagers looked during the film ?

A) Thoughtful

* B) Contented

C) Excited

D) Worried (HO)

19. Some of the old ways of the village people in Tonga are changing and new ideas are being used. Which activity shows this ?

A) Using wood to build houses.

B) Carrying food in woven baskets.

C) Keeping food away from dirt by using leaves.

* D) Using metal knives to cut vegetables. (HO)

20. Which of these sentences best shows how the people in the village co-operate ?

A) When a village cricket team is playing, a lot of the people go to watch.

B) In the mornings every person goes to the water tank to wash.

C) Mrs. Navua goes to the market every week to buy food.

* D) When Mr. Tama builds a new house, his brothers help him put on the roof. (HO)

21. Why do boys have to climb the coconut trees to get down the coconuts ?

A) The boys climb the trees to avoid doing other jobs.

* B) Boys are lighter than men and climb more easily.

C) The men are too old for climbing trees.

D) The men might break the thin trees. (HO)

22. How can you tell that it rains a lot in Tonga?

A) There is a lot of water to fish in.

B) There are very few animals kept.

C) The people dig the soil for crops.

* D) The plants grow plentifully. (HO)

23. Which of these parts of Tongan village life shows that the villagers have made contact with Europeans ?

* A) The kind of clothing worn.

B) The way they lived peacefully.

C) Their ideas about food.

D) The kinds of houses they had. (HO)

24. What is one advantage of having a system of co-operation in Tongan families ?

A) The leader knows he will be obeyed when he gives orders.

B) Everyone has a chance to take a day off now and then.

* C) The members don't feel they are in competition with each other.

D) The gardens are cultivated more regularly by everyone. (HO)

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD

For numbers 25, 26 and 27, the person giving you the test will give you a statement about the Tongan village. You then decide whether you AGREE or DISAGREE with it.

On your answer sheet put a tick in the box beside AGREE if you AGREE, or in the box inside DISAGREE if you DISAGREE.

Then write down as many REASONS that you can think of from the film and the discussion you had with your teacher why you agree or disagree.

Do not worry about spelling, but write clearly with a pen.

Work as fast as you can to get down as many reasons as possible.

Questions 28, 29 and 30 are questions that get you to use your own ideas.
Try to get unusual ideas, but ideas that could work.
There are no right and wrong answers.
Do not worry about spelling. Write clearly
Work as fast as you can to get down as many ideas that you can think of.

FREE RESPONSE ITEMS (TONGA TEST)

Evaluative Thinking Sub-test

25. The villagers are not very healthy.

26. The villagers were lazy.

27. The Tongan village would be a good place to go to live for a few years.

Divergent Thinking Sub-test

28. Just suppose the Tongan village moved close to the South Pole.
How might this change the lives of the Tongan villagers ?

29. Just suppose you went to the Tongan village for a holiday, and you wanted to communicate with them. How might you get the village people to understand you ?

30. Just suppose electricity was put into the village in the film. How might this change the lives of the Tongan villagers ?

NOTE:
For each Evaluative thinking item, pupils were given exactly two and one half minutes to make responses, and for each Divergent thinking, the time given was exactly four minutes.

HOPI TEST

DIRECTIONS

Questions 1-24 are to see what you learnt from the television about Hopi Indians.

You are to choose the ONE answer you think is best.

EXAMPLE:

1. In the film, who looked after the baby?

A) Grandmother

B) Older sister

C) Grandfather

D) Mother.

The best answer is "older sister". You will see that "Older sister" has the letter B in front of it. If this was the first question you would write B in the brackets beside No. 1.

DO NOT TURN OVER UNTIL YOU ARE TOLD.

1. What State is the Hopi village located in ?

A) Texas

* B) Arizona

C) New Mexico

D) Utah (CM)

2. What did the Hopis in the film do with the wool from their sheep ?

A) Weave it into clothes for themselves.

B) Make clothes to sell to tourists.

C) Trade it for food with other Indians.

* D) Sell it to the trading store. (CM)

3. What are kachina dolls supposed to teach Hopi Children ?

A) How to become good parents.

* B) How to lead good lives.

C) How to become good warriors.

D) How to learn tribal songs. (CM)

4. What fruit was being put out to dry by the grandmother ?

A) Apricots

B) Apples

C) Pears

D) Nectarines

* E) Peaches (CM)

5. Who made contact with the Hopis about 400 years ago ?

* A) Spanish

B) English

C) Americans

D) French (CM)

6. How far is the Hopi Reservation from New Zealand?

A) About 13,000 kilometres

* B) About 10,000 kilometres

C) About 7,000 kilometres

D) About 4,000 kilometres (CM)

7. The winter temperatures at the Hopi reservation are

A) Warm

B) Moderate

* C) Cold

D) Cool (CM)

8. Which of these crops is grown a lot by Hopis ?

* A) Squash

B) Cucumber

C) Yams

D) Turnips

E) Potatoes (CM)

9. "Pueblo" means an Indian

A) House

B) Garden

C) Meeting-place

* D) Settlement (CM)

10. The Hopis grind flour by hand, but in New Zealand machines grind flour. This shows that

A) New Zealand people do not like flour which is ground by hand.

B) Hopis know how to co-operate better than New Zealanders.

* C) New Zealand has a higher level of technology.

D) Hopis should buy machines to make better flour. (HO)

11. Which of these things best tells us that Hopis live in desert country ?

A) There are only a few hills.

B) Many days have no clouds in the sky.

* C) There is little rainfall each year.

D) The soil is very rocky. (HO)

12. What is the most important advantage of the trading store for the Hopis ?

A) Hopis can meet friends there to talk about things.

B) Hopis can learn what tourists would like to buy.

* C) Hopis can sell what they make for things they want.

D) Hopis can buy more tinned food to eat instead of corn. (HO)

13. Which of these things would Hopi children learn most about at school ?

* A) How other people in the world live.

B) To be like all other Americans.

C) To respect their elders.

D) To take greater responsibility at home. (HO)

14. How did the people in the film know which job to do each day.

* A) They knew they were responsible for the same jobs every day.

B) They chose what jobs they wanted to do each day.

C) Each person was told what to do by the grandmother.

D) Leaders shared out jobs so everyone did different jobs each day. (HO)

15. What best tells us that Hopis understand about conservation ?

* A) Food is stored for more than one season.

B) The school teaches about conservation.

C) They know how to get water from cactus.

D) Pottery clay is collected from below the mesa. (HO)

16. Why do you think Hopis collect dead wood instead of cutting down trees for firewood ?

A) Dead wood is plentiful on the ground.

B) There are no trees to cut down.

C) They think dead wood burns better than trees.

* D) They want to preserve the few trees there are. (HO)

17. Here are some statements about the climate. Which one best describes the climate where the Hopi live ?

* A) Summers are hot and winters cold.

B) Hurricanes are common in the windy season.

C) Summer temperatures are cool and winters cold.

D) Rainfall is low in summer and high in winter. (HO)

18. What sentence tells us best what the film of the Hopis was about ?

A) Hopis were collecting food as they usually did.

* B) Hopis were going about their daily lives.

C) Hopis were protecting their way of life from change by outsiders.

D) Hopis were showing they had few problems in their lives. (HO)

19. In the film, what do you think Hopi children thought about the old people ?

A) The children got impatient with the older people.

B) The children were afraid of the older people.

* C) The children showed respect for the older people.

D) The children showed little respect for the older people. (HO)

20. Which of these things shows that New Zealand has a more advanced level of technology than Hopi Indians ?

A) Most Hopi children go to school these days.

* B) Most New Zealand families own a motor car.

C) Hopis are doing more trade with other Americans.

D) New Zealand and Hopi people believe different things about religion. (HO)

21. Which of these things best show that Hopis have learnt to adapt to their own surroundings ?

A) The trading store brings them goods from other parts of America.

B) Like other American Indians, Hopis can make clay pots.

* C) Hopi paint brushes are made from small desert plants.

D) Hopis believe their dolls stand for good and evil spirits. (HO)

22. Which of these sentences best shows that Hopi children have to take responsibility ?

* A) Hopi boys collect firewood and look after gardens.

B) Children go to school only in autumn and winter.

C) Hopi girls learn to play families with corn husk dolls.

D) Hopi boys learn skills with spinning tops.

(HO)

23. Which of these things best shows how the Hopis in the village co-operate ?

A) The grandmother goes to the trading store each week to buy and sell goods.

B) In autumn and winter the children go to the school a mile from the village.

* C) The fathers and older cousins mind the sheep while women do jobs in the village.

D) Young children have to listen carefully when old men tell them about the spirits. (HO)

24. Which of these parts of Hopi life shows that Hopis have had contact with other cultures ?

A) Houses are built out of sun-dried bricks.

B) Spirits are important in the lives of Hopis.

* C) Words have been added to the Hopi language.

D) Hopis make masks for special days. (HO)

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Then write down as many REASONS that you can think of from the film and the discussion you had with your teacher why you agree or disagree.

Do not worry about spelling, but write clearly with a pen.

Work as fast as you can to get down as many reasons as possible.

Questions 28, 29, and 30 are questions that get you to use your own ideas and imagination.

Try to get unusual or clever ideas, but ideas that could work.

There are no right and wrong answers.

Do not worry about spelling. Write clearly.

Work as fast as you can go get down as many ideas that you can think of.

FREE RESPONSE ITEMS (HOPI TEST)

Evaluative Thinking Sub-test

25. Hopis should move to somewhere better to live.

26. Hopis live a lonely life.

27. Hopis have few problems to face in their lives.

Divergent thinking sub-test

28. Just suppose the Hopi village got as much rain as we do. How might this change the lives of the Hopi people ?

29. Just suppose a major motorway was built half a mile from the village we saw in the film. How might this change the lives of the Hopi people ?

30. Just suppose there was no trading store near the Hopi village. How might this change the lives of the Hopi people ?

E.3

TEMIAR TEST

DIRECTIONS

Questions 1-24 are to see what you learnt from the television about Temiar people. You are to choose the ONE answer you think is best .

EXAMPLE:

1. In what did the Temiar people cook their food ?

A. Metal pots

B. Ground ovens.

C. Green leaves

D. Bamboo stalks.

The best answer is "bamboo stalks". You will see that "bamboo stalks" has the letter D in front of it. If this was the first question you would write D in the brackets beside No. 1.

DO NOT TURN OVER UNTIL YOU ARE TOLD.

- 1 -

1. How many people could live in the longhouse in the film ?

A) 40 to 60

* B) 80 to 100

C) 120 to 140

D) 160 to 180 (CM)

2. Which crop is grown a lot by the Temiar people ?

A) Yam

* B) Tapioca

C) Kumara

D) Taro

E) Pumpkin (CM)

3. What were the Temiar people planting in the gardens ?

* A) Maize

B) Potatoes

C) Yams

D) Carrots

E) Taro (CM)

4. What is an "extended family" ?

A) All the children of two grandparents.

* B) A group of many relations living together.

C) A tribe living in the same village.

D) A family that has no old people in it. (CM)

5. What did the men do before they cut down the trees ?

A) Sharpened the blunt knife blades.

B) Got the women to stand well back.

C) Cleared a place for the longhouse.

* D) Put handles onto the axes heads. (CM)

6. When gardening, who made the holes for the seeds?

A) Children

B) Younger women

C) Older women

* D) Young men

E) Older men (CM)

7. Who put the roof onto the longhouse ?

* A) Young men

B) Older men

C) Boys and men

D) The headman (CM)

8. What does "anang" mean ?

A) Garden

B) Tribes

C) Longhouse

* D) Leader (CM)

9. Which of these animals do the Temiar people hunt for food ?

* A) Monkeys

B) Elephants

C) Buffalo

D) Tigers (CM)

10. Which of these things best shows that Temiar children have to take responsibility ?

* A) Children cut down trees for the longhouse.

B) Children do not go to primary school.

C) Children are afraid of spirits in the jungle.

D) Children learn the dances of the tribe. (HO)

11. Which of these statements best describes the climate where the Temiar people live ?

A) Summers are hot and winters cool.

B) Most rain falls in the winter.

* C) There is little difference between the seasons.

D) Hurricanes are common in the windy season. (HO)

12. Why do the Temiar people build their longhouses high off the ground ?

A) To stop water leaking in from the ground.

B) To keep away evil spirits lurking in the ground.

* C) To protect them from wild animals at night.

D) To make a springy floor for dancing. (HO)

13. Which of these things best tells that the Temiar people live near the Equator ?

A) There are thick forests.

B) There are high mountains.

C) Rainfall is very heavy.

* D) Most days are hot. (HO)

14. What do the Temiar people do with the baskets they make ?

A) Trade them with a nearby village.

B) Use them all themselves for food carrying.

C) Take them to a town to trade them.

* D) Use some themselves and trade the rest (HO)

15. How can you tell that it rains a lot where the Temiar people live ?

A) The people catch fish to eat.

B) The village is in the mountains.

C) The soil is dug for crops.

* D) The plants grow very quickly. (HO)

16. From what you saw in the film, which of these things do the Temiar people do ?

* A) Smoke cigarettes.

B) Carve wood.

C) Play cards.

D) Drink coffee. (HO)

17. Which of these things <u>best</u> shows that Temiar people have learnt how to use their own surroundings ?

A) The Temiar believe spirits live in the mountains.

B) The Temiar women wear cotton dresses.

* C) Blowpipe darts have tips of poison from plants.

D) Few people ever visit the Temiar village. (HO)

18. Which of these things show that New Zealand has better technology than the Temiar people ?

A) Temiar children do not have toy machines.

* B) Temiar people dig their gardens with sticks.

C) Temiar people trade with other Malaysians.

D) Temiar people use axes to cut trees. (HO)

19. In the film, why were the people eating only tapioca while they built the longhouse ?

A) The men could not catch any animals in the traps they had set.

* B) They wanted to finish the longhouse before they got other food.

C) The crops in the gardens did not have any food left in them.

D) It was the season when there is little food for them to get. (HO)

20. Which of these sentences <u>best</u> shows that the longhouse people co-operate with each other ?

A) Sometimes people go by raft to the big town.

B) Older people tell the children stories of long ago.

C) The women weave mats for the longhouse.

* D) When seeds are planted everyone has a job. (HO)

21. Why does the longhouse have inside walls ?

A) To keep down the winds.

B) So each person has a private room.

C) The longhouse is easier to keep dry.

* D) To make rooms for each family. (HO)

22. What is one problem the Temiar people have when growing crops ?

A) It is hard to tell the best time for planting.

B) The temperatures are too hot for plants.

* C) Weeds grow quickly and choke the young plants.

D) There is too much rain for the growing plants. (HO)

23. Which of these things shows that the Temiar people have mixed with people outside their jungle ?

A) Temiar people live a peaceful life.

B) Their longhouses are made with bamboo.

* C) Temiar women wear bright cotton clothes.

D) Traps are used to catch animals. (HO)

24. Why do the Temiar people think it is good for them to co-operate with each other ?

A) Everyone can take a day off work now and then.

* B) There is no need for people to compete against each other.

C) The headman gives all the orders and everyone obeys him.

D) Everyone takes a turn at digging the garden. (HO)

DO NOT TURN OVER UNTIL YOU ARE TOLD.

For numbers 25, 26 and 27, the person giving you the test will give you a statement about the Temiar village. You then decide whether you AGREE or DISAGREE with it.

On your answer sheet put a tick in the box beside AGREE if you AGREE, or in the box beside DISAGREE if you DISAGREE.

Then write down as many REASONS that you can think of from the film and the discussion you had with your teacher why you agree or disagree.

Do not worry about spelling, but write clearly with a pen.

Work as fast as you can to get down as many reasons as possible.

Questions 28, 29 and 30 are questions that get you to use your own ideas and imagination.
Try to get unusual or clever ideas, but ideas that could work.
There are no right or wrong answers.
Do not worry about spelling. Write clearly.
Work as fast as you can go. Get down as many ideas that you can think of.

FREE RESPONSE ITEMS (TEMIAR TEST)

Evaluative thinking sub-test

25. Because of the place they live, the Temiar people are not very healthy.

26. The government should make the Temiar children go to school.

27. The Temiar people would be better off if they moved to live in a town.

Divergent thinking sub-test

28. Just suppose all the bamboo growing where the Temiar people live got a disease and died. How might this change the lives of the Temiar people?

29. Just suppose a shopkeeper from a town set up a trading store in the village. How might this change the lives of the Temiar people ?

30. Just suppose oil was discovered where the Temiar people live. How might this change the lives of the Temiar people ?

NAME:..... AGE: Yrs. ..... Mths. .....

SCHOOL: .....

DATE: ..... ROOM NO. .....

1.	( )	9.	( )	17.	( )
2.	( )	10.	( )	18.	( )
3.	( )	11.	( )	19.	( )
4.	( )	12.	( )	20.	( )
5.	( )	13.	( )	21.	( )
6.	( )	14.	( )	22.	( )
7.	( )	15.	( )	23.	( )
8.	( )	16.	( )	24.	( )

25. ☐ Agree ☐ Disagree

Reasons:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

26. ☐ Agree ☐ Disagree

Reasons:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

26. (cont'd)

10. _____

27. ☐ Agree ☐ Disagree

Reasons:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

28. Ideas

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

29. Ideas

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

---

30. Ideas

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

APPENDIX F

TEACHER ATTITUDE INVENTORY (Zevin)

DIRECTIONS

This inventory consists of 25 statements designed to sample opinions about teaching. There is considerable disagreement about these aspects; therefore there are no right or wrong answers. What is wanted is your own individual feeling about each statement. Read each statement and decide what YOU feel about it. The mark your response on the space provided on the response sheet.

	SA	A	U	D	SD
If you strongly agree, cross the dot under SA	x	.	.	.	.
If you agree, cross the dot under A	.	x	.	.	.
If you are undecided or uncertain, cross the dot under U	.	.	x	.	.
If you disagree, cross the dot under D	.	.	.	x	.
If you strongly disagree, cross the dot under SD	.	.	.	.	x

Think in terms of the general situation rather than specific ones. There is no time limit, but work as rapidly as you can.

PLEASE ANSWER EVERY ITEM

1. A teacher should represent the facts to his pupils, not encourage speculation and guesswork.
2. A teacher should make pupils feel "that learning can be fun".
3. Youngsters often do a very fine job of running the class without teacher direction.
4. The teacher should allow the outcomes of a pupil discussion to stand even if they don't agree with his own ideas.
5. A pupil has the right to disagree openly with his fellow pupils.
6. The teacher should maintain control and approval over all ideas that are brought up in the classroom.
7. Teachers who are most respected by their pupils are the ones who allow the members of the class to express their thoughts freely.
8. Pupils are usually not qualified to select their own topics for study.
9. The teacher must see to it that the pupils learn the right ideas about morals and ethics.
10. Youngsters will think for themselves if permitted.
11. Children usually will not think for themselves.
12. A teacher should try to persuade pupils, but should not command acceptance.
13. It is more important that pupils understand what they learn than it is that they cover a large range of information.
14. The thinking process is really what the teacher should emphasise.
15. A youngster knows better what he has learnt by his own efforts than what has been taught to him.
16. Pupils should be discouraged from expressing personal views and opinions in class.
17. A noisy, but constructive exchange of ideas is good for a class.
18. A teacher should see to it that pupils get the right answers.
19. Pupils are not mature enough to make their own decisions.
20. Praise is almost always more effective than punishment.
21. A pupil has the right to disagree openly with his teacher.
22. Pupils should be encouraged to criticise what they read and hear even if it comes from an authority.
23. The teacher should encourage pupils to criticise and react to each other's ideas.
24. A teacher should encourage pupils to solve problems rather than give them answers.
25. Teaching can be a very stimulating and enjoyable experience.

TEACHER ATTITUDE INVENTORY

RESPONSE SHEET

	SA	A	U	D	SD
1	.	.	.	.	.
2	.	.	.	.	.
3	.	.	.	.	.
4	.	.	.	.	.
5	.	.	.	.	.
6	.	.	.	.	.
7	.	.	.	.	.
8	.	.	.	.	.
9	.	.	.	.	.
10	.	.	.	.	.
11	.	.	.	.	.
12	.	.	.	.	.
13	.	.	.	.	.
14	.	.	.	.	.
15	.	.	.	.	.
16	.	.	.	.	.
17	.	.	.	.	.
18	.	.	.	.	.
19	.	.	.	.	.
20	.	.	.	.	.
21	.	.	.	.	.
22	.	.	.	.	.
23	.	.	.	.	.
24	.	.	.	.	.
25	.	.	.	.	.

APPENDIX G

S O C I A L S T U D I E S

INFERENCE TEST

STANDARD 2 TO FORM 2

DEPARTMENT OF EDUCATION
AUCKLAND NEW ZEALAND
1974

1.

SOCIAL STUDIES INFERENCE TEST

S.2 to Form 2

Introduction

1. This test is to find out how well you can think about the important ideas in some social studies stories. To do this you are going to have some stories read to you followed by some sentences about each story. You have to decide whether each sentence about the story above it is:

either	Probably True:	That is, you think that as far as you can tell from the story the sentence is right or correct,
or, it is	Probably Not True:	That is, you think that as far as you can tell from the story the sentence is not right or correct,
or, you	Can't Tell:	That is, you think that you really can't tell from the story whether the sentence is right or not right.

If you think a sentence is Probably True, place a tick in the brackets under this heading on your answer sheet. (Look at the answer sheet to see where this is.)

If you think a sentence is Probably Not True, place a tick in the brackets under this heading on your answer sheet.

If you Can't Tell whether a sentence is probably true or probably not true place a tick in the brackets under this heading.

2. Do you see the heading Example on the next page? Now read through the first part of the Example with me. (Read) Now, read the first sentence and see if you can decide from the story we have just read whether sentence number 1 is Probably True, Probably Not True or whether you really Can't Tell if it is probably true or probably not true. See where Example is on your answer sheet. Place your tick under what you think is the right heading on your answer sheet. Remember only one tick must go under one heading. Now let's talk about what you got. Now try the second sentence.

3. If you make a mistake and put a tick in the wrong brackets, just cross it out neatly and put the tick where you think it should go.

(You may ask questions if you are not sure about anything at this point.)

Now, turn over the page to the story about Martha and begin.

Example:

Mr Jones was a shopkeeper in Wellington. When he heard about the discovery of gold in Otago he packed his bag and went to the gold fields.

1. Mr Jones did not take his family to Otago.

2. Mr Jones went to Otago because he wanted to find gold.

DO NOT MARK THIS BOOKLET

Martha left her school friends in New Zealand and moved with her family to live in England. Soon after they moved she started at her new school.

On her first day at school the other children stared at Martha and talked about her. She did not speak to the other children, and at play-time she sat alone and watched them play. She told the teacher that she was unhappy. When she got home from school she cried.

1. Martha wanted to play with the other children.

2. Martha wants to make friends at this school.

3. Martha does not speak English.

4. Martha will teach the children how to play some new games.

5. The teacher likes Martha.

DO NOT TURN OVER UNTIL YOU ARE TOLD

MR EDWARDS' FARM

Mr Edwards' farm was in the valley. He had just finished planting grass seed in some of his paddocks. He could see dark clouds gathering in the west. He hoped the rain would not be too heavy when it came. A fire last summer burned almost all of the trees and bushes on the nearby hills.

6. Mr Edwards' grass seed will rot in the wet ground.

7. Soil from the hills will be washed down into the valley.

8. Mr Edwards will have enough water for his cows this year.

9. Mr Edwards' farm is on the hill side.

DO NOT TURN OVER UNTIL YOU ARE TOLD

Mr and Mrs Claassen remembered the day their ship arrived at Wellington. They had been married only two months when they arrived from Holland. New Zealand was a strange land to them.

Mr Claassen worked hard for many years so his family could buy their own house. Tom, the oldest child, is now at university and will one day become a lawyer.

10. The Claassens spoke English well when they first came to New Zealand.

11. The Claassens came to New Zealand last year.

12. Tom is proud of his father.

13. The Claassens will return to Holland to live.

14. Mr Claassen did not find New Zealanders very friendly.

DO NOT TURN OVER UNTIL YOU ARE TOLD

Rewa

The men in Rewa's tribe had planted kumara. Soon the women would weed the ground with their wedding sticks. Everyone in the tribe would help to store the kumara when they are due.

Tom

Tom's mother bought kumara from the shop. When the shopkeeper could not buy as many kumara as he needed for his shop, Tom's mother had to pay more for them.

15. Rewa will have no kumara to eat if he does not plant some himself.

16. Women in Rewa's tribe do not plant kumara.

17. It is better to buy kumara than to bother about growing them.

18. The shopkeeper grows kumara to sell.

19. If Rewa's tribe did not have enough kumara to eat they could buy some from the shop.

20. Tom's father grows kumara for his family.

DO NOT TURN OVER UNTIL YOU ARE TOLD

Pambo

Pambo is twelve years old. There are no schools where Pambo lives. He does not read or write. He fishes with his father every day. Pambo is learning to cut wood from tree bark in order to make a canoe. His father teaches him many things and is proud of how well Pambo can do them.

Jack

Jack is also twelve years old. He works hard at school and does well. When he comes home from school he reads his books so that he will learn things that will help him with his school work.

21. Jack is smarter than Pambo.

22. Pambo's father can read and write.

23. Pambo and his family are going to move to the city where Jack lives.

24. Jack wants to learn to make a canoe like Pambo's.

DO NOT TURN OVER UNTIL YOU ARE TOLD

HENRY AND TOMA

Henry

Henry's father is a farmer. Henry is twelve years old. During the week Henry goes to school and one day he wants to become a teacher. On weekends he works on the farm and has learned to drive a tractor. His father is happy that Henry wants to become a teacher.

Toma

Toma is also twelve years old. Toma's father is a hunter. Toma's grandfather also was a hunter. Toma is learning to hunt from his father. Many times on the way home from hunting Toma stops to watch the fisherman. One day Toma asked his father, "Will I become a fisherman?" Toma's father said, "No, because I am a hunter".

25. Henry will become a teacher.

26. Henry's grandfather was a farmer.

27. Toma will leave the tribe and become a fisherman.

28. Toma's sons will become hunters.

DO NOT TURN OVER UNTIL YOU ARE TOLD

Mr Lee owns a fruit shop in town and he lives in a flat behind his shop. Often, in the last few weeks, he has not had enough apples for his customers. It has been an unusually dry season in the area and the apple trees have not done well this year.

29. Mr Lee is unable to get apples because the delivery trucks have broken down.

30. There was as much rainfall this year as last year.

31. Mr Lee will start growing his own fruit trees.

32. They are sending the apples to a canning factory this year instead of delivering them to the fruit shop.

33. The apples this year are of poor quality.

34. The price of apples is higher this year than last year.

STANDARD TWO STOP HERE

MR HARVEY'S TALK

Mr Harvey spoke to the Early Settlers Club last night. Here is part of what he said:

> "In the early days of our country many people settled here from other countries. They came here to establish a way of life that was better than they had in their own countries. They helped make New Zealand the wonderful country it is today.
>
> Now-a-days the foreigners who come here do not seem to appreciate the freedom and opportunity New Zealand offers them.
>
> We ought to be more careful about who we let in and make all foreigners promise to be loyal New Zealanders before we accept them.

35. Mr Harvey feels that people who promise to be loyal can be trusted.

36. Mr Harvey likes people from other lands who are now coming to live in New Zealand.

37. Mr Harvey thinks the early settlers were good for New Zealand.

38. Mr Harvey has studied a great deal about New Zealand.

39. Mr Harvey thinks that people born in New Zealand are more loyal than people coming from other lands.

40. Mr Harvey believes that there are not enough foreigners in New Zealand now.

41. Mr Harvey is hoping to become a member of parliament one day.

DO NOT TURN OVER UNTIL YOU ARE TOLD

MR ROACH'S LAND

Thirty years ago Mr Roach bought three hundred acres of farmland. Many new factories have now been built in the city nearby. About ten years a go Mr Roach sold half his farm to people who build homes. Last year Mr Roach sold fifty acres more and many homes have already been built on this land.

42. The people are coming to work on Mr Roach's farm.

43. Houses are being built for the people coming to work in the factories.

44. Mr Roach will sell the rest of his farmland to the people building homes.

45. Mr Roach still owns half of the farmland that he bought thirty years ago.

46. Next year there will be more people working in the factories.

47. Mr Roach sold his farmland for more money than he paid for it.

48. More schools will be needed.

49. The people who had worked on Mr Roach's farm went to work in factories.

50. The people who bought Mr Roach's farmland were farmers.

DO NOT TURN OVER UNTIL YOU ARE TOLD

Captain Sands had been in his schooner at Kasubu Island for several weeks. Trading with the island people had not gone well. The Chief and his people did not seem to want to trade any of their food or mats for the blankets, tools, whisky and muskets the white mean had brought.

To make matters worse one of the schooner's crew was attacked for touching a sacred decorated club in the chief's hut. Wherever the traders went they were followed by island people lurking in the bushes.

"Who do they think they are?" said Captain Sands to his first officer. "They're just a bunch of lazy, stupid savages like all the others we've met on this trip. Hard work, a good beating and the word of the Lord is what they need. Then they'd learn to respect us," he muttered.

---

51. The crew of the schooner thought the island people should be treated harshly.

---

52. The island people would have been better off than they were before if they had traded with the white men.

---

53. Captain Sands thought that he and his men were better than the island people.

---

54. After a few more weeks Captain Sands and the island people would become friends.

---

55. The island people did not want any white people to visit them.

DO NOT TURN OVER UNTIL YOU ARE TOLD

Daily News, Monday, 15 October

FURTHER EGG RISE MONDAY,
HOUSEWIVES PROTEST

Wellington, P.A. Thursday.

It was announced in Wellington this morning that the price of eggs will rise on Monday for the second time in three months. The large size will be 58 cents a dozen, medium 50 cents a dozen, and small 42 cents a dozen. Commenting on the price rise which was not expected at this time of the year, the Secretary of the Egg Marketing Board said in Wellington that the increase was unfortunate but necessary, because the supply of feed had been badly affected by poor grain harvests last year.

Concern at the rise was expressed by the President of the New Zealand Housewives' Association, Mrs M. Batten. "Once more the housewife has to put up with price rises," she said, "just because of the Government's short-sighted policy. It is time they did something about a suitable supply of grain. Everybody needs eggs. Doctors agree they are an important part of a balanced diet. Our husband's pockets and health of our children will suffer".

---

56. It is unusual for the price of eggs to rise during the spring.

---

57. Children's weight will be affected if they have no eggs in their diet.

---

58. A shortage of grain affected the price of eggs.

---

59. It's the poultry farmers' fault that the prices are to rise.

---

60. The Government's policy on egg prices is not a good one.

DO NOT TURN OVER UNTIL YOU ARE TOLD

TASMAN'S VISIT

Tasman wrote this in his log as his ships sailed away from Murderers' Bay, 1642

"We weighed our anchors and set sail since we were of the opinion that no friendship could be made with these people, nor water nor refreshment be obtained. Having weighed anchor and being under sail, we saw several canoes near the shore, of which eleven crowded with people were making for us. We kept quiet until the moment we could fire at some of the foremost, and then fired one or two shots, but in vain. Those of the "Zeehaen" also fired, and in the foremost canoe hit a man (who was standing with a stick in his hand) so that he fell down. We also heard a shot strike against the canoe. As soon as they received this shot, they speedily returned to the shore".

61. Tasman wanted to make friends with the Maoris.

62. Tasman was writing his log while aboard the "Zeehaen".

63. Tasman did not trust people he did not know.

64. The ships had called to get fresh food and water.

65. Tasman's men were out-numbered by the men in the canoes.

FINISH

ANSWER SHEET

NAME: _____ SCHOOL: _____

AGE: CLASS:

No.	EXAMPLE Probably True	Can't Tell	Probably Not True
1.	( )	( )	( )
2.	( )	( )	( )

No.	START HERE Probably True	Can't Tell	Probably Not True
1.	( )	( )	( )
2.	( )	( )	( )
3.	( )	( )	( )
4.	( )	( )	( )
5.	( )	( )	( )
6.	( )	( )	( )
7.	( )	( )	( )
8.	( )	( )	( )
9.	( )	( )	( )
10.	( )	( )	( )
11.	( )	( )	( )
12.	( )	( )	( )
13.	( )	( )	( )
14.	( )	( )	( )
15.	( )	( )	( )
16.	( )	( )	( )
17.	( )	( )	( )
18.	( )	( )	( )
19.	( )	( )	( )
20.	( )	( )	( )
21.	( )	( )	( )
22.	( )	( )	( )
23.	( )	( )	( )
24.	( )	( )	( )
25.	( )	( )	( )
26.	( )	( )	( )
27.	( )	( )	( )
28.	( )	( )	( )
29.	( )	( )	( )
30.	( )	( )	( )
31.	( )	( )	( )
32.	( )	( )	( )
33.	( )	( )	( )
34.	( )	( )	( )

STD. 2 STOP HERE

No.	Probably True	Can't Tell	Probably Not True
35.	( )	( )	( )
36.	( )	( )	( )
37.	( )	( )	( )
38.	( )	( )	( )
39.	( )	( )	( )
40.	( )	( )	( )
41.	( )	( )	( )
42.	( )	( )	( )
43.	( )	( )	( )
44.	( )	( )	( )
45.	( )	( )	( )
46.	( )	( )	( )
47.	( )	( )	( )
48.	( )	( )	( )
49.	( )	( )	( )
50.	( )	( )	( )
51.	( )	( )	( )
52.	( )	( )	( )
53.	( )	( )	( )
54.	( )	( )	( )
55.	( )	( )	( )
56.	( )	( )	( )
57.	( )	( )	( )
58.	( )	( )	( )
59.	( )	( )	( )
60.	( )	( )	( )
61.	( )	( )	( )
62.	( )	( )	( )
63.	( )	( )	( )
64.	( )	( )	( )
65.	( )	( )	( )

	I	D	I + D	A	C	A + C
SCORE ⇨						

APPENDIX H

CODING TEACHER QUESTIONS

H.1 Instructions for coders.

H.2 Training programme for coders.

H.1 CODING TEACHER QUESTIONS : SOCIAL STUDIES

INSTRUCTIONS FOR CODERS

A. AIM OF CODING

To read through each tapescript of social studies lessons and code every teacher question and every child question according to the question classification system given below, and to tally each question type.

B. QUESTION CLASSIFICATION SYSTEM

This system has four primary categories and three secondary categories.

The four primary categories are :

1. Cognitive memory questions.
2. Convergent questions.
3. Evaluative questions.
4. Divergent questions.

The three secondary categories are :

5. Grounding questions.
6. Extension questions.
7. Routine questions.

The first three primary categories each have two sub-categories : open and closed.

OPEN means that the question invites two or more acceptable responses.

CLOSED means that the question asks for one answer only

The seven categories are shown diagrammatically:

QUESTION CLASSIFICATION SYSTEM

PRIMARY CATEGORIES			
Cognitive memory	Converg-ent	Eval-uative	Diverg-ent
C L O S E D			
	O P E N		

SECONDARY CATEGORIES		
Ground-ing	Extension	Routine

The diagram shows that Cognitive memory questions fall mostly into the closed sub-category, while only a small proportion are open questions. Convergent questions have approximately equal proportions of closed and open sub-categories, and Evaluative questions are predominantly open with a small proportion closed. Divergent questions are always open.

The following CODING system will be used when coding the tapescripts :

QUESTION CLASSIFICATION SYSTEM : SOCIAL STUDIES

	QUESTION TYPE	CODE
1a.	Cognitive memory - closed	CM-C
1b.	Cognitive memory - open	CM-O
2a.	Convergent - closed	C-C
2b.	Convergent - open	C-O
3a.	Evaluative - closed	E-C
3b.	Evaluative - open	E-O
4.	Divergent	D
5.	Grounding	Gr
6.	Extension	Ex
7.	Routine	R

A brief description of each question type and illustrative questions follows.

1a. COGNITIVE MEMORY - CLOSED (code : CM-C)

These questions are limited to the lowest level of thinking. They call for the memorisation of facts, definitions; in the case of this research, something which the pupils have been told by the television materials or the teacher.

The teacher has one answer in mind when he puts the question,

and the answer is therefore clearly correct or incorrect. This type corresponds to Bloom's knowledge level.

Examples:

1. How far is Tonga from New Zealand ?
2. How many islands are there in Tonga ?
3. What is the largest island called ?

1b. COGNITIVE MEMORY - OPEN (code: CM-O)

Some cognitive memory questions call for two or more answers. Therefore more than one answer is correct and this type is more open than the closed category.

Examples:

1. What kinds of vegetables do the Tongan villagers eat ?
2. What facts did you notice about the gardens ?

2. CONVERGENT.

Most convergent questions can be classified as convergent because they go beyond straight memory recall and yet the teacher has the answers fairly clearly in mind when the question is asked. These questions require pupils to use facts or knowledge they have been presented with to construct an answer.

They correspond to Bloom's comprehension, application, and analysis levels. They call for pupils to explain, state relationships, associate and relate, and compare and contrast.

2a. CONVERGENT - CLOSED (code: C-C)

For these questions, a teacher has one "best" or correct answer in mind.

Examples:

1. What aspect of the climate causes the Tongan villagers to wear light clothing ?
2. What characteristic did the vegetables the

villagers collected have in common ?

2b CONVERGENT - OPEN (code: C-O)

These questions have more than one possible answer, but each answer is based on the construction of an answer from facts. The teacher has the answers in mind, though in practice pupils sometimes produce answers the teacher had not thought of.

Examples:

1. For what reasons do Tongan villagers wear light clothing?
2. How can you tell that it rains a lot in Tonga ?
3. What things show that the Tongan villagers have traded with other countries ?

Coding Problems:

In deciding whether the question is CM or C, it is often necessary to examine the context in which the question occurs, e.g. Was the information called for in the question handled earlier in the discussion, or given in the film ?

3. EVALUATIVE (code : E)

The evaluation question asks pupils to use skills such as making value judgements, judging opinions, justifying a value choice, and giving their opinions.

3a. EVALUATIVE - CLOSED (code: E-C)

These questions call for a "yes-no", or "agree-disagree" answer only. The teacher is asking for a limited response, but a response beyond memory recall. The pupil has to make mental decisions to arrive at "yes" or "no", but the answer does not include reasons, nor does the teacher ask for any.

Examples:

1. Who agrees that the people work hard ?
2. Who enjoyed that film ?
3. John, do you agree with Mary's opinion?

3b EVALUATIVE - OPEN (code: E-O)

These questions ask for more than just a yes-no type answer. The pupil is required to give more extended comments involving value judgements or reasons, and involve the exploration of people's feelings and emotions.

Examples:

1. Why would it be better for the villagers to change part of their diet ?
2. Do you think we should give some kind of aid to these people ?
3. What are your reasons for liking the village way of life ?

Other phrases often used :

"How do you feel about...."

"What do you think about... "

"In your opinion..."

Coding problems:

Often the answer a pupil gives determines the actual classification of open or closed and this can be difficult. Also the teacher's intention can usually be worked out from what preceded the question and what followed. For example, if a teacher accepts a yes-no answer, then his intention was to ask a closed question, but if reasons are asked for, then the question is classified as open:

T. Do you think we could learn anything from the Tongan villagers ?

P. Yes.

T. Why do you think so ?

P. Because they could teach us about how to co-operate more.

T. Good. Has anyone else any reasons ?

The first question is open because the teachers intention made it so. If the teacher had been satisfied with the "Yes" answer, the question would have been closed.

4. DIVERGENT (code: D).

Divergent questions call for the use of imagination and originality by the responder. They are thought-provoking and encourage the responder to organise known data into new patterns that he (and perhaps the class or even the teacher) was not aware of before. However, every response does not have to be original in this way. The divergent question is broad and open, calling upon a range of possible answers. Therefore the teacher has no fixed answer in mind when the question is asked.

Sometimes divergent questions create new problem situations and the responder has to synthesise ideas and construct solutions. Prediction, inference, and hypothesising are important thinking processes involved in answering divergent questions.

Examples:

1. How might the villagers lives change if the climte suddenly became much colder ?
2. What do you think would happen if oil was discovered in Tonga ?
3. Suppose the villagers were given a tractor by the government - how might this change their lives?
4. What would happen to the villagers if the coconut trees died of disease ?

Coding problem:

There is often an overlap between evaluation and divergent questions. The difference in classifying lies in implicit as opposed to explicit requests for value judgements. For

example, the questions above have the evaluation present by inference.

5. GROUNDING (code: Gr)

This teacher question is one which calls upon a child (or class) to ground what has been given as an answer. Therefore it usually occurs as a result of something that has been said by a pupil. The teacher considers the answer given to be inadequate or too limited, and calls upon the pupil to give reasons or justification.

Example:

T. If you gave the Tongan villagers a gift, what would it be ?

P. A rotary hoe.

T. Why, Stephen ?

P. Because ..... (gives reason).

The "Why, Stephen" requests the pupil to ground his initial answer. The key word is "why".

Caution: often "why" is used by teachers when they are simply asking for memory recall, or convergent thinking, as part of an initial question.

6. EXTENSION (code : Ex)

This teacher question is

either a specific invitation to a pupil to add to what he has given as an answer,

e.g. T. Can you expand on that a little ?

or an open invitation to all pupils to add to what one pupil has said,

e.g. T. Can anyone add to John's answer?

or an open invitation to all pupils to add to something the teacher has said.

e.g. T. Would anyone like to add to what I said ?

So this question is intended to add further reasons or ideas or opinions or facts to answer or statement.

Example :

P. The women seemed to prepare the food and the men prepared the fire.

T. Right. What else can you tell me ?

P. The women got the seafood too, and the men got the vegetables.

7. ROUTINE (code : R)

These questions relate to the management of the classroom discussion as a whole. They help keep an overall "control" of the discussion and keep the discussion flowing so that everyone can see and hear what is going on. They can, therefore, aid participation or hinder it.

Examples:

1. T. Would you say that again please ?

2. T. Could you hear what was said, Ann?

3. T. Does anyone know the answer ?

4. T. Did you want to say something, Bill?

C. CODING PITFALLS TO WATCH FOR

1. The transcripts show that sometimes teachers use phrases in questions that suggest an open question, but the question is really asking for memory.

e.g. T. What do you think the village is called ?

The village name was given in the film so the question is cognitive memory.

2. Repeated questions : Where a teacher asks a question, then immediately repeats it, do not code the repeat

But if other talk occurs between the initial question and the repeat, then the repeat is coded.

3. Where a teacher asks or invites a child to answer by saying the child's name in a question-like way, do not code.
Example : T. What is the name of the village ? Tom?
Code the first question; do not code the "Tom ?"

D. PROCEDURE FOR CODING:

1. There are three teaching packages on which the lessons recorded on the tapescripts are based : Tonga, Hopi, and Temiar.

The coding will be done in three "waves" to correspond with these packages.

2. The procedure for each "wave" is :

   a. View the TV film of the teaching material.
   b. Collect tapescripts from the researcher.
   c. Code the tapescript : enter the code letters in the right-hand column provided - at the end of each teacher question.
   d. When the tapescript has been coded, enter the totals for each question type on the tally sheet provided.
   e. For any doubtful cases that require further discussion between coders and researcher, enter a question mark (in red) to the left of the question on the tapescript.

3. Coders and researcher will meet regularly at times to be arranged.

The format of the tally sheet is :

Tapescript No. _____ McGee Research.

Coder: _____

TALLY SHEET : TEACHER QUESTIONS.

RAW SCORE OF QUESTIONS BY TYPE.

	CM-C	CM-O	C-C	C-O	E-C	E-O	D	Gr.	Ex.	R	TOTAL
raw score											
per cent of all questions											

E. ADDITIONAL CLARIFICATION FOR CODING

1. Where square brackets are used in the transcripts, e.g.

3 I D wds they represent additions I have made. This system is used when indistinct talk occurred, e.g. in the brackets above, the meaning is "three indistinct words".

2. Repeats

When a teacher repeats a pupil answer in a question form, but in a way which shows that he is not really seeking an answer, do not code.

3. Rhetorical question. Do not code.

Where a question is asked for effect, not to get an answer from a pupil, e.g. "Who cares?" "Is that so?"

4. Statements as questions

Sometimes a teacher is in effect asking a question by making a statement. From the statement we infer a question because the pupils respond as if the statement had been a question.

e.g. T. I wondered - when I saw the film - where those people got their knives from.

P. I think they'd get them by trading for them.

In coding the statement would become the question : "Where did those people get their knives ?" It is coded only if it gets an answer.

5. Where the teacher uses a "Yes?" to invite a pupil to answer, do not code. But if it does not directly follow a question, then code as R.

6. Grounding. Include as grounding questions like

"Can you give me an example of that ?"

7. Clarification of meaning. When a teacher asks a pupil to clarify an answer, the teacher question is coded as CM-C

e.g. T. What did they put around the food ?

P. Palm leaves.

T. Yes, palm leaves. Which ones do you mean ?

Note: This does not include requests to repeat an answer.

8. Command question. Like statements (above) there are times when a command is, in effect, a question and should be coded as such.

e.g. T. Tell me all the facts you can about the village we saw in the film (CM-O).

C.F. McGee

H.2 TRAINING PROGRAMME FOR CODERS

Meeting 1

The purpose of the coding was explained to the two coders: to code the types of teacher questions from 72 lesson transcripts of social studies lessons based on three study topics.

The question categories to be used in coding the transcripts were introduced in the following way. Reference was firstly made to the Guilford Structure-of-Intellect model upon which the primary questions were based. The coders were familiar with Guilford's work, having studied a Master's course which included his theory of intellect. Reference was then made to the Aschner-Gallagher classification system for analysing classroom discourse. Again, the coders were familiar with this system, even though they had had no experience in coding into its categories. The division of questions into primary (or initial) and secondary (or follow-up) was introduced.

Following this introduction, a systematic study was made of the notes 'Coding Teacher Questions: Social Studies : Instructions for Coders' (refer Appendix H.1). Each of the seven question categories was discussed fully and practice at coding lists of questions given.

When the trainees were reasonably familiar with the question categories and were able to readily agree on their practice classifications, the television materials for the Tonga lesson (which had been the basis of the pretreatment lessons in the research design) were shown. This was necessary because transcripts of pilot study lessons (based on the Tonga material) were used as practise transcripts for the coders and it was therefore essential for them to know what information had been given to the pupils before the class discussion began so that primary question categories could be distinguished.

A pilot transcript was then coded by the trainees. The first two pages were coded and this was followed by a discussion of each question. Reasons for coding the question into a particular category were given by the two trainees and the researcher in turn, and disagreements were discussed until a measure of agreement was reached. This usually meant looking both back and forward in the transcript to determine the context in which the question was asked and the level

or type of thought the answering of the question would demand. The remaining nine pages of this pilot transcript were treated similarly, viz., two pages at a time. During this phase of the training frequent reference was made to the ground rules governing factors such as repeated questions, rhetorical questions, and 'command' questions (refer Appendix H.1).

Three practice transcripts were issued to the trainees. Each trainee had the same three transcripts but they did not know this. They were asked to code the three lessons (based on the television material on Tonga) and bring them to the next training meeting. It was also suggested that they check each transcript twice, the second time after a delay to gain a measure of their consistency. The trainees were asked to telephone the investigator if any 'problem' questions could not be resolved.

The duration of the above meeting was 3 hours.

Meeting 2

This meeting was held 4 days after the first. The practice transcripts were discussed with each trainee in general terms at first. Then each of the three transcripts was checked systematically as described above. Disagreements about a question classification were discussed fully.

The agreement level (calculated by the percentage of categories both coders and the investigator coded similarly) was above 70% over these three transcripts.

The trainees were given two further practice transcripts.

This meeting was of 2 hours duration.

Meeting 3

In this meeting a systematic check was made of the practice transcripts. The investigator considered that the level of agreement was probably as high as it could be without further extensive training, for the mean level over each transcript exceeded 75%. There was — naturally — variation in individual question categories.

This meeting lasted for nearly one hour. The total training time was therefore about 7½ hours — based on 5½-6 hours of intensive training in meetings and 1½-2 hours of practice individually.

Coding

The coding of the transcripts was carried out in three 'waves'. The first was the coding of the transcripts of the lesson on a Tongan village.

Second, the trainees were shown the film and the written lesson materials on the Hopi Indians. They then coded the transcripts of those lessons. Third, the transcripts of the Temiar lessons were coded after the coders had been shown the lesson materials.

Procedures for checking inter- and intra-coder reliability are described in Chapter 6. Incidentally, the two coders had no knowledge of the research project or design. All transcripts were labelled with codes so that no teacher identification was possible.

BIBLIOGRAPHY

Adams, R.S. and Biddle, B.J. (1970) Realities of Teaching. New York: Holt, Rinehart and Winston.

Allen, D.W., Ryan, K.A., Bush, R.N. and Cooper, J.M. (1969) Questioning Skills: Teacher's Manual. Canada: General Learning Corporation.

Amidon, E.J. and Hunter, E. (1966) Improving Teaching - The Analysis of Classroom Verbal Interaction. New York: Holt, Rinehart and Winston.

Amidon, E.J. and Hunter, E. (1967) Verbal interaction in the classroom: The Verbal Interaction Category System. In Amidon, E.J. and Hough, J.B. (eds.), Interaction Analysis. Reading: Addison-Wesley Publications Co., p.141-149.

Aschner, M.J.M. (1961) Asking questions to trigger thinking. NEA Journal, 50, 44-66.

Aschner, M.J.M. *et al.* (1965) A System of Classifying Thought Processes in the Context of Classroom Verbal Interaction. Institute for Research on Exceptional Children. University of Illinois.

Baker, M.R. (1970) Training Prospective Social Studies Teachers in Aspects of the Inquiry Method: the Effects of Different Models on a Trainee's Attitudes, Intentions, and Behaviours. Unpublished doctoral thesis. Ann Arbor: University of Michigan (microfilm).

Bandura, A. (1962) Social learning through imitation. In Jones, M.R. (ed.) Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, p.211-269.

Bellack, A.A., Kliebard, H.M., Hyman, R.T. and Smith, F.L. (1966) The Language of the Classroom. New York: Teachers College Press, Columbia University.

Benne, K.D. (1967) The major tasks of contemporary thinking. In Fair, J. and Shaftel, F.R. (eds.) Effective Thinking in the Social Studies: Thirty-seventh Yearbook. Washington, D.C.: National Council for the Social Studies, p.1-24.

Beyer, B.K. (1971). Inquiry in the Social Studies Classroom. Columbus, Ohio: Charles E. Merrill Publishing Co.

Bloom, B.S. (ed.) (1956) Taxonomy of Educational Objectives, Handbook 1: Cognitive Domain. New York: McKay.

Borg, W.R., Kelly, M.L., Langer, P. and Gall, M.D. (1970) The Mini-course: A Microteaching Approach to Teacher Education. Beverly Hills, California: Macmillan Educational Services Inc.

Borg, W.R. (1972) The minicourse as a vehicle for changing teacher behaviour: a three-year follow-up. Journal of Educational Psychology, 63, 572-79.

Borg, W.R. (1975) Moving towards a breakthrough in teacher education. Education, 95, 302-23.

Brown, B., Ober, R., Soar, R. and Webb, J.N. (1968) The Florida taxonomy of cognitive behaviors. In Dunkin, M.J. and Biddle, B.J. The Study of Teaching. New York: Holt, Rinehart and Winston, p.237-241.

Brown, G. (1975) Microteaching: A Programme of Teaching Skills. London: Methuen.

Brubacher, .S. (1966) A History of the Problems of Education. New York: McGraw-Hill.

Bruner, J.S. (1957) Going beyond the information given. In Contemporary Approaches to Cognition. Cambridge: Harvard University Press, p.41-69.

Bruner, J.S. (1960) The Process of Education. Cambridge: Harvard University Press.

Bruner, J.S. (1961) The act of discovery. Harvard Educational Review, 31, 21-32.

Bruner, J.S. (1963) The Process of Education. Cambridge: Harvard University Press.

Bruner, J.S. (1966) Towards a Theory of Education. Cambridge: The Belknap Press of Harvard University Press.

Cameron-Jones, M. and Morrison, A. (1973) Teachers assessments of their pupils. In Chanan, G. (ed.) Towards a Science of Teaching. Slough: National Foundation for Educational Research, p.26-59.

Campbell, D.J. and Stanley, J.C. (1963) Experimental and quasi-experimental designs for research on teaching. In Gage, N.L. (ed.) Handbook of Research on Teaching. Chicago: Rand McNally and Co.

Carpenter, H. (1967) The role of skills in elementary social studies, Social Education, 31, 221-27.

Chaudhari, U.S. (1975) Questioning and creativity: research perspective. Journal of Creative Behaviour, 9, 30-34.

Church, R.J. (1971) The effects of systematic changes in Standard Four science lessons. Educational Research Newsletter, 4. Department of Education, University of Canterbury.

Clegg, A.A. (1971) Classroom questions. In Deighton, L.C. (ed.) Encyclopedia of Education (Vol.8). The Macmillan Company and the Free Press. p.184-190.

Cooley, W.W. and Lohnes, P.R. (1971) Multivariate Data Analysis. New York: John Wiley and Sons.

Cordier, R. (1968) What should children learn through social studies? Elementary School Journal, 69, 55-68.

Courtney, P.E. (1972) In-service Education: A Survey of Opinions and Needs of Primary Teachers in the Canterbury Education Board District. Christchurch: University of Canterbury.

Crabtree, C. (1967) Effects of structuring on the productiveness of children's thinking. Journal of Experimental Education, 36, 1-13.

Crabtree, C. (1970) Inquiry approaches: how new and how valuable? In McLendon, J.C., Joyce, W.W. and Lee, J.R. Readings on Elementary Social Studies. Boston: Allyn and Bacon, p.324-331.

Cronbach, L.J. and Furby, L. (1970) How should we measure 'change' — or should we? Psychological Bulletin, 74, 68-80.

Cunningham, R.T. (1971) Developing question-asking skills. In Weigand, J. (ed.) Developing Teacher Competencies. Englewood Cliffs, New Jersey: Prentice-Hall, p.81-130.

Curriculum Development Unit (1972) Social Studies Newsletter No.6, Draft Syllabus, Forms 1 to 4. Wellington: Department of Education.

Curtis, S.J. and Boultwood, M.E.A. (1964) An Introductory History of English Education Since 1800. London: University Tutorial Press.

Davis, O.L. and Hunkins, F.P. (1966) Text-book questions: what thinking processes do they foster? Peabody Journal of Education, 43, 285-292.

Davis, O.L. and Tinsley, D.C. (1968) Cognitive objectives revealed by classroom questions asked by social studies student teachers. In Hyman, R.T. (ed.) Teaching: Vantage Points for Study. Philadelphia: J.B. Lippincott Company.

Day, H.I. and Berlyne, D.E. (1971) Intrinsic motivation. In Lesser, G.S. (ed.) Psychology and Educational Practice. Glenview, Illinois: Scott, Foresman and Company, p.294-335.

Dewey, J. (1915) The Child and the Curriculum: The School and Society. Chicago: University of Chicago Press.

Dewey, J. (1916) Democracy in Education. New York: Macmillan.

Dewey, J. (1933) How We Think: A Restatement of the Relation of Reflective Thinking to the Education Process. Boston: D.C. Heath and Company.

Dewey, J. (1938) Experience and Education. New York: Macmillan.

Dunfee, M. and Sagl, H. (1966) Social Studies Through Problem Solving. New York: Holt, Rinehart and Winston.

Dunkin, M.J. and Biddle, B.J. (1974) The Study of Teaching. New York: Holt, Rinehart and Winston.

Dunkin, M.J. (1976) Problems in classroom research. British Journal of Teacher Education, 2, 169-187.

Elley, W.B. and Reid, N.A. (1969) Progressive Achievement Tests: Teachers Manual: Reading Comprehension, Reading Vocabulary. Wellington: New Zealand Council for Educational Research.

Elliott, J. and Adelman, C. (1973) Towards a General Methodology of Inquiry/Discovery Teaching. Ford Teaching Project, Document I (unpublished).

Elliott, J. and Adelman, C. (1974) The Aspirations and Realities of the Inquiry/Discovery Teacher. Ford Teaching Project, Document N (unpublished).

Elliott, J. and Hurlin, T. (n.d.) Self-monitoring Questioning Strategies. Ford Teaching Project, Centre for Applied Research in Education.

Estvan, F.J. (1968) Social Studies in a Changing World. New York: Harcourt, Brace and World.

Fair, J. and Shaftel, F.R. (eds.) (1967) Effective Thinking in the Social Studies: 37th Yearbook. Washington: National Council for the Social Studies.

Fenton, E. (1966) Teaching the New Social Studies in Secondary Schools. New York: Holt, Rinehart and Winston.

Festinger, L. (1962) A Theory of Cognitive Dissonance. Stanford: Stanford University Press.

Flanders, N.A. (1967) Some relationships among teacher influence, pupil attitudes and achievement. In Amidon, E.J. and Hough, J.B. (eds.) Interaction Analysis: Theory, Research and Application. Reading, Massachusetts: Addison-Wesley, p.217-242.

Flanders, N.A. (1970) Analyzing Teaching Behavior. Reading, Massachusetts: Addison-Wesley.

Francis, K.A.E. (1971) A Study of the effects of teacher intention and class level on teaching behaviour and pupil thinking and learning in the classroom. Unpublished M.A. thesis, University of Canterbury.

Franklin, B.S. and Richards, P.N. (1977) Effects on children's divergent thinking abilities of a period of direct teaching for divergent production. British Journal of Educational Psychology, 47, 66-70.

Freyberg, P.S., Katterns, R.W. and Rogers, B. (1974) University of Waikato Teacher Education Project, Report No.1. Occasional Papers in Education. Hamilton: University of Waikato.

Friedlander, B.Z. (1965) A psychologist's second thoughts on concepts, curiosity, and discovery in teaching and learning. Harvard Educational Review, 35, 18-38.

Gagné, R.M. (1966) Varieties of learning and the concept of discovery. In Shulman, L.E. and Keisler, E.R. (eds.) Learning by Discovery: A Critical Appraisal. Chicago: Rand - McNally and Company, p.135-150.

Galassi, J.P., Gall, M.D., Dunning, B. and Banks, H. (1974) The use of written versus videotape instruction to train teachers in questioning skills. Journal of Experimental Education, 43, 16-23.

Gall, M.D. (1970) The use of questions in teaching. Review of Educational Research, 40, 707-721.

Gallagher, J.J. (1965) Productive Thinking in Gifted Children. Urbana: University of Illinois, USOE Cooperative Research Project No.965.

Gallagher, J.J. (1970) Three studies of the classroom. In Gallagher, J.J., Nuthall, G.A., and Rosenshine, B. (eds.) Classroom Observation. Chicago: Rand-McNally Company.

Gallagher, J.J. and Aschner, M.J. (1963) A preliminary report: analysis of classroom interaction. Merrill-Palmer Quarterly of Behaviour and Development, 9, 183-199.

Gallagher, J.J., Aschner, M.J. and Jenné, W. (1967) Productive Thinking of Gifted Children in Classroom Interaction. Washington, D.C.: The Council for Exceptional Children.

Getzels, J.W. and Dillon, J.T. (1973) The nature of giftedness and the education of the gifted. In Travers, R.M.W. (ed.) Second Handbook of Research on Teaching. Chicago: Rand-McNally and Company, p.689-731.

Getzels, J.W. and Jackson, P.W. (1962) Creativity and Intelligence. New York: John Wiley and Sons.

Godbold, J.V. (1970) Oral questioning practices and teachers in social studies classes. Educational Leadership, 28, 61-67.

Gronlund, N.E. (1968) Constructing Achievement Tests. Englewood Cliffs, New Jersey: Prentice Hall.

Guilford, J.P. (1956) The structure of intellect. Psychological Bulletin, 53, 267-293.

Guilford, J.P. (1959) Three faces of intellect. American Psychologist, 14, 469-479.

Guilford, J.P. (1967) Creativity: yesterday, today and tomorrow. Journal of Creative Behavior, 1, 3-14.

Guilford, J.P. and Fruchter, B. (1973) Fundamental Statistics in Psychology and Education. New York: McGraw-Hill.

Guszak, F.J. (1967) Teacher questioning and reading. The Reading Teacher, 21, 227-234.

Hallman, R.J. (1963) The necessity and sufficient conditions of creativity. In Gowan, J.C., Demos, G.D. and Torrance, P.E. (eds.) (1967) Creativity: its Educational Implications. New York: John Wiley and Sons, p.16-30.

Halloran, J.D. (1967) Attitude Formation and Change. Leicester: Leicester University Press.

Heath, R.W. and Nielson, M.A. (1974) The research basis for performance-based teacher education. Review of Educational Research, 44, 463-484.

Hilgard, E.R. (1967) Introduction to Psychology. New York: Harcourt, Brace and World.

Hough, J.B. (1965) The dogmatism factor in the human relations training of pre-service teachers. Paper cited in Hough, J.B. and Ober, R. The effect of training in interaction analysis on the verbal teaching behavior of pre-service teachers. In Amidon, E.J. and Hough, J.B. (eds.) (1967) Interaction Analysis. Reading, Massachusetts: Addison-Wesley Publishing Company, p.329-345.

Hough, J.B. and Duncan, J.K. (1970) Teaching: Description and Analysis. Reading, Massachusetts: Addison-Wesley.

Huck, S.W., Cormier, W.H. and Bounds, W.G. (1974) Reading Statistics and Research. New York: Harper and Row.

Hunkins, F.P. (1966) Using questions to foster pupils' thinking. Education, 87, 83-87.

Hunkins, F.P. (1968) The influence of analysis and evaluation questions on achievement in 6th grade social studies. In Herman, W.L. (ed.) Current Research in Elementary School Social Studies. London: Macmillan, p.319-325.

Hunter, E. (1972) Encounter in the Classroom. New York: Holt, Rinehart and Winston.

Hurst, J.B. (1974) Competency-based modules and inquiry teaching. Journal of Experimental Education, 43, 35-9.

Hutchinson, W.L. (1967) Creative and productive thinking in the classroom. Journal of Creative Behavior, 1, 419-27.

Johnson, J.S. (1969) Change in student teacher dogmatism. Journal of Educational Research, 62, 224-26.

Kagan, J. (1966) Learning, attention and the issue of discovery. In Schulman, L.E. and Keisler, E.R. (eds.) Learning by Discovery: A Critical Appraisal. Chicago: Rand, McNally and Company, p.151-161.

Kaplan, A. (1964) The Conduct of Inquiry. San Francisco: Chandler Publishing Company.

Kaufman, B.B. (1972) A Contemporary review of the inquiry method of teaching and learning: a study of current definitions and rationales of the inquiry method of teaching and learning - 1960-1970. Unpublished doctoral thesis. New York: New York University (microfilm).

Kirk, J. (1967) Elementary school student teachers and interaction analysis. In Amidon, E.J. and Hough, J.B. (eds.) Interaction Analysis. Reading, Massachusetts: Addison-Wesley Publishing Company, p.299-306.

Klein, M.F. (1972) Use of Taxonomy of Educational Objectives (Cognitive Domain) in constructing tests for primary school pupils. Journal of Experimental Education, 40, 38-50.

Ladd, G.T. and Anderson, H.O. (1970) Determining the level of inquiry in teachers' questions. Journal of Research in Science Teaching, 7, 395-400.

Lawton, D., Campbell, J. and Burkitt, V. (1971) Social Studies 8-13. Schools Council Working Paper 39. London: Evans/Methuen Educational.

Lawton, D. and Dufour, B. (1973) The New Social Studies: A Handbook for teachers in primary, secondary and further education. London: Heinemann Educational.

Lefrancois, G.R. (1975) Psychology for Teaching. Belmont, California: Wadsworth Publishing Company Inc.

Lehman, I.J. (1963) Changes in critical thinking attitudes and values from the freshman to senior years. Journal of Educational Psychology, 54, 305-315.

Lindvall, C.M. and Nitko, A.J. (1975) Measuring Pupil Achievement and Aptitude. New York: Harcourt Brace Jovanovich, Inc.

Linn, R.L. and Slinde, J.A. (1977) The determination of the significance of change between pre- and post-testing periods. Review of Educational Research, 47, 121-150.

Lord, F.M. (1967) Statistical adjustment when comparing pre-existing groups. Psychological Bulletin, 72, 336-37.

Loree, M.R. (1971) Shaping teachers' attitudes. In Smith, B.O. Research in Teacher Education. Englewood Cliffs: Prentice-Hall, p.99-118.

McGuire, J.C. and Rowland, G.T. (1971) Piaget, Jean: Theories. In Deighton, L.C. (ed.) The Encyclopedia of Education (Vol.7). The Macmillan Company and The Free Press, p.141-152.

McNaughton, A.H., Wallen, N.E., Ho, S.K. and Crawford, W.R. (1967) The use of teaching modules to study high-level thinking in the social studies. Journal of Teacher Education, 18, 495-502.

McNaughton, A.H. (1974) Social Studies Inference Test: Teachers' Manual. Auckland: Auckland Education Board.

McNemar, Q. (1962) Psychological Statistics. New York: John Wiley and Sons.

Marsh, C.J. (1975) Inquiry teaching in social studies and the social sciences: a critical review of research findings, 1967-1972. Australian Journal of Education, 19, 276-283.

Massialas, B.G. and Zevin, J. (1964) Teaching social studies through discovery. Social Education, 28, 384-387.

Massialas, B.G. and Cox, C.B. (1966) Inquiry in Social Studies. New York: McGraw-Hill.

Massialas, B.G. and Zevin, J. (1967) Creative Encounters in the Classroom. New York: John Wiley and Sons.

Massialas, B.G. and Sprague, N.F. (1974) Teaching social issues as inquiry: a clarification. Social Education, 39, 10-19.

Massialas, B.G., Sprague, N.F. and Hurst, J.B. (1975) Social Issues Through Inquiry: Coping with an Age of Crises. New Jersey: Prentice-Hall.

Medley, D.M. and Mitzel, H.E. (1963) Measuring classroom behavior by systematic observation. In Gage, N.L. (ed.) Handbook of Research on Teaching. Chicago: Rand, McNally, p.247-329.

Merwin, W.C. and Schneider, D.O. (1973) The use of self-instructional modules in the training of social studies teachers to employ higher cognitive level questioning strategies. Journal of Educational Research, 67, 13-18.

Michaelis, J.U. (1975) Social Studies for Children in a Democracy. New Jersey: Prentice-Hall.

Mohan, M. and Hull, R.E. (1975) A model for in-service education of teachers. Educational Technology, 15, 41-4.

New Zealand Council for Educational Research (1969) Otis Tests of Mental Ability: Manual of Directions.

Nie, N.H., Hull, C.H., Jenkins, J.G., Steinbrenner, K. and Bent, D.H. (1975) Statistical Packages for the Social Sciences. (2nd ed.) New York: McGraw-Hill.

Nuthall, G.A. and Lawrence, P.J. (1965) Thinking in the Classroom. Wellington: New Zealand Council for Educational Research.

Nuthall, G.A. (1970) A review of some selected recent studies of classroom interaction and teaching behaviour. In Gallagher, J.J., Nuthall, G.A. and Rosenshine, B. Classroom Observation. Chicago: Rand, McNally and Company, p.6-29.

Ober, R.L., Bentley, E.L. and Miller, E. (1971) Systematic Observation of Teaching. New Jersey: Prentice-Hall.

O'Connor, E.F. (1972) Extending classical test theory to the measurement of change. Review of Educational Research, 42, 73-98.

Olson, A.L. (1974) Can we individualize in-service education of teachers? Educational Technology, 14, 41-2.

Oppenheim, A.N. (1966) Questionnaire Design and Attitude Measurement. London: Heinemann.

Parnes, S.J. (1963) Education and creativity. Teachers College Record, 64, 331-39.

Parnes, S.J. (1967) Education and creativity. In Gowan, J.C., Demos., G.D. and Torrance, E.P. Creativity: Its Educational Implications. New York: John Wiley and Sons, p.32-42.

Peck, R.F. and Tucker, J.A. (1973) Research on teacher education. In Travers, R.M.W. (ed.) Second Handbook of Research on Teaching. Chicago: American Educational Research Association, p.940-978.

Perlberg, A. (1972) Microteaching. In Flanders, N. and Nuthall, G. The classroom behaviour of teachers. International Review of Education, Special Number 18, 547-559.

Piaget, J. (1950) The Psychology of Intelligence. London: Routledge.

Ploghoft, M.E. and Shuster, A.H. (1971) Social Science Education in the Elementary School. Columbus, Ohio: Charles E. Merrill Publishing Company.

Porterfield, D. (1974) Influence of inquiry-discovery science preparation on questioning behaviour of reading teachers. The Reading Teacher, 27, 589-593.

Postman, N. and Weingartner, C. (1969) Teaching as a Subversive Activity. Middlesex, England: Penguin.

Rogers, C. (1959) Toward a theory of creativity. In Anderson, H.H. (ed.) Creativity and its Cultivation. New York: Harper and Row, p.44-54.

Rogers, O.A. and Genovese, S.L. (1969) Inquiry in the primary grades. Social Education, 33, 538-540.

Rogers, V. (1972) Modifying questioning strategies of teachers. Journal of Teacher Education, 23, 58-62.

Rokeach, M. (1960) The Open and Closed Mind. New York: Basic Books.

Rokeach, M. (1968) The nature of attitudes. International Encyclopedia of the Social Sciences, Vol.1. The Macmillan Company and the Free Press, p.449-457.

Rosenshine, B. (1971) Teaching Behaviours and Student Achievement. Slough: National Foundation for Educational Research.

Rosenshine, B. and Furst, N. (1971) Research on teacher performance criteria. In Smith, B.O. (ed.) Research in Teacher Education: A Symposium. Englewood Cliffs, New Jersey: Prentice-Hall, p.37-72.

Rosenshine, B. and Furst, N. (1973) The use of direct observation to study teaching. In Travers, R.M.W. (ed.) Second Handbook of Research on Teaching. Chicago: Rand, McNally, p.122-183.

Rossman, J. (1931) The Psychology of the Inventor. Washington, D.C.: Investors Publishing Company.

Rubin, L.J. (ed.) (1973) Improving In-service Education: Proposals and Procedures for Change. Boston: Allyn and Bacon.

Ryan, F.L. (1971) Exemplars for the New Social Studies. Englewood Cliffs, New Jersey: Prentice-Hall.

Ryan, F.L. (1973) Differentiated effects of levels of questioning on student achievement. Journal of Experimental Education, 41, 63-7.

Ryan, F.L. and Carlson, M.A. (1973) The relative effectiveness of discovery and expository strategies of teaching toward economic concepts with First Grade students. Journal of Educational Research, 66, 446-50.

Ryan, F.L. (1974) The effects on social studies achievement of multiple student responding to different levels of questioning. Journal of Experimental Education, 42, 71-5.

Ryan, F.L. and Ellis, A.K. (1974) Instructional Implications of Inquiry. New Jersey: Prentice-Hall.

Ryan, T. (1969) A Program of Inquiry Training for In-service Teachers. Unpublished doctoral thesis. East Lansing: Michigan State University (microfilm).

Ryans, D.G. (1960) Characteristics of Teachers. Washington, D.C.: American Council on Education.

Saadeh, I.Q. (1970) Teacher effectiveness or classroom efficiency: a new direction in the evaluation of teaching. Journal of Teacher Education, 21, 73-91.

Samph, T. (1976) Observer effects on teacher verbal classroom behaviour. Journal of Educational Psychology, 68, 736-41.

Sanders, N.M. (1966) Classroom Questions: what kinds? New York: Harper and Row.

Sanders, N.M. and Tanck, M.L. (1970) A critical appraisal of twenty-six national social studies projects. Social Education, 34, 383-447.

Schreiber, J.E. (1967) Teachers' question-asking techniques in Social Studies. Unpublished doctoral thesis. University of Iowa (microfilm).

Scott, M.V. (1955) Reliability of content analysis: the case of nominal coding. Public Opinion Quarterly, 19, 321-25.

Shindelus, M.J. and Durkin, M.C. (1972) People in Families (Teachers' Guide). Menlo Park, California: Addison-Wesley Publishing Company.

Simon, H.A. (1967) Understanding creativity. In Gowan, J.C., Demos, G.D. and Torrance, E.P. (eds.) Creativity: Its Educational Implications. New York: John Wiley and Sons, p.43-53.

Skeel, D. and Decaroli, J.G. (1969) The role of the teacher in an inquiry-centred classroom. Social Education, 33, 547-550.

Smith, B.O. and Meux, M.O. (1962) A Study of the Logic of Teaching. Urbana, Illinois: University of Illinois Press.

Smith, B.O.,and Meux, M.O., Coombes, J. and Nuthall, G.A. (1964) A Tentative Report on the Strategies of Teaching. Urbana, Illinois: University of Illinois.

Smith, B.O. *et al.* (1969) Teachers for the Real World. Washington, D.C.: American Association of Colleges for Teacher Education.

Snyder, W.D. and Runkel, P.J. (1975) Can teachers be trained to change? Some effects of training on teacher-student interaction assessed by Flanders' categories. Classroom Interaction Newsletter, 10, 19-31.

Suchman, J.R. (1961) Inquiry training: building skills for autonomous discovery. Merrill-Palmer Quarterly of Behaviour and Development, 7, 147-169.

Suchman, J.R. (1962) Creative thinking and conceptual growth. Gifted Child Quarterly, 6, 96-9.

Taba, H., Levine, S. and Elzey, F. (1964) Thinking in Elemetary School Children. U.S. Dept. of Health, Education and Welfare. Cooperative Research Project No,1574. San Francisco State College.

Taba, H. (1965) Techniques of in-service training. Social Education, 29, 473-476.

Taba, H. (1966) Teaching Strategies and Cognitive Functioning in Elementary School Children. U.S. Dept. of Health, Education and Welfare. Cooperative Research Project No.2404. San Francisco State College.

Taba, H., Durkin, M.C., Fraenkel, J.R. and McNaughton, A.H. (1971) A Teacher's Handbook to Elementary Social Studies: An Inductive Approach. Reading, Massachusetts: Addison-Wesley.

Thomas, R.M. and Brubacher, D.L. (1971) Curriculum Patterns in Elementary Social Studies. California: Wadsworth.

Timms, A.F. (1975) An Analysis of classroom teachers translations of the ideas gained from in-service experiences into classroom procedures. Unpublished doctoral thesis. Pittsburgh: University of Pittsburgh (microfilm).

Tinsley, D.C. and Davis, O.L. (1971) Questions used by secondary student teachers to guide discussion and testing in social studies: a study in planning. Journal of Teacher Education, 22, 59-65.

Tisher, R.P. (1970) A Study of Verbal Interaction in Science Classes and its Association with Pupils' Understanding in Science. St. Lucia: University of Queensland Press.

Torrance, E.P. (1962) Guiding Creative Talent. Englewood Cliffs, New Jersey: Prentice-Hall.

Torrance, E.P. (1966) Torrance Tests of Creative Thinking: Directions Manual and Scoring Guide. Princeton, New Jersey: Personnel Press, Inc.

Torrance, E.P. (1967) Must creative development be left to chance? In Gowan, J.G., Demos, G.D. and Torrance, E.P. (eds.) Creativity: Its Educational Implications. New York: John Wiley and Sons, p.96-105.

Torrance, E.P. (1972) Can we teach children to think creatively? The Journal of Creative Behaviour, 6, 114-143.

Traill, R.D., Logan, L.M. and Rimmington, G.T. (1972) Teaching the Social Sciences: A Creative Direction. Sydney: McGraw-Hill.

Tuckman, B.W. (1975) Measuring Educational Outcomes: Fundamentals of Testing. New York: Harcourt, Brace and Jovanovich.

Turney, C., Clift, J.C., Dunkin, M.J. and Traill, R.D. (1973) Microteaching: Research, Theory and Practice. Sydney: Sydney University Press.

Vernon, P.E. (1973) How to spot the creative. New Society, 26, 564.

Wallach, M.A. and Kogan, N. (1965) Modes of thinking in young children: A study of the creativity-intelligence distinction. New York, Holt, Rinehart and Winston.

Wallen, N.E., Durkin, M.C., Fraenkel, J.R., McNaughton, A.H. and Sawin, E.I. (1969) The Taba Curriculum Development Project in Social Studies: Final Report. U.S. Department of Health, Education and Welfare. San Francisco State College.

Winer, B.J. (1971) Statistical Principles in Experimental Design (2nd ed.) New York: McGraw-Hill.

Wodtke, K.H. and Wallen, N.E. (1965) The effects of teacher control in the classroom on pupils' creativity scores. American Educational Research Journal, 2, 75-82.

Wragg, E.C. (1974) Teaching Teaching. Newton Abbot, London: David and Charles.

Wright, C.J. and Nuthall, G.A. (1970) Relationships between teacher behaviors and pupil achievement in three experimental elementary science lessons. American Educational Research Journal, 7, 477-91.

Yamamoto, K. (1967) Does feeling creatively make a difference in pupil learning? Elementary School Journal, 67, 265-70.

Young, D.B. (1967) The effectiveness of self-instruction in teacher education using modelling and video-tape feedback. Unpublished doctoral thesis. Stanford University (microfilm).

Zahn, R.D. (1967) The use of interaction analysis in supervising student teachers. In Amidon, E.J. and Hough, J.B. (eds.) Interaction Analysis. Reading, Massachusetts: Addison-Wesley Publishing Company, p.295-98.

Zahorik, J.A. (1971) Questioning in the classroom. Education, 91, 358-63.

Zevin, J. (1969) Training teachers in the inquiry method: the effects of an In-service Institute on teacher behavior in the Inner-City classroom. Unpublished doctoral thesis. Ann Arbor: University of Michigan (microfilm).

Zevin, J. (1973) Training teachers in inquiry. Social Education, 38, 310-316.

Bush, R.N. (1973) Curriculum-proof teachers : who does what to whom. In Rubin, L.J. (ed.) Improving In-service Education. Boston : Allyn and Bacon, p.37-70.

Shulman, L.S. and Keislar, E.R. (eds.) (1966) Learning by Discovery : A Critical Appraisal. Chicago : Rand McNally and Co.

Siddiqi, M.N. (1973) A Commentary on 'Determining the level of inquiry in teachers' questions'. Journal of Research in Science Teaching, 10, 179-181.