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ABSTRACT

An evaluation of materials in the sequential anthropology curriculum project with regard to student learning and teacher training is presented. The project sample consisted of 2,183 students in grades 1, 2, 4, and 5. Two forms of the anthropology achievement test were administered as pretest and posttest measures to experimental and control groups of students within each grade. Test results were analyzed to determine differences in anthropology achievement among students by controlling for sex, group identification, and pretest scores. Two conclusions are that students in elementary school can learn the content of the materials presented by the Sequential Anthropology Curriculum Project and that the effect of special training in anthropology for teachers on the achievement of students remains unknown. Eighteen tables showing means and standard deviations of pretest scores and posttest scores and analysis of variance for posttest scores are presented.
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American Educational Research Association, February 16-18, 1967

AN EVALUATION OF THE SEQUENTIAL ANTHROPOLOGY

CURRICULUM PROJECT

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INTRODUCTION

The objectives of the process of evaluation of the Sequential Anthropology Curriculum Project were to determine the effectiveness of the materials developed by the staff of the project in promoting student learning of anthropology and to obtain evidence as to the affect of special training in anthropology for teachers at the various grade levels encompassed by the project.

PROJECT SAMPLE

The students included in the Anthropology Curriculum Project were students in selected schools in Grade 1, Grade 2, Grade 4, and Grade 5. The distribution of the sample by grade level and by group are shown in Table 1.

METHOD

Since there were two forms of achievement tests at each grade level, the sample within each grade level was subdivided into two groups. In the first of the two groups, Form A of the Anthropology Achievement Test was administered as the pretest measure and Form B of the Anthropology Achievement Test was administered as the posttest measure of achievement in anthropology. In the second group at each grade level, Form B of the

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TABLE 1
 DISTRIBUTION OF SAMPLE BY GRADE AND GROUP

Grade		Experimental	Control
1	Male	87	265
	Female	68	224
2	Male	63	219
	Female	55	193
4	Male	72	132
	Female	80	143
5	Male	122	144
	Female	129	187
		676	1507

Anthropology Achievement Test was administered as the pretest measure and Form A of the Anthropology Achievement Test was employed as the posttest measure of achievement. Each subgroup was similarly divided into two groups, one being experimental group and the other labeled as the control group. The distribution of the sample by subgroups and by experimental group and control group is shown in Table 2.

The subgroup labeled AB at each grade level indicates that Form A of the achievement test was administered as the pretest and Form B of the achievement test was administered as the posttest measure. The subgroup labeled BA at each grade level indicates that Form B of the achievement test was employed as the pretest and Form A of the achievement test was administered as the posttest measure of achievement.

A least-squares analysis of variance technique was employed to analyze the posttest scores in each subgroup of each grade level. The covariates examined were sex, group, and pretest scores. The criterion variable was the posttest score on the Anthropology Achievement Test. Interaction effects of group and sex were examined through the use of the Duncan Multiple Range Test. The null hypotheses were rejected when the F-value was equal to or exceeded the F-value required for the 0.05 level of significance.

FINDINGS

Grade 1 - Group AB

The analysis of variance for posttest scores for Grade 1, Group AB is found in Table 3. There were no significant differences in anthropology achievement between the experimental group and the control group. Similarly, there were no significant differences in anthropology achievement attributable

TABLE 2

SAMPLE DISTRIBUTION BY GROUP AND SUBGROUP

		Subgroup A	Subgroup B
Grade 1	<u>Experimental</u>	40	115
	<u>Control</u>	296	193
Grade 2	<u>Experimental</u>	55	63
	<u>Control</u>	195	217
Grade 4	<u>Experimental</u>	55	97
	<u>Control</u>	168	107
Grade 5	<u>Experimental</u>	76	175
	<u>Control</u>	157	174

TABLE 3

ANALYSIS OF VARIANCE FOR POSTTEST SCORES, GROUP AB, FIRST GRADE

(N = 336)

Source	df	Sum of Squares	Mean Squares	F
Total SS	335	3815.33		
Model SS	4	261.84	65.46	6.10 **
Error SS	331	3553.49	10.73	
Sex	1	8.73	8.73	0.81
Group	1	11.51	0.12	0.01
Group X Sex	1	17.76	17.76	1.65
Pretest (Form A)	1	221.81	221.81	20.66 **

** $p \leq 0.01$

to the sex of the student. The only significant relationship revealed by the analysis indicates that the pretest score on Form A was a significant predictor of achievement in anthropology as measured by Form B of the Anthropology Achievement Test ($F = 20.66$; $p \leq 0.01$). The interaction effects of group and sex were not statistically significant.

The means of the pretest scores obtained from Form A of the Anthropology Achievement Test and the means of the posttest score obtained from Form B of the Anthropology Achievement Test by group and by sex are reported in Table 4.

Grade 1 - Group BA

The analysis of variance for posttest scores obtained from Form A of the Anthropology Achievement Test indicates that there were no significant differences in achievement in anthropology between the experimental and control group. There were no significant differences in achievement due to sex. Interaction effects of group and sex did not prove to be statistically significant. Of the variable considered, only the pretest score on Form B of the Anthropology Achievement Test proved to be a significant predictor of achievement in anthropology as measured by the scores obtained from the administration of Form A as the posttest ($F = 84.05$; $p \leq 0.01$). The results of the analysis of variance is found in Table 5.

The means on pretest Form B of the Anthropology Achievement Test and on posttest Form A of the Anthropology Achievement Test are found in Table 6.

Grade 2 - Group AB

The results of the analysis of variance for posttest scores resulting from the administration of Form B of the Anthropology Achievement Test for Grade 2 are found in Table 7. It will be noted that there were no

TABLE 4
MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
POSTTEST SCORES BY GROUP AND SEX, FIRST GRADE, GROUP AB
(N = 336)

	Form A Pretest		Form B Posttest	
	Mean	Standard Deviation	Mean	Standard Deviation
Experimental Group	8.25	2.37	11.00	3.65
Control Group	10.57	2.81	11.23	3.34
Male	10.11	2.67	11.47	3.60
Female	10.51	3.07	11.64	3.14

TABLE 5
ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM A, FIRST GRADE
(N = 308)

Source	df	Sum of Squares	Mean Squares	F
Total SS	307	4317.52		
Model SS	4	986.07	246.52	22.42 **
Error SS	303	3331.45	10.99	0.10
Sex	1	1.07	1.07	2.05
Group	1	22.25	22.25	
Group X Sex	1	1.39	1.39	0.13
Pretest (Form B)	1	924.17	924.17	84.05 **

** $p \leq 0.01$

TABLE 6
MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
POSTTEST SCORES BY GROUP AND SEX, FIRST GRADE, GROUP BA
(N = 308)

	Form B Pretest		Form A Posttest	
	Mean	Standard Deviation	Mean	Standard Deviation
Experimental Group	10.63	2.87	14.11	4.27
Control Group	11.07	2.49	14.98	3.39
Male	11.00	2.71	14.68	3.41
Female	10.79	2.57	14.62	4.17

TABLE 7
 ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM B, SECOND GRADE
 GROUP AB
 (N = 250)

Source	df	Sum of Squares	Mean Squares	F
Total SS	249	4732.40		
Model SS	4	189.64	47.41	2.56 *
Error SS	245	4542.76	18.54	
Sex	1	21.10	21.10	1.14
Group	1	1.29	1.29	0.07
Group X Sex	1	7.02	7.02	0.38
Pretest (Form A)	1	167.55	167.55	9.04 **

* $p \leq 0.05$

** $p \leq 0.01$

significant differences in anthropology achievement between the experimental group and the control group. Likewise, no significant differences are noted due to sex. The interaction effects of group and sex were not statistically significant. The pretest score obtained through the administration of Form A of the Anthropology Achievement Test was the only significant predictor of achievement in anthropology ($F = 9.04$; $p \leq 0.01$).

Means on pretest Form A of the Anthropology Achievement Test and posttest Form B of the Anthropology Achievement Test by group and by sex are found in Table 8.

Grade 2 - Group BA

The analysis of variance of posttest scores obtained from Form A of the Anthropology Achievement Test for Grade 2 reveals no significant differences in achievement in anthropology between the experimental group and the control group. The results of the analysis of variance are found in Table 9.

There were no significant differences in achievement in anthropology between the sexes. Similarly, there were no statistically significant interaction effects of sex and group on achievement in anthropology. The pretest score for Form B of the Anthropology Achievement Test proved to be a significant predictor of achievement in anthropology ($F = 20.47$; $p \leq 0.01$).

The means of scores from pretest Form B and the means of posttest Form A by sex and group are reported in Table 10.

Grade 4 - Group AB

The results of the analysis of variance of posttest scores on Form B, Grade 4, Anthropology Achievement Test are found in Table 11. The difference in achievement in anthropology between the experimental group and the control group was found to be significant in favor of the experimental group

TABLE 8
MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
POSTTEST SCORES BY GROUP AND SEX, SECOND GRADE, GROUP AB
(N =250)

	Form A Pretest		Form B Posttest	
	Mean	Standard Deviation	Mean	Standard Deviation
Experimental Group	11.34	2.26	18.57	3.87
Control Group	10.83	2.69	18.19	4.51
Male	10.91	2.73	18.50	4.53
Female	10.98	2.49	18.05	4.20

TABLE 9
 ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM A, SECOND GRADE
 GROUP BA
 (N = 280)

Source	df	Sum of Squares	Mean Squares	F
Total SS	279	5028.40		
Model SS	4	384.40	96.10	5.69 **
Error SS	275	4643.00	16.89	
Sex	1	12.20	12.20	0.72
Group	1	2.42	2.42	0.14
Group X sex	1	22.81	22.81	1.35
Pretest (Form B)	1	345.66	345.66	20.47 **

** $p \leq 0.01$

TABLE 10
MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
POSTTEST SCORES BY GROUP AND SEX, SECOND GRADE, GROUP BA
(N = 280)

	Form B. Pretest		Form A Posttest	
	Means	Standard Deviation	Means	Standard Deviation
Experimental Group	9.96	2.31	16.80	4.74
Control Group	10.56	2.95	16.86	4.12
Male	10.61	2.83	16.87	4.33
Female	10.20	2.81	16.83	4.20

TABLE 11
ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM B, FOURTH GRADE
(N = 224)

Source	df	Sum of Squares	Mean Squares	F
Total SS	223	7827.93		
Model SS	4	2209.01	552.25	21.52 **
Error SS	219	5618.92	25.66	
Sex	1	18.92	18.92	0.74
Group	1	283.88	283.88	11.06 **
Group X Sex	1	91.23	91.23	3.56
Pretest (Form A)	1	2026.62	2026.62	78.99 **

** $p \leq 0.01$

($F = 11.06$; $p \leq 0.01$). No other statistically significant findings are reported. However, the pretest score on Form A of the Anthropology Achievement Test proved to be a significant predictor of achievement in anthropology as measured by the posttest scores obtained from Form B of the Anthropology Achievement Test ($F = 18.99$; $p \leq 0.01$).

The means of the pretest (Form A) and the means of the posttest (Form B) by sex and group are reported in Table 12.

Grade 4 - Group BA

The analysis of variance of the posttest scores on Form A of the Grade 4 Anthropology Achievement Test reveals no significant differences in achievement in anthropology between the experimental group and the control group. There were no significant differences in achievement in anthropology between the sexes. The interaction effects of sex and group were not statistically significant. Scores attained on Form B of the Grade 4 Anthropology Achievement Test were significant predictors of achievement in anthropology ($F = 55.24$; $p \leq 0.01$). The results of the analysis are found in Table 13.

The means on both pretest and posttest are reported by group and by sex in Table 14.

Grade 5 - Group AB

The results of the analysis of variance of posttest scores for Form B of the Grade 5 Anthropology Achievement Test are found in Table 15. There was a significant difference in achievement in anthropology from pretest to posttest in favor of the experimental group ($F = 4.68$; $p \leq 0.05$). There was no significant difference in achievement in anthropology between the sexes nor was the interaction effects of group and sex statistically

TABLE 12
 MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
 POSTTEST SCORES BY GROUP AND SEX, FOURTH GRADE, GROUP AB
 (N = 224)

	Form A Pretest		Form B Posttest	
	Means	Standard Deviation	Means	Standard Deviation
Experimental Group	11.69	3.08	22.56	5.86
Control Group	12.79	4.15	20.83	5.92
Male	12.46	3.93	21.34	5.61
Female	12.53	3.96	21.18	6.32

TABLE 13
 ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM A, FOURTH GRADE
 (N = 290)

Source	df	Sum of Squares	Mean Squares	F
Total SS	289	7683.30		
Model SS	4	1283.33	320.83	14.29 **
Error SS	285	6399.97	22.46	
Sex	1	0.91	0.91	0.04
Group	1	23.40	23.40	1.04
Group X Sex	1	3.07	3.07	0.14
Pretest (Form B)	1	1240.45	1240.45	55.24 **

** $p < 0.01$

TABLE 14
MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
POSTTEST SCORES BY GROUP AND SEX, FOURTH GRADE, GROUP BA
(N = 290)

	Form B Pretest		Form A Posttest	
	Means	Standard Deviation	Means	Standard Deviation
Experimental Group	11.48	3.28	18.13	4.94
Control Group	12.02	3.55	18.01	5.32
Male	12.34	3.57	18.48	5.35
Female	11.62	3.35	17.74	4.99

TABLE 15
 ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM B, FIFTH GRADE
 (N = 235)

Source	df	Sum of Squares	Mean Squares	F
Total SS	234	9495.42		
Model SS	4	2753.53	688.38	23.48 **
Error SS	230	6741.89	29.31	
Sex	1	31.24	31.24	1.07
Group	1	137.03	137.03	4.68 *
Group X Sex	1	78.78	78.78	2.69
Pretest (Form A)	1	2659.35	2659.35	90.72 **

* $p \leq 0.05$

** $p \leq 0.01$

significant. The pretest scores achieved by students on Form A of the Grade 5 Anthropology Achievement Test proved to be a significant predictor of achievement in anthropology as measured by the posttest score achieved on Form B of the Grade 4 Anthropology Achievement Test ($F = 90.72$; $p \leq 0.01$).

Table 16 reports the means on the pretest and posttest by group and by sex for Grade 5, Group AB.

Grade 5 - Group BA

There was no significant difference in achievement in anthropology for the group in which Form B of the Grade 5 Anthropology Achievement Test was employed as the pretest and Form A of the Grade 5 Anthropology Achievement Test was administered as the posttest measure. Similarly, there was no significant difference in achievement between the sexes. The interaction effects of group and sex were not statistically significant. Scores on the pretest were significant predictors of achievement in anthropology as measured by the posttest ($F = 114.85$; $p \leq 0.01$). The results of the analysis of variance are found in Table 17.

The means of the pretest scores on Form B of the Grade 5 Anthropology Achievement Test and the means of the posttest scores on Form A of the Grade 5 Anthropology Achievement Test by group and by sex are reported in Table 18.

DISCUSSION

The analyses of data for achievement in anthropology by students in Grade 1, Grade 2, Grade 4, and Grade 5 yield ample evidence that students in the elementary grades can and do learn the anthropology content presented to them in the Sequential Anthropology Curriculum Project. There were significant gains in anthropology knowledge at each grade level and by all

TABLE 16
 MEANS AND STANDARD DEVIATIONS OF PRETEST SCORES AND
 POSTTEST SCORES BY GROUP AND SEX, FIFTH GRADE, FORM AB
 (N. =235)

	Form A Pretest		Form B Posttest	
	Mean	Standard Deviation	Mean	Standard Deviation
Experimental Group	18.60	4.10	26.15	5.48
Control Group	19.32	4.27	24.93	6.79
Male	19.16	4.38	25.19	6.65
Female	19.03	4.10	25.43	6.23

TABLE 17

ANALYSIS OF VARIANCE FOR POSTTEST SCORES, FORM A, FIFTH GRADE
(N = 350)

Source	df	Sum of Squares	Mean Squares	F
Total SS	349	13,054.22		
Model SS	4	3,285.65	821.41	29.01 **
Error SS	345	9,768.57	28.31	
Sex	1	11.49	11.49	0.41
Group	1	22.42	22.42	0.79
Group X Sex	1	0.58	0.58	0.02
Pretest (Form B)	1	3,251.94	3,251.94	114.85 **

** $p \leq 0.01$

TABLE 10
 MEANS AND STANDARD DEVIATION OF PRETEST SCORES AND
 POSTTEST SCORES BY GROUP AND SEX, FIFTH GRADE, FORM BA
 (N = 350)

	Form B Pretest		Form A Posttest	
	Means	Standard Deviation	Means	Standard Deviation
Experimental Group	19.03	4.79	24.91	5.83
Control Group	19.15	4.60	24.44	6.44
Male	19.12	4.80	24.90	6.50
Female	19.07	4.63	24.48	5.81

groups. In all but two subgroups (Grade 4, Group AB and Grade 5, Group AB) the gains in achievement were present regardless of whether the student was a member of the experimental group or a control group. Remembering that the difference in treatment between the experimental groups and the control groups were differences in teacher treatment rather than student treatment, the results of the investigation are not surprising. It is impossible to attribute the significant differences reported to differences in teacher training. It is also impossible with the evidence in hand to state unequivocally that the significant differences were not due to the special training received by the teachers of the students in the experimental group. The variables uncontrolled and some unknown make any inference as to the relationship between the training of the teacher, per se, and the achievement of students dangerous.

We would like to be able to substantiate the point that the materials for teachers developed by the staff members of the Sequential Anthropology Project were of such a nature as to make special training in anthropology for teachers unnecessary to the orderly presentation of the discipline. Further, that the combination of teacher materials, student tests, and other learning aids were effective in conveying anthropological concepts is evident from the data presented.

CONCLUSIONS

The following can be concluded from the data gathered and the analyses presented:

1. Students in the elementary school can learn the content of the materials presented by the Sequential Anthropology Curriculum Project.
2. The effect of special training in anthropology for teachers on the achievement of students remains unknown.