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Oklahoma
Department of
Career and
Technology
Education
(ODCTE)

*The Economic Contribution of
CareerTech to the Oklahoma Economy*

Cost-Benefit Analysis of Career Majors (FY11) - Executive Summary

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Cost-Benefit Analysis of Career Majors

Lifetime Income Gains and the Impact on the Oklahoma Economy

Executive Summary

Cost-Benefit Analysis of CareerTech Career Majors

This report is part of an ongoing effort to assess the economic contribution of the CareerTech System to the Oklahoma economy. The specific objective of the study is to prepare a comprehensive cost-benefit assessment of the system's career major programs. Career majors are commonly viewed as the flagship program of the CareerTech System because of the large number of students enrolled and the extensive training received by students. The demand for these training programs continues to be driven by the desire of both employers and workers to match job skills over the work life more efficiently than is possible through access to common and higher education alone.

The study examines the cohort of career major completers for fiscal year 2010-2011 (FY11). In FY11, more than 16,000 adult and secondary school students completed a career major in preparation for a diverse set of fields ranging from health sciences to information technology. The study provides estimates of the range of private and public benefits and costs associated with delivering training to this cohort and assesses the expected net economic contribution to the Oklahoma economy. Policymakers generally support the subsidization of public education and training programs on the grounds that the resulting wage and productivity effects enhance economic activity over time.

Income Gains from Career and Technology Training

The need to measure the effectiveness of education at all levels has resulted in numerous empirical studies attempting to isolate the effects of occupation-based education and training on labor market outcomes. A growing consensus within this body of research is that career and technology education, as with other forms of postsecondary education, translates into higher income over the work life cycle. Wage survey data similarly continue to confirm that the added lifetime income gains from completing career and technology education can be sizeable. Recent Census Bureau survey data indicate that Oklahoma workers who have completed the equivalent of a two-year program with a vocational or occupational emphasis earned 20 percent more than workers with only high school diplomas the past two decades. These income gains can in turn contribute significantly to the overall level of income statewide.

A Model of Lifetime Income Gains from Training in Oklahoma

In the study, a lifetime income model is constructed that illustrates the composition of the income gains realized by career major completers following training. The model is developed using

established findings in the research literature on the returns to occupation-based training and education and empirical results from Oklahoma wage survey data. In the model, completers realize post-training income gains in four ways: 1) a wage increase upon entry into the workforce, 2) faster growth in earned income over the working lifetime, 3) faster growth in non-earned income (e.g., interest, dividends, and transfer payments) over the working lifetime, and 4) higher earned and non-earned income after the traditional retirement age of 65. Workers with career and technology training also work more hours per year and experience fewer periods of unemployment. For completeness, the model allows for completers to periodically drop out of the labor force and migrate in and out of the state.

Students Experience Significant Lifetime Income Gains

The model is applied to the 16,075 students completing career majors in FY11, and the results indicate that completers enjoy significant lifetime income gains relative to workers with similar demographics who complete only high school diplomas. Over the work life, a typical career major completer can expect to add more than \$475,000, or \$188,000 in current dollars, to lifetime earnings relative to completing no additional education beyond high school. Across all 16,075 FY11 completers, training is expected to add approximately \$3 billion in current dollars to future lifetime income. After adjusting for out-migration, approximately \$1.84 billion of the added income is estimated to be earned within Oklahoma.

The gains will be realized slowly over the work life of the average completer but cumulatively represent nearly 2 percent of the approximately \$150 billion in annual personal income the Oklahoma economy currently generates. Given an average expected work life for FY11 completers of approximately 40 years, the added future income gain of this cohort group is equivalent to \$75 million annually in current dollars, or nearly \$4,700 annually per completer.

Spillover Economic Benefits from Education and Training

The estimated migration-adjusted \$1.84 billion current dollar income gain for completers represents a significant addition to future income for students and potentially for the state economy. These added earnings are largely the embodiment of future education-driven productivity gains in output in the state economy that will support added future income payments to workers. There is also a long-held belief that education-generated income gains such as these play a key role in determining overall income levels in an economy. Economic research increasingly provides empirical evidence of a positive link from education levels to long-run economic growth.

Estimates of economic spillover suggest the added income gains of completers will support an additional \$1.66 billion in current dollars in future earnings accruing to other workers statewide, or a total current dollar income gain of nearly \$3.5 billion as a result of the training. Added sales and income taxes paid directly by completers to state and local government is estimated at \$137 million, or more than \$8,500 per completer. Through spillover effects, an additional \$123 million in taxes is expected to be paid by other workers statewide as their future earnings increase, for a total tax impact of \$260 million.

Cost-Benefit Analysis

The report further integrates the estimated work life income gains of completers and economic spillover estimates into an overall cost-benefit assessment of career majors. In the analysis, the benefits extend beyond the direct private return to the student and accrue indirectly to the broader economy. The benefits to education tend to accrue over many years, but costs are generally incurred upfront as the training is delivered. The costs are also borne by multiple parties and include direct and indirect costs.

In current dollars, the direct benefits are \$1.84 billion in future income gains to completers, \$138 million in added tax revenue to state and local government, and direct in-state spending of \$185 million for the delivery of the career major instructional programs statewide. Indirect benefits include \$1.66 billion in estimated spillover income gains to the broader state economy which in turn produce \$124 million in tax revenue.

Direct costs total \$229.3 million in net operating costs for instruction of the FY11 career major cohort. Indirect costs include \$101.6 million in total forgone income and tax revenue during two years of student training and \$114.5 million in deadweight loss to account for any potential negative effect on the private sector from funding the programs through tax revenue.

The cost-benefit estimates indicate that training the FY11 cohort of career major completers produced net direct benefits of \$1.93 billion. The estimated direct benefits (\$2.16 billion) are roughly 10 times the direct cost (\$229 million) to deliver career majors. Even when all direct and indirect costs (\$445 million) are considered, the direct benefits alone cover these costs nearly five times and produce a net benefit of \$1.7 billion in current dollars.

Adding indirect benefits to the analysis pushes total gross benefits to the Oklahoma economy to nearly \$4 billion in current dollars. The total gross benefit is nearly nine times the size of the total direct and indirect costs required to administer the programs. The estimated net benefit to the state economy, assuming all direct and indirect costs and benefits are realized, is \$3.5 billion in current dollars. The broader state economy receives an estimated \$1.66 billion in added spillover earnings, while state and local government receive an estimated \$262 million in total added tax revenue.

Other Benefits to Career and Technology Training

While this study focuses on increased earnings over the work life, other documented benefits can result from the completion of career majors. For example, research shows that occupation-based training provides faster entry into the labor force for young workers and increases the likelihood of becoming a professional or manager. Vocationally trained workers also have higher labor force participation rates and experience lower rates of unemployment than workers with only high school diplomas. Other potential socioeconomic benefits can accrue to the state as a result of reduced reliance on public services (e.g. unemployment compensation and welfare benefits), improved health benefits, and reduced absenteeism.

Cost-Benefit Analysis of Career Major Programs (FY11 Completers)

Benefits		Costs	
Direct		Direct	
PV of Direct Income Gains to Completers	\$3,031,945,266	Cost of Career Major Instruction	\$241,310,000
- Out-migration adjustment	-1,191,552,247	- Tuition, Fees, & Other Adjustments	-12,275,000
Net Direct Income Gains to Completers	1,840,393,019	Net Cost of Program Operations	229,035,000
Direct Tax Revenue to State/Local Govt. (Migration adjusted, present value)	138,029,476		
Instruction Expenditures (76.6% of cost)	184,843,460		
<i>Total Direct Benefits</i>	<i>\$2,163,265,955</i>		
Indirect		Indirect	
Spillover Income Gains (Migration adjusted, present value)	1,656,353,717	Forgone Wages During Training (Adults)	94,502,200
Spillover Tax Revenue	124,226,529	Forgone Tax Rev. During Training (Adults)	7,087,665
<i>Total Indirect Benefits</i>	<i>\$1,780,580,246</i>	Deadweight Loss (50% of net Prog. Costs)	114,517,500
Total Benefits	<u>\$3,943,846,201</u>	Total Costs	<u>\$445,142,365</u>
Net Benefit	\$3,498,703,836		