

4-10-2002

## Net Economic Outcomes from Community College and Private Vocational School Attendance in Washington State

Kevin Hollenbeck

*W.E. Upjohn Institute for Employment Research*, [hollenbeck@upjohn.org](mailto:hollenbeck@upjohn.org)

Follow this and additional works at: <https://research.upjohn.org/confpapers>

---

### Citation

Hollenbeck, Kevin. 2002. "Net Economic Outcomes from Community College and Private Vocational School Attendance in Washington State." Presented at National Assessment of Vocational Education (NAVE) Research Conference, April 10.

<https://research.upjohn.org/confpapers/34>

This title is brought to you by the Upjohn Institute. For more information, please contact [repository@upjohn.org](mailto:repository@upjohn.org).

# Net Economic Outcomes from Community College and Private Vocational School Attendance in Washington State

April 10, 2002

Kevin Hollenbeck  
W.E. Upjohn Institute for Employment Research

Note: All results presented here are *preliminary*. Do not quote without permission of author and Washington State Education and Training Coordinating Board.

# Outline

---

I. Introduction

II. Nonexperimental Estimation

III. Results

INSERT WORKFORCE TRAINING RESULTS COVER HERE

**Figure 1**  
**Summary of WA Project, Approximate Sample Sizes**  
**by Program and Year**

---

<u>Program</u>	<u>97/98</u>	<u>99/00</u>
JTPA II-A Adults	3,303	2,508
JTPA II	4,565	4,045
JTPA II-C Youth	2,403	1,676
CC Job Prep	19,063	16,742
CC Worker Retraining	3,317	6,894
CC ABE	11,000	13,108
Private Career School	--	10,992
Apprenticeship	3,212	3,198
Secondary Voc/Tech	6,000	11,000
<u>Comparison Group Pools</u>		
ES Labor Exchange Registrants	113,457	234,865
H.S. Exiters	20,000	25,000

## Figure 2

# Summary of WA Project, Variables

---

### Pre-exit year data

- Administrative data with demographic information
- Wage record data back to 90s (including OR, AK, ID)
- Higher education data back to early 90s
- UI benefit data
- TANF/Food Stamps/Medicaid data

### Exit year program data

- (Most recent) training service received
- Institution characteristics

### Outcome data

- Earnings
- Employment
- Hourly wage
- UI receipts/benefits
- TANF/FS/Medicaid receipt/benefits
- Higher education enrollment

## Figure 3

### Assumptions and Notation

---

Assume:

$$Y_{it} = f(X_i | D_i) + g(D_i) + e_{it}$$

$Y_{it}$  = outcome for individual  $i$  in time  $t$

$X_{it}$  = covariates related to  $Y_{it}$  — it may be time-varying or time invariant

$D_i = 1$  if “treatment”; 0 otherwise

$e_{it}$  = error term

$t' < t_l < t$ , where  $t_l$  = “treatment” period

## Figure 4

### Nonexperimental Data

---

#### Potential Problems

1. (selection on observables)  $D \not\perp X$
2. (selection on unobservables)  $E(e_{it} - e_{jt}) \neq 0$   
 $i \ni D_i = 1; \quad j \ni D_j = 0$
3. (non-overlapping support)  $S(X|D_i = 1) \cap S(X|D_i = 0) = \emptyset$



## Figure 5

### Estimation Approaches

---

1. Assume randomization and use difference in means
2. Regression-adjusted difference in means, net impact estimator =  $\hat{C}$

$$\hat{Y}_t = \hat{a} + \hat{\beta}X_t + \hat{c}D$$

3. Difference-in-differences estimator  $m$

$$m = \left( \overline{Y_{it}} - \overline{Y_{it'}} \right) - \left( \overline{Y_{jt}} - \overline{Y_{jt'}} \right)$$

where  $i \ni D_i = 1$  and  $j \ni D_j = 0$

4. Matching

## Figure 6

### Matching Algorithms

---

#### Notation

$C(X_i)$  is neighborhood of  $X_i$ ,  $i \in I_1$

Matched observation for  $i = A_i \ni \{j \in I_0 \mid X_j \in C(X_i)\}$

#### Algorithms

1. # of comparison observations: 1-1 or 1-many
2. With or without replacement
3. Nearest neighbor or caliper (radii)

Nearest Neighbor       $C(X_i) = \min_j \|X_i\|, j \in I_0$

$W_{N_0, N_1}(i, j) = 1$  if  $j \in A_i$ ; 0 otherwise

Caliper (radii) variant       $C(X_i) = \{X_j \mid \|X_i - X_j\| < \varepsilon\}, j \in I_0$

-- if no  $j$ ; then  $A_i = 0$

-- Can use nearest neighbor within radii

## Figure 6 (continued) Propensity Score Matching

---

Substitute  $P(D_i = 1 | X_i)$  for  $X_i$  in matching algorithms.

In practice  $P(D_i = 1 | X_i)$  estimated with logit and

use  $\hat{P}(D_i = 1 | X_i)$ .

## **Results**

## Postsecondary Vocational Education, Long-Term Impacts

---

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$3,600	+(25 – 30%)	+(30 – 45%)
Employment	.70	+(11 – 14%)	+(14 – 20%)
Hours	300	+16%	+(25 – 35%)
Hourly Wage	\$11.20	+14%	+(12 – 20%)

Detailed Results in Appendix 1.

\* Percent of mean level.

## Postsecondary Vocational Education, Short-Term Impacts

---

---

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$4,100	+(22 – 31%)	+(27 – 39%)
Employment	.75	+(9 – 11%)	+(16 – 19%)
Hours	330	+12%	+(25 – 29%)
Hourly Wage	\$12.00	+18%	+(20 – 24%)

---

Detailed results in Appendix 2.

\* Percent of mean level.

## **Worker Retraining, Long-Term Impacts**

---

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$3,800	+(5 – 7%)	+(0 – 14%)
Employment	.70	+7%	–4% – +10%
Hours	320	+(10 – 14%)	+(0 – 15%)
Hourly Wage	\$11.50	0%	–(3 – 6%)

Detailed results in Appendix 3.

\* Percent of mean level.

## **Worker Retraining, Short-Term Impacts**

---

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$4,000	+(5 – 11%)	+(0 – 14%)
Employment	.73	+14%	+(0 – 10%)
Hours	320	+9%	+(0 – 13%)
Hourly Wage	\$12.00	+3%	–(0 – 4%)

---

Detailed results in Appendix 4.

\* Percent of mean level.



## **ABE in Community Colleges, Long-Term Impacts**

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$2,100	-(0 – 10%)	+(0 – 6%)
Employment	.55	0%	+(9 – 22%)
Hours	240	+7%	+(5 – 25%)
Hourly Wage	\$8.50	0%	+3%

Detailed results in Appendix 5.

\* Percent of mean level.

## **ABE in Community Colleges, Short-Term Impacts**

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$1,900	-(15 – 25%)	+(0 – 50%)
Employment	.56	-(13 – 18%)	+(7 – 27%)
Hours	230	-15%	+(0 – 30%)
Hourly Wage	\$8.15	-9%	-5% – +4%

Detailed results in Appendix 6.

\* Percent of mean level.

## **Private Postsecondary Career Schools, Short-Term Impacts**

Impact	Mean	Levels	Trends (Diff-in-Diff)*
Quarterly Earnings	\$2,800	+(0 – 8%)	+(12 – 30%)
Employment	.65	+(0 – 5%)	+(9 – 15%)
Hours	260	0%	+(12 – 24%)
Hourly Wage	\$10.00	0%	+(0 – 6%)

Detailed results in Appendix 7.

\* Percent of mean level.