

## Economic Effects of Adult Education in Utah

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January, 2012

The effects of adult basic education in relation to labor market performance have been widely studied. A consensus among researchers typically finds that adults who participate in educational programs enhance their earnings and increase their job prospects. On average GED or high school diploma recipients typically earn 11% more than high school dropouts and these recipients are 6% more likely to be employed full time than high school dropouts.<sup>1</sup> Using Utah 2010 data, GED recipients earned 16.9% more than high school dropouts and high school graduates earned 24.4% more.<sup>2</sup> In Utah, high school diploma recipients had an unemployment rate 3.54 percentage points lower than adults with less than a high school diploma in 2010.<sup>3</sup> Adults who earn their GED or high school equivalency diplomas do as well in the labor market as traditional high school graduates.<sup>4</sup> Additional research has demonstrated that adult learners are less likely to require medical attention, more likely to be engaged with their children in school, and less likely to require public assistance in comparison to high school dropouts.<sup>5</sup> Adult learners are more engaged in the labor market, participating at a rate that is substantially higher than high school dropouts.<sup>6</sup> The labor force participation rate

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<sup>1</sup> "Educational and Labor Market Performance of GED Recipients - February 1998," US. Department of Education. American Community Survey, PUMS Data, Utah, 2010.

<sup>2</sup> American Community Survey, PUMS Data, Utah, 2010.

<sup>3</sup> American Community Survey, PUMS Data, Utah, 2010.

<sup>4</sup> "A comparison of the performance of adult high school diploma program students with graduating seniors in three areas of basic skill development." ERIC Document Reproduction Service No. ED 145 085.

<sup>5</sup> "The Economics of Adult Learning," UNESCO Institute for Education, 1997.

<sup>6</sup> The Impact of Vocational Education on Racial and Ethnic Minorities. ERIC/CUE Digest, Number 108.

in Utah for adults who have received a GED or high school diploma is nearly 15% higher compared with adults who have less than a high school diploma.<sup>7</sup>

From a public policy perspective, the gains of education that are reflected in increased employment and earnings can be translated into economic benefits. When compared with the costs to taxpayers of providing adult education, policy makers can better understand the net economic benefits of education. Such a comparison is part of benefit-cost analysis and is widely used to understand the net benefits or taxpayer return on education expenditure.

This paper is designed to provide Utah policy makers with a preliminary overview of the potential net economic benefits with a focus on the outcome measure of awarding of high school diplomas or GED certificates. In particular, the paper seeks to answer these four questions:

- How does adult education enhance employment and earnings?
- How do Utah taxpayers benefit from adult education programs?
- How much do adult education programs cost Utah taxpayer?
- How do benefits compare with costs of adult education programs?

Using data from the State of Utah for the year 2011, the paper finds:

- State expenditures relating to high school and GED diplomas resulted in:
  - Increased tax revenues of \$2.56 million.
  - Lower unemployment expenditures of \$2.62 million.
  - 27.9% of adults who obtain their GED or high school diploma continue on to 2 or 4 year higher education programs in Utah.

Note that the scope of these questions is somewhat narrow. Partly that is because this paper does focus attention on issues related to the Utah taxpayer. Benefits arising from adult education that are not readily translated into dollar magnitudes might be very important, but are not included in this study. Also, the study relies on data already available from the State of Utah. Because this study represents a new way of looking at

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<sup>7</sup> American Community Survey, PUMS Data, Utah, 2010.

the economics of education, relevant historical data are not available yet to address other important questions.

Labor market participation affects both taxpayer expenditure and revenue. On the expenditure side increase employment reduces taxpayer expenditure on human services, corrections, courts, employment and family services, and health expenditures.<sup>8</sup> On the revenue side, increased employment increases sales and use taxes, income taxes, and corporate taxes.

For the fiscal year ending June 30, 2010 annual dollar amounts relating to categories of expenditures and revenues potentially related to employment are presented in Table I.

**Table I**  
**Selected Fiscal Series**  
**State of Utah Comprehensive Annual Financial Report<sup>9</sup>**

Taxpayer Expenditures	Fiscal Year 2010
Human Services	\$669,169,000.00
Adult Corrections	\$238,902,000.00
Courts	\$118,577,000.00
Employment & Family Services	\$673,060,000.00
Health & Environmental Quality	\$1,875,775,000.00
Net Unemployment Compensation	\$548,226,000.00
Taxpayer Revenues	
Sales & Use Tax	\$1,416,447,000.00
Individual Income Tax	\$2,124,173,000.00
Corporate Taxes	\$266,961,000.00

Currently there is little information about how sensitive or responsive these categories of public expenditure are to changes in employment and earnings.<sup>10</sup>

<sup>8</sup> See, for example, <http://www.urban.org/url.cfm?ID=310836>, "Work and Barriers to Work among Welfare Recipients in 2002."

<sup>9</sup> State of Utah Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010. In this report only 9% Health & Environmental Quality expenditures are assumed to be related to unemployment.

<sup>10</sup> This measure of responsiveness is called elasticity. Utah provides estimates of sales tax and income tax elasticities related to personal income. See Governor's Office for Planning and Budget, State Short-Run Forecasts.

Measuring the sensitivity of revenue and expenditure to employment or unemployment is necessary to understand how taxpayers may benefit from increases in employment or reductions in unemployment which are the consequences of adult education.

These measures relate to the marginal or incremental benefits on expenditures or revenues attributable to employment. One way to estimate these measures is to divide a total category by the employment number. Such a ratio would be the average effect. For example, Utah spends over \$118 million on courts per year. Employment is just over 1.79 million workers so the average expenditure amounts to \$65.92 per employed person.<sup>11</sup> The flaw in estimating expenditure per employee using averages is that these numbers do not relate to changes in employment and include expenditures, such as fixed costs, that do not change as the economic climate changes.

In this report marginal effects relating expenditure and revenue changes to employment changes are estimated via statistical techniques using data over a five year period. A simple logarithmic model is fitted and the marginal effects for select series are presented below.

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<sup>11</sup> The total employment (2010) for persons between ages 25 and 64 is 968,232; Department of Workforce Services.

**Table II**  
**Estimates & Effect Sizes**  
**Selected Expenditure & Revenue Effects**

Dependent Variable	Independent Variable	Elasticity Estimate	Marginal Effect
Sales Tax Revenue	Employment	0.713	\$721.72
Income Tax Revenue	Employment	1.020	\$1,438.62
Health Expenditures	Unemployment	0.359	\$1,092.02
Family Services Expenditure	Unemployment	0.151	\$1,121.00

The dependent and independent variable columns in Table II are selected to capture plausible “cause and effect” relationships. For example in the first row, sales taxes are assumed to be primarily related to employment and the fourth row, expenditures on Family Services are assumed to be related mostly to changes in unemployment. The marginal effect represents an estimate of how much the State would gain in sales or income tax revenue resulting from a one new hire. Based on these results, a new hire (at average earnings) would result in enhanced sales tax revenue of just over \$720 and income tax revenue of just over \$1,400. Similarly, the marginal effects in rows three and four approximate how much the State must pay for a newly unemployed worker (primarily related to health and welfare expenditures).<sup>12</sup> If a worker moved out of the ranks of the unemployed, the State would save \$2,213.02 in reduced public health and welfare expenditures.<sup>13</sup> The total effect of changing a person status from unemployed to employed is \$4,373.36 in terms net taxpayer dollars per year.

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<sup>12</sup> Expressed in \$’s per year.

<sup>13</sup> These estimates can also be used in reverse – to estimate the effects of revenue loss and increased expenditure when a worker is fired.

Given these estimates of the revenue and expenditure the next step is to estimate the likelihood of an adult learner leaving unemployment or increasing earnings as a result of the acquisition of learning skills. These estimates are obtained by examining the effects of obtaining a GED or High School Equivalency Diploma. These effects are based on comparing adult learners' earnings and unemployment rates with those of high school dropouts.

As noted above, adult learners who have earned their GED or High School Diploma earn approximately 17% more than high school dropouts and have a 6% lower probability of being unemployed than high school dropouts. Utah is one of the few states that allow adults to choose either diploma or a GED thus giving adult learners more options to enhance their skills. Level gains are associated with enhanced employment also. This effect might be attributable to an adult learner's motivation and acquisition of skills that enhance employment prospects.

Nearly 26,000 adults enrolled in educational programs in Utah during 2011-12. Of these 3,849 earned high school diplomas, 1,424 earned GED certificates, and 9,626 achieved adult basic education level gains. Using current data reflecting Utah's level of employment and unemployment the following table estimates the economic effects attributable to 5,273 adult learners obtaining GED Certificates or High School Diplomas.<sup>14</sup> It is assumed that adult education lowered unemployment by one percentage point or that 1,185 fewer people were unemployed.<sup>15</sup> The effect of this is shown in Table III.

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<sup>14</sup> This paper focuses attention on employment and earnings arising from high school and GED completion due to the fact that data are most reliable on that link.

<sup>15</sup> A one percentage point relationship is conservative for the Utah data. There are wide ranges of estimates in the literature. See, for example, U.S. Department of Labor, Bureau of Labor Statistics, "Labor Composition and U.S. Productivity Growth, 1948-90." Washington, DC.

**Table III**  
**Economic Effects of Adult Education**  
**On Utah Tax Revenues & Expenditures**

Source	Employment	Unemployment	Taxpayer Benefit
Sales Tax Revenue	\$855,238.00		\$855,238.00
Income Tax Revenue	\$1,704,765.00		\$1,704,765.00
Health Expenditures		\$1,294,044.00	\$1,294,044.00
Family Services Expenditures		\$1,328,385.00	\$1,328,385.00
Total			\$5,182,432.00

Earnings increases for adult learners who earned a diploma or certificate would enhance both income and sales tax revenues by approximately 20%. Using estimates from the Governor's Office of Planning and Budget these earnings increases would contribute \$251,555 to income tax and \$125,777 to sales tax.<sup>16</sup> The gross gain to taxpayers with these inclusions is then \$5,559,764.

Whether or not this benefit is cost effective depends on the required taxpayer expenditure. Based on data supplied by the Utah State Office of Education, the incremental cost of a high school diploma or GED is \$284 based on the State's funding formula. This equates to expenditures of \$1,499,400 or 17% of the State's total expenditure of \$9 million on adult education.

From a benefit-cost perspective, Utah expenditure of \$1.5 million translated into \$5.18 million in taxpayer benefits, or a simple benefit-cost ratio of \$3.45. This is a conservative estimate in that not taxpayer benefits are captured in only expenditures on unemployment and public health, or revenues in income and sales taxes. Additionally,

<sup>16</sup> Elasticity estimates are based on 2003 data which are available at: <http://governor.utah.gov/dea/>. The average earnings for adults without a high school diploma are \$31,952 per year.

level gains toward a diploma or certificate enhance earnings and reduce the likelihood of unemployment. These beneficial effects are not estimated in this report.

Data from the Utah State Office of Education do show that 27.91% of adult learners who complete their GED or earn their high school diploma continue their education in Utah's system of higher education. For person with at least some college, 2010 Utah data show a remarkable decline in unemployment for this group compared with students who have less than a high school diploma (7.67% compared with 13.89%).<sup>17</sup> Similarly, for adults who have some college compared with adults who have less than a high school diploma, average annual income is 44% higher (\$39,909 compared with \$27,712).

Finally, research has demonstrated that adult education programs also serve to reduce crime and recidivism. The return on investment on these programs is slightly over double that presented in this report.<sup>18</sup> There are several reasons why institutional education is so cost effective. Primarily this is because crime is very expensive and small reductions in crime or recidivism translate to large public savings in direct taxpayer and victim effects.<sup>19</sup>

Although this is a preliminary report these findings are in accord with national research examining the economics of education. Taxpayer expenditures on adult education yield significant economic benefits that are realized via the Utah labor market. Education beyond high school is especially important for Utah citizens competing for higher paying jobs that require at least some higher education. The adult learning program provides an opportunity for a large number of students who seek to better their lives.

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<sup>17</sup> American Community Survey, PUMS Data, Utah, 2010.

<sup>18</sup> See, for example, <http://www.soros.org/initiatives/justice>. Estimates of the effects of adult education in Utah are available from the Utah Commission on Criminal and Juvenile Justice.

<sup>19</sup> For a detailed analysis that focuses attention on the relationship between employment and recidivism, see Blattenberger, Fowles, and Krantz, "Bayesian Models to Predict the Return to Prison," Proceedings of the Joint Statistical Meetings: Section on Bayesian Statistical Science, American Statistical Association, 2010.