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ABSTRACT

The Waterbury Board of Education is currently operating a Manpower Development and Training Act (MDTA) project. It includes the Adult Basic Education Program and Occupational Skill Training. The program provides basic elementary education to individuals functioning at or below the third grade level in arithmetic and English, as well as those who are unable to speak, read, or write the English language. The objective of the project is to train unemployed and underemployed youth and adults who have inadequate skills, to obtain and hold jobs, so they may become productive, functional members of society. The subjects were selected from terminees of the program who had been given the Basic Education Test (BET) upon entry and the Adult Basic Learning Exam (ABLE) during the training period. Analysis of varia[illegible]end analysis were conducted and the results indicate that the program was effective in giving its trainees an increase in educational attainment with a linear trend. (Author/CK)

# AN EVALUATION OF THE OCCUPATIONALLY ORIENTED BASIC EDUCATION PROGRAM IN WATERBURY, CONNECTICUT

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Based on a master thesis in educational research at Southern Connecticut State College. The study was conducted as a part of a graduate program in Educational Research under a Federal Grant provided by the United States Office of Education under Title IV of the Elementary and Secondary Education Act.

The Waterbury Board of Education is currently operating a Manpower Development and Training Act (MDTA) project in the former Croft High School, in Waterbury, Connecticut. The project includes Adult Basic Education and Occupational Skill training. The Adult Basic Education aspect of the project is referred to as Occupationally Oriented Basic Education (OOBE). The OOBE program provides basic elementary education to individuals functioning at or below the third grade level in arithmetic and English, as well as those who are unable to speak, read, or write the English language. The OOBE training includes: Communication Skills, Computation Skills, Community Living, Manipulative Skills. The purpose of the project is to train unemployed and underemployed youth and adults who have inadequate skills, to obtain and hold jobs, so they may become productive, functional, members of society.

Since the public has the right to be informed of the relative success of programs to which it supplies funds, and the MDTA OOBE program is supported by public monies, it must of necessity be evaluated. This evaluation must be made on testable foundations. The MDTA OOBE program has as one of its goals the proposition that the trainees are actually obtaining the education for which they are being trained. To evaluate this proposition, two hypotheses were presented.

1. If a group is given MDTA OOBE training it will then show a continuous gain in educational attainment in Reading, Spelling, Vocabulary, Computation, Problem Solving and Total Arithmetic abilities during the training period.

2. If a group is given MDTA OOBE training it will show a linear trend in learning ability during the training period.

The subjects were selected from termineas of the MDTA OOBE program who had been given the Basic Education Test (BET) upon entry and the Adult Basic Learning Exam (ABLE) during the training period. The subjects were divided into three groups of 31 each. Randomization was used as much as feasible when assigning the subjects to groups. Groups I, II, and III were tested with the ABLE an average of 37.4, 137.2, and 223.5 days after the BET was administered. The design used was a multi-group design, with three groups, which was quasi-experimental in nature because full randomization was not possible.

To test the first hypotheses analysis of covariance was employed to determine if there were significant differences on the ABLE subtest scores for, Vocabulary, Reading, Spelling, Computation, Problem Solving, and Total Arithmetic, using the BET subtest scores for Word Meaning, Reading, Arithmetic, Word Meaning plus Reading plus Arithmetic, and Arithmetic as the respective concomitant variables. Hypothesis 1 was accepted for all except Problem Solving using an $\alpha = .01$ level of significance.

To test Hypothesis 2 trend analysis was employed using the adjusted means of the corresponding analysis of covariances. Hypothesis 2 was accepted for all subtests except Problem Solving using an $\alpha = .01$ level of significance. The problem Solving subtest means showed a quadratic trend significant at the $\alpha = .05$ level.

Because of the preponderance of positive results, the program was evaluated as effective in giving its trainees an increase in educational attainment as measured by the ABLE. Also, the trainees tested showed a linear trend in the ability to learn those factors tested by the ABLE. Therefore the longer a trainee would have been given training, the greater would have been his educational attainment.

SFK/SJB:led

TABLE: 1

ANALYSIS OF COVARIANCE - VOCABULARY

| Source of Variation | Sum of Squares: X | Sum of Squares: Y | Sum of Products | d.f. | Adjusted Sum of Squares: Y | d.f | Mean Sum of Squares: Y | F |
|---|---|---|---|---|---|---|---|---|
| Treatment | 4.129 | 1291.807 | -73.032 | 2 | 1481.859 | 2 | 740.930 | 8.990 * |
| Errors | 819.161 | 8728.774 | 1068.355 | 90 | 7335.419 | 89 | 82.420 | |
| Total | 823.290 | 10020.581 | 995.323 | 92 | 8817.279 | 91 | | |

* $p < 0.01$

Test of Homogeneity of the Regression Coefficients

$F(2,87) = 0.768$ $p > 0.01$ The slopes are not significantly different, therefore the lines are assumed to be parallel.

Adjusted Means

$\bar{Y}'_{1.} = 23.276$

$\bar{Y}'_{2.} = 28.129$

$\bar{Y}'_{3.} = 33.079$

TABLE: 2

TREND ANALYSIS USING
ORTHOGONAL POLYNOMIALS:
VOCABULARY

| Source of Variation | Sum of Squares | d.f. | Mean Sum of Squares | F |
|---|---|---|---|---|
| Linear regression | 1399.779 | 1 | 1399.779 | 16.984* |
| Quadratic regression | 82.080 | 1 | 82.080 | .996 |
| Errors | 7335.419 | 89 | 82.420 | |
| Total | 8817.279 | 91 | | |

* $p < 0.01$

Adjusted Totals

$T_1' = 720.556$

$T_2' = 972.099$

$T_3' = 1015.002$

TABLE: 3

## ANALYSIS OF COVARIANCE - READING

| Source of Variation | Sum of Squares: X | Sum of Squares: Y | Sum of Products | d.f. | Adjusted Sum of Squares: Y | d.f. | Mean Sum of Squares: Y | F. |
|---|---|---|---|---|---|---|---|---|
| Treatment | 2.860 | 1415.510 | 22.634 | 2 | 1314.651 | 2 | 657.325 | 7.799* |
| Errors | 237.097 | 9168.320 | 628.613 | 90 | 7501.683 | 89 | 84.289 | |
| Total | 239.957 | 10583.830 | 651.247 | 92 | 8816.334 | 91 | | |

*$p < 0.01$

Test of Homogeneity of the Regression Coefficients

$F(2,87)=1.730 \quad p > 0.01$ The slopes are not significantly different, therefore the lines are assumed to be parallel.

Adjusted Means

$\bar{Y}'_{1.} = 30.629$

$\bar{Y}'_{2.} = 36.538$

$\bar{Y}'_{3.} = 39.704$

TABLE: 4

TREND ANALYSIS USING
ORTHOGONAL POLYNOMIALS:

READING

| Source of Variation | Sum of Squares | d.f. | Mean Sum of Squares | F |
|---|---|---|---|---|
| Linear regression | 1276.512 | 1 | 1276.512 | 15.144* |
| Quadratic regression | 38.139 | 1 | 38.139 | .452 |
| Errors | 7501.683 | 89 | 84.289 | |
| Total | 8816.334 | 91 | | |

*$p < 0.01$

Adjusted Totals

$T_1' = 949.499$

$T_2' = 1132.678$

$T_3' = 1230.824$

TABLE: 5

ANALYSIS OF COVARIANCE - SPELLING

| Source of Variation | Sum of Squares: X | Sum of Squares: Y | Sum of Products | d.f. | Adjusted Sum of Squares: Y | d.f. | Mean Sum of Squares: Y | F |
|---|---|---|---|---|---|---|---|---|
| Treatment | 2.860 | 761.053 | 5.602 | 2 | 750.376 | 2 | 375.188 | 7.556* |
| Errors | 237.097 | 5052.775 | 387.645 | 90 | 4418.989 | 89 | 49.652 | |
| Total | 239.957 | 5813.828 | 393.247 | 92 | 5169.365 | 91 | | |

*p < 0.01

Test of Homogeneity of the Regression Coefficients

F(2,87)=0.848 p > 0.01 The slopes are not significantly different, therefore the lines are assumed to be parallel.

Adjusted Means:

$\bar{Y}'_{1.} = 16.261$

$\bar{Y}'_{2.} = 19.402$

$\bar{Y}'_{3.} = 23.208$

TABLE: 6

TREND ANALYSIS USING
ORTHOGONAL POLYNOMIALS:
SPELLING

| Source of Variation | Sum of Squares | d.f. | Mean Sum of Squares | F |
|---|---|---|---|---|
| Linear regression | 748.043 | 1 | 748.043 | 15.065 * |
| Quadratic regression | 2.333 | 1 | 2.333 | 0.047 |
| Errors | 4418.989 | 89 | 49.652 | |
| Total | 5169.365 | 91 | | |

*$p < 0.01$

Adjusted Totals

$T_1' = 504.091$

$T_2' = 601.462$

$T_3' = 719.448$

TABLE: 7

## ANALYSIS OF COVARIANCE - COMPUTATION

| Source of Variation | Sum of Squares: X | Sum of Squares: Y | Sum of Products | d.f. | Adjusted Sum of Squares: Y | d.f. | Mean Sum of Squares: Y | F |
|---|---|---|---|---|---|---|---|---|
| Treatment | 239.053 | 805.506 | 147.011 | 2 | 715.579 | 2 | 357.790 | 14.289* |
| Errors | 4129.420 | 4033.290 | 2730.000 | 90 | 2228.460 | 89 | 25.039 | |
| Total | 4368.473 | 4838.796 | 2877.011 | 92 | 2944.040 | 91 | | |

*p < 0.01

Test of Homogeneity of the Regression Coefficients

F(2,87)=0.080 p > 0.01. The slopes are not significantly different, therefore the lines are assumed to be parallel.

Adjusted Means

$\bar{Y}'_{1.} = 20.055$

$\bar{Y}'_{2.} = 24.511$

$\bar{Y}'_{3.} = 26.725$

TABLE: 8

TREND ANALYSIS USING
ORTHOGONAL POLYNOMIALS:
COMPUTATION

| Source of Variation | Sum of Squares | d.f. | Mean Sum of Squares | F |
|---|---|---|---|---|
| Linear regression | 689.610 | 1 | 689.610 | 27.541* |
| Quadratic regression | 25.969 | 1 | 25.969 | 1.037 |
| Errors | 2228.460 | 89 | 25.039 | |
| Total | 2944.040 | 91 | | |

*$p < 0.01$

Adjusted Totals

$T_1' = 621.705$

$T_2' = 769.841$

$T_3' = 828.475$

TABLE: 9

ANALYSIS OF COVARIANCE - PROBLEM SOLVING

| Source of Variation | Sum of Squares: X | Sum of Squares: Y | Sum of Products | d.f. | Adjusted Sum of Squares: Y | d.f. | Mean Sum of Squares: Y | F |
|---|---|---|---|---|---|---|---|---|
| Treatment | 120.667 | 238.344 | 51.720 | 2 | 216.179 | 2 | 108.090 | 3.443* |
| Errors | 5848.516 | 3895.548 | 2538.323 | 90 | 2793.887 | 89 | 31.392 | |
| Total | 5969.183 | 4133.892 | 2590.043 | 92 | 3010.066 | 91 | | |

*$p < 0.05$

Test of Homogeneity of the Regression Coefficients

$F(2,87)=1.697 \quad p>0.01$

The slopes are not significantly different, therefore the lines are assumed to be parallel.

Adjusted Means

$Y'_{1.} = 9.877$

$Y'_{2.} = 12.082$

$Y'_{3.} = 13.589$

TABLE: 10

TREND ANALYSIS USING
ORTHOGONAL POLYNOMIALS:
PROBLEM SOLVING

| Source of Variation | Sum of Squares | d.f. | Mean Sum of Squares | F |
|---|---|---|---|---|
| Linear regression | 27.731 | 1 | 27.731 | 0.883 |
| Quadratic regression | 188.448 | 1 | 188.448 | 6.003* |
| Errors | 2793.887 | 89 | 31.392 | |
| Total | 3010.066 | 91 | | |

*$p < 0.05$

Adjusted Totals

$T_1' = 306.187$

$T_2' = 374.542$

$T_3' = 420.259$

TABLE: 11

ANALYSIS OF COVARIANCE - TOTAL ARITHMETIC

| Source of Variation | Sum of Squares: X | Sum of Squares: Y | Sum of Products | d.f. | Adjusted Sum of Squares: Y | d.f. | Mean Sum of Squares: Y | F |
|---|---|---|---|---|---|---|---|---|
| Treatment | 239.053 | 1919.800 | 233.483 | 2 | 1699.729 | 2 | 849.865 | 9.361* |
| Errors | 4129.420 | 13680.260 | 4808.807 | 90 | 8080.291 | 89 | 90.790 | |
| Total | 4368.473 | 15600.060 | 5042.290 | 92 | 9780.020 | 91 | | |

*p < 0.01

Test of Homogeneity of the Regression Coefficients

F(2,87)= 0.927 p > 0.01 The slopes are not significantly different, therefore the lines are assumed to be parallel.

Adjusted Means

$\bar{Y}'_{1.}$ = 29.815

$\bar{Y}'_{2.}$ = 37.024

$\bar{Y}'_{3.}$ = 40.000

TABLE: 12

TREND ANALYSIS USING
ORTHOGONAL POLYNOMIAL:
TOTAL ARITHMETIC

| Source of Variation | Sum of Squares | d.f. | Mean Sum of Squares | F |
|---|---|---|---|---|
| Linear regression | 1607.880 | 1 | 1607.880 | 17.709** |
| Quadratic regression | 91.849 | 1 | 91.849 | 1.012 |
| Errors | 8080.291 | 89 | 90.790 | |
| Total | 9780.020 | 91 | | |

*p < 0.01

Adjusted Totals

$T_1' = 924.265$

$T_2' = 1147.744$

$T_3' = 1240.000$