Federation of Neighborhood Centers
Green Job Readiness Partnership
Analysis of Literacy Gains

This report presents the analysis of literacy gains for participants in the Federation of Neighborhood Centers' Green Job Readiness Partnership training program over at two-year period from January 2010 to December 2011. Data describing initial, middle and final Test of Adult Basic Education (TABE) scores for Reading Comprehension, Computational Math and Applied Math were used in this analysis.

Program Design and Goals

The Green Job Readiness Partnership offered 93 adults, in 8 cohorts, literacy instruction contextualized for clean energy and green construction careers, with the goal of preparing them for further skills training and employment.   The program offered nine weeks of training, 9:00 a.m. – 4:00 p.m. each weekday. Of this, a total of 171 hours were spent in classroom-based literacy training (19 hours/week), with the majority (13 hours/week) focused on increasing math skills and the balance (6 hours/week) focused on reading, problem solving and critical thinking skills, through a customized curriculum integrating energy science and construction math. Participants then applied these skills through hands-on construction simulations (5 hours/week), life skills and job readiness activities (6 hours/week).

Since many green job training programs and job tasks require reading and math skills between the 8th-10th grade level, the program sought to increase literacy scores of participants by 2 grade levels and/or increase literacy scores above the 8th grade level for those who scored below that and/or above the 10th grade level for those who scored below that.

Analysis

93 participants, divided into 8 cohorts received literacy instruction contextualized for clean energy and green construction careers. 4 (four) withdrew from the program. The remaining 89 participants represented a mix of adults with varying literacy scores. Some had low initial scores in both reading and math, while others had low math scores and higher reading scores or lower reading scores and higher math scores. For the purposes of this analysis, participants were categorized by those who had a goal to improve Reading Comprehension scores (63 adults), Computational Math scores (77 adults), and/or Applied Math scores (61 adults). Students were served in 8 cohorts and where possible we show the results by cohort.

The following analysis was performed:

- We calculated the percentage of adults scoring above the 10th grade level in in Reading Comprehension, Computational Math, and Applied Math at pretest and posttest scores.
- We calculated the percentage of adults with increases of 2 or more grade levels in in Reading Comprehension, Computational Math, and Applied Math.
- We conducted a paired-samples t-test for difference in mean scores between pretest and posttest scores in Reading Comprehension, Computational Math, and Applied Math. Adults were tested as a whole group as the analysis by cohort cannot be executed due to a small sample size.

Findings

- The percentage of individuals scoring above 10th grade level increased in all tests and all cohorts. Specifically, across all adults, 24 percent more adults scored above 10th grade level in Reading Comprehension, 56 percent more adults in Computational Math, and 39 percent more adults in Applied Math (Figures 2 to 5).
- 65 percent of adults increased their literacy levels by two grade levels or more or reached the highest literacy mark in Reading Comprehension, 74 percent of adults in Computational Math, and 74 percent of adults in Applied Math (Figures 6 and 7).
- Average increase in scores from pretest to posttest was 2.08 grade levels for Reading Comprehension; 3.17 for Computational Math; and 2.62 for Applied Math (Figure 9).

Figure 1

NUMBER OF ADULTS ABOVE 10TH GRADE LEVEL IN READING COMPREHENSION, COMPUTATIONAL MATH AND APPLIED MATH

	Reading		Computational Math		Applied Math	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Cohort 1	4 of 10	7 of 10	0 of 11	5 of 11	2 of 9	7 of 9
Cohort 2	4 of 12	9 of 12	1 of 15	12 of 15	4 of 10	10 of 10
Cohort 3	4 of 5	5 of 5	0 of 7	4 of 7	3 of 4	3 of 4
Cohort 4	4 of 9	7 of 9	1 of 12	8 of 12	4 of 11	8 of 11
Cohort 5	0 of 6	2 of 6	0 of 8	4 of 8	0 of 7	3 of 7
Cohort 6	5 of 9	3 of 9	1 of 9	4 of 9	5 of 9	7 of 9
Cohort 7	3 of 5	4 of 5	0 of 7	5 of 7	3 of 5	4 of 5
Cohort 8	4 of 7	6 of 7	0 of 8	4 of 8	2 of 6	5 of 6
All Cohorts	**28 of 63**	**43 of 63**	**3 of 77**	**46 of 77**	**23 of 61**	**47 of 61**

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
*Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category.

Figure 2

PERCENTAGE OF ADULTS ABOVE 10TH GRADE LEVEL IN READING COMPREHENSION, COMPUTATIONAL MATH AND APPLIED MATH AT PRETEST AND POSTTEST
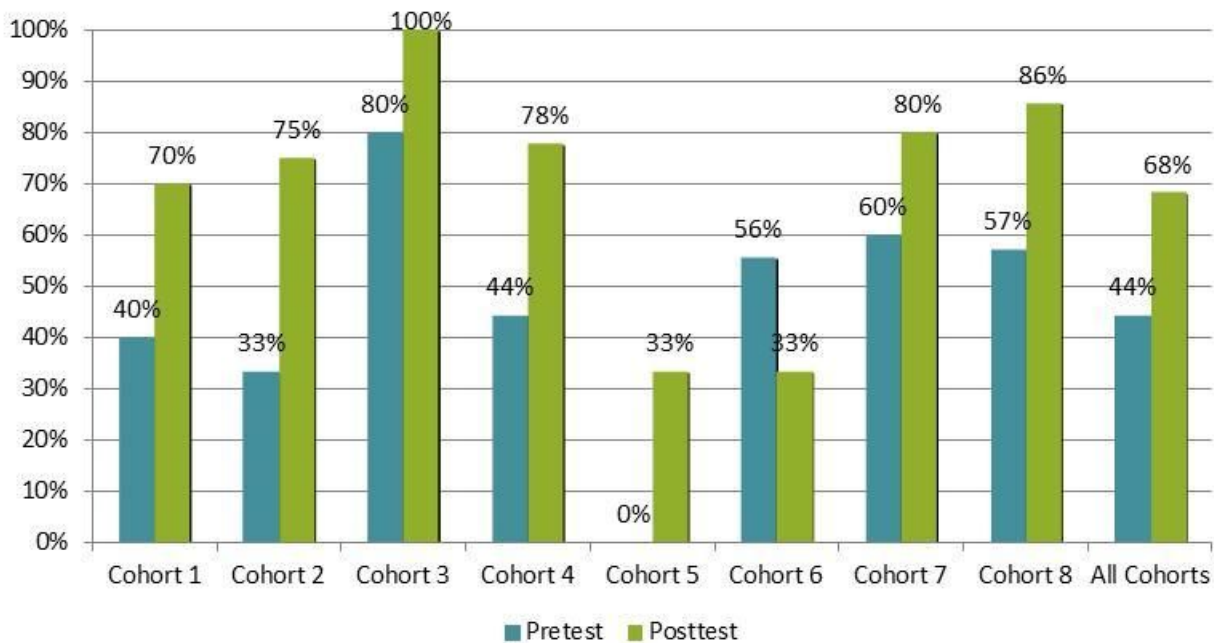
	Reading		Computational Math		Applied Math	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Cohort 1	40%	70%	0%	45%	22%	78%
Cohort 2	33%	75%	7%	80%	40%	100%
Cohort 3	80%	100%	0%	57%	75%	75%
Cohort 4	44%	78%	8%	67%	36%	73%
Cohort 5	0%	33%	0%	50%	0%	43%
Cohort 6	56%	33%	11%	44%	56%	78%
Cohort 7	60%	80%	0%	71%	60%	80%
Cohort 8	57%	86%	0%	50%	33%	83%
All Cohorts	44%	68%	4%	60%	38%	77%

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
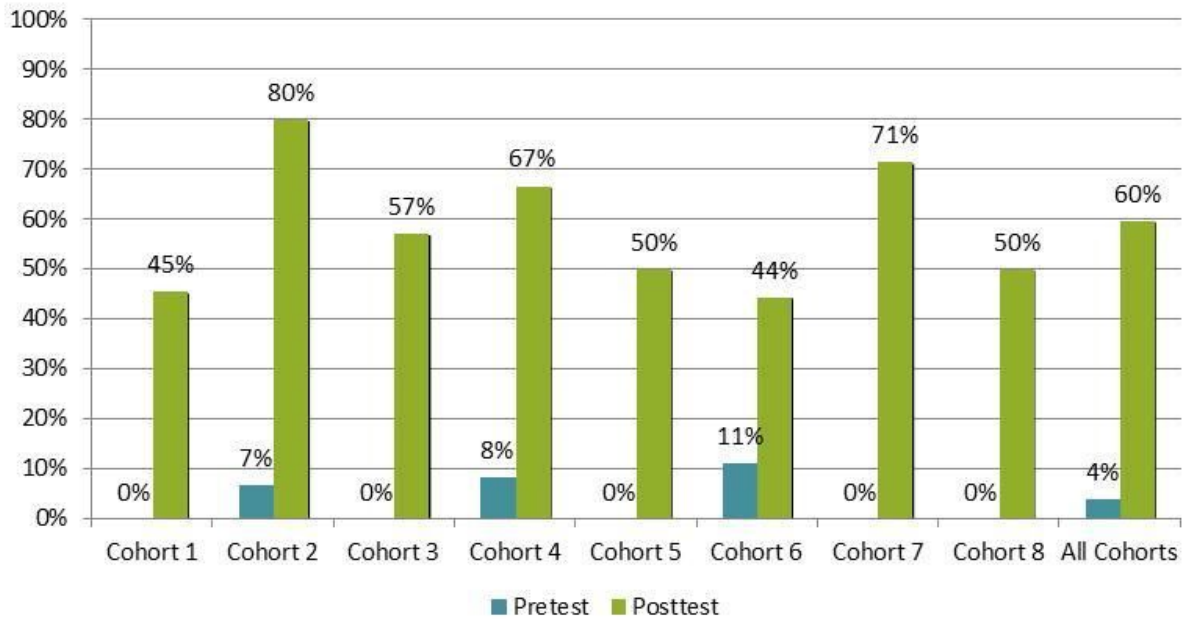**Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category. The share of adults who scored above 10th grade level in Reading at the posttest compared to the pretest in Cohort 6 decreased. This may be due to pretest-posttest bias or other factors that skewed the testing results.*

Figure 3

PERCENTAGE OF ADULTS ABOVE 10TH GRADE LEVEL IN READING COMPREHENSION AT PRETEST AND POSTTEST

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
*Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category. The share of adults who scored above 10th grade level

in Reading at the posttest compared to the pretest in Cohort 6 decreased. This may be due to pretest-posttest bias or other factors that skewed the testing results.

Figure 4

PERCENTAGE OF ADULTS ABOVE 10TH GRADE LEVEL IN COMPUTATIONAL MATH AT PRETEST AND POSTTEST
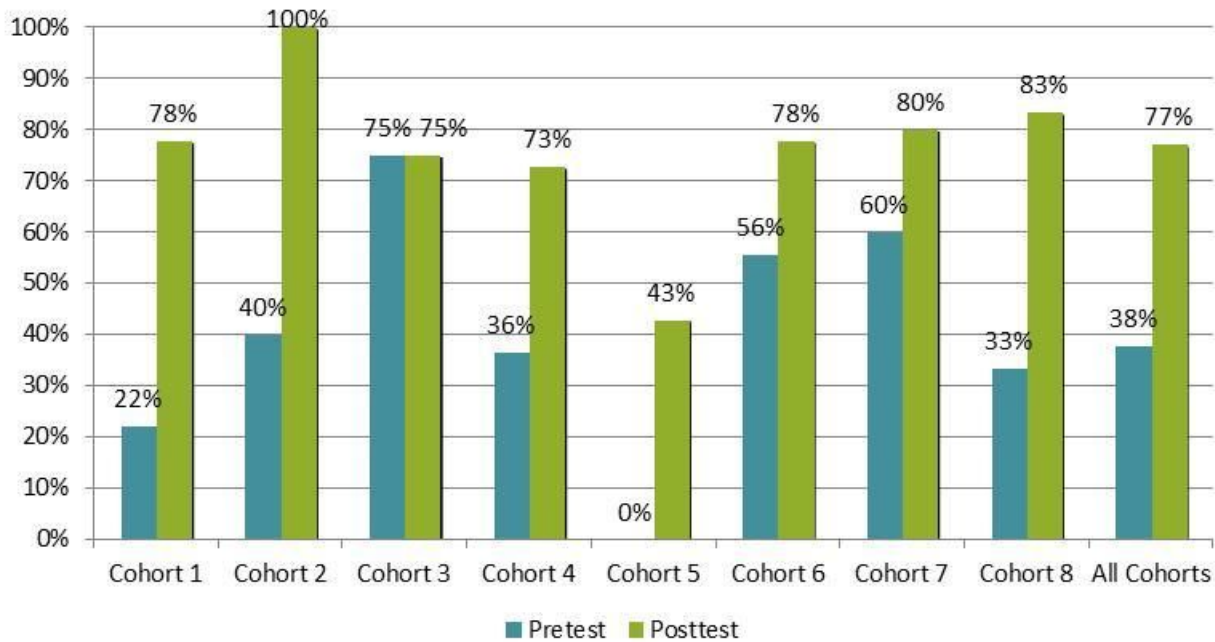

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
*Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category.

Figure 5

PERCENTAGE OF ADULTS ABOVE 10TH GRADE LEVEL IN APPLIED MATH AT PRETEST AND POSTTEST

*Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012. *Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category.*

Figure 6

ADULTS WITH GAINS OF TWO OR MORE GRADE LEVELS FROM PRETEST TO POSTTEST IN READING COMPREHENSION, COMPUTATIONAL MATH AND APPLIED MATH

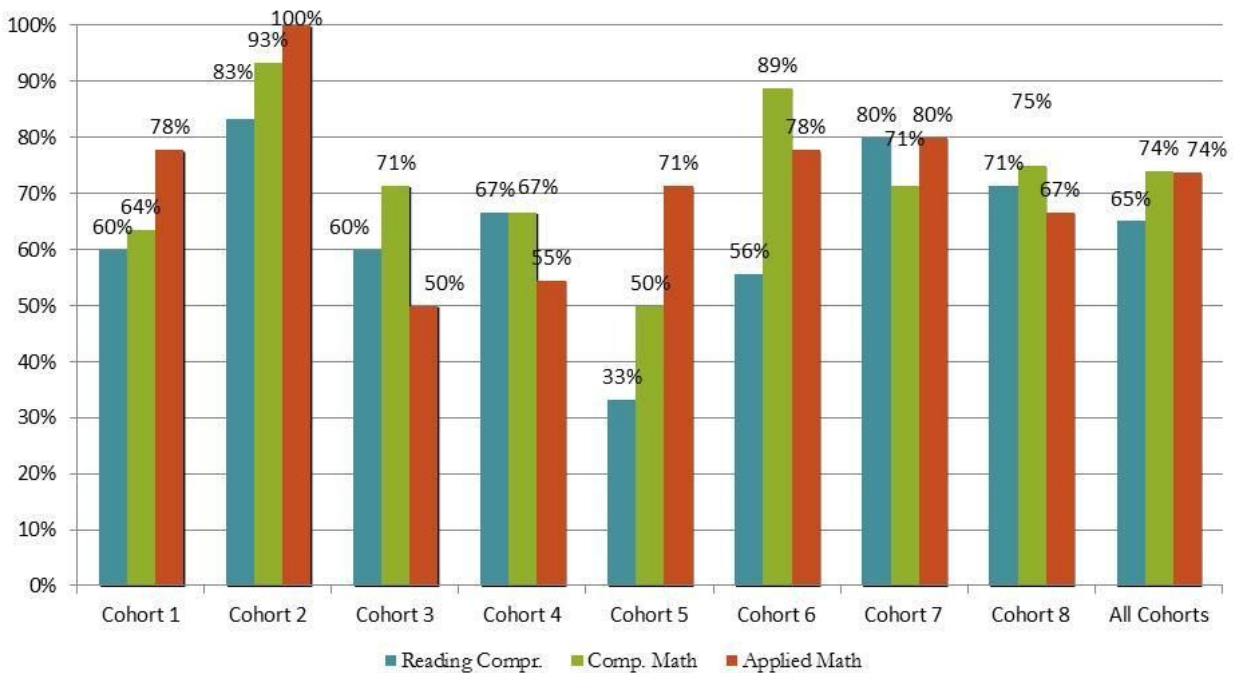|	Reading Comprehension		Computational Math		Applied Math	
	Count	Percent	Count	Percent	Count	Percent
Cohort 1	6 of 10	60%	7 of 11	64%	7 of 9	78%
Cohort 2	10 of 12	83%	14 of 15	93%	10 of 10	100%
Cohort 3	3 of 5	60%	5 of 7	71%	2 of 4	50%
Cohort 4	6 of 9	67%	8 of 12	67%	6 of 11	55%
Cohort 5	2 of 6	33%	4 of 8	50%	5 of 7	71%
Cohort 6	5 of 9	56%	8 of 9	89%	7 of 9	78%
Cohort 7	4 of 5	80%	5 of 7	71%	4 of 5	80%
Cohort 8	5 of 7	71%	6 of 8	75%	4 of 6	67%
All Cohorts	41 of 63	65%	57 of 77	74%	45 of 61	74%

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category. Adults that achieved the highest score of 12.9 at posttest and had registered gains between 1.7 and 1.8 grade levels were counted as if they achieved 2 grade levels (their real achievement cannot be quantified as the scale ends at 12.9).

Figure 7

PERCENTAGE OF ADULTS WITH GAINS OF TWO OR MORE GRADE LEVELS FROM PRETEST TO POSTTEST IN READING COMPREHENSION, COMPUTATIONAL MATH AND APPLIED MATH

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
Note: only adults who had a goal to increase Reading Comprehension (n=63), Computational Math (n=77), or Applied Math (n=61) scores were counted in each category

Quantifying Literacy Gains

A paired sample t-test was conducted to evaluate the impact of literacy instruction on adults' Reading Comprehension, Computational Math and Applied Math scores on TABE. There was a statistically significant increase in scores from pretest to posttest for all three tests. The highest increases were observed in Computational Math tests. Mean increase for Reading Comprehension was 2.08 grade levels; 3.17 for Computational Math; and 2.62 for Applied Math. Increases in scores are statistically significant and can be attributed to literacy instruction. All statistics are presented in the table above.

Figure 8

PAIRED SAMPLE T-TEST STATISTICS

	Mean	N	Std. Deviation	Std. Error Mean
Reading Comprehension Posttest	10.72	63	2.14	0.27
Reading Comprehension Pretest	8.64	63	2.34	0.29
Computational Math Posttest	10.37	77	2.33	0.26
Computational Math Pretest	7.19	77	1.93	0.22
Applied Math Posttest	10.99	61	2.34	0.30
Applied Math Pretest	8.37	61	2.39	0.31

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
Figure 9

PAIRED SAMPLE T-TEST STATISTICS, CONT.

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Lower	Upper	t	df	Sig. (2-tailed)
Reading Comprehension Posttest - Reading	2.08	1.84	0.23	1.62	2.55	8.967	62	.000
Computational Math Posttest - Computational Math Pretest	3.17	1.93	0.22	2.74	3.61	14.448	76	.000
Applied Math Posttest - Applied Math Pretest	2.62	2.66	0.34	1.94	3.30	7.683	60	.000

Source: Philadelphia Works' analysis of FNC TABE scores data, updated on September 27, 2012
Paired Sample T-Test Statistics

Notes on Data

Several participants enrolled in literacy instruction scored at the highest level during the initial assessments in Reading Comprehension, Computational Math, or Applied Math. We excluded such participants from the analysis of literacy scores by subject, reasoning that those who scored at the highest level in Reading Comprehension (12.9 grade level) scored much lower at the Computational or Applied Math and became enrolled in literacy to improve their math scores. We applied the same reasoning to students who scored at the highest level on the Computational Math or Applied Math tests, considering those participants as having a primary goal to work on improving Reading Comprehension scores. This does not mean that participants enrolled in literacy instruction on the subject where they scored at the highest levels did not make gains; we just cannot measure those gains because the test scale does not allow us to do so.