

Colorado Early Investment Model: Return on Investment in Early Care & Learning



Introduction

[The Colorado Early Investment Model](#) is a web-based tool that models our public investment in early childhood programs across four sectors identified by the [Early Childhood Colorado Framework](#) (Early Learning, Family Support and Education, Health, and Social and Emotional Health). Commissioned by the Colorado Early Childhood Leadership Commission (ECLC), the model captures the current state and federal funding in early childhood programs that serve at-risk children and their families, and computes the costs of changes to access and quality. In addition to capturing these costs, the model also computes the return on investment (ROI) for selected programs. The resulting tool is the first of its kind in the nation to include an extensive state database of public early childhood funding streams, as well as the ability to calculate return on investment.

ROI is a familiar concept to those in the business community. For investors, it refers to a ratio that compares costs to gains. A growing body of academic research applies the concept of return on investment to programs serving young children, and finds particularly strong returns for high-quality programs serving at-risk populations. In fact, the research demonstrates that early childhood programs are one of the most effective ways to invest public funding.

The first early childhood program whose long-term benefits were rigorously evaluated was the Perry Preschool Program, established in Ypsilanti, Michigan in the early 1960s. Children who participated in the program were tracked through age 40. Two other preschool programs that served high-needs kids in high-quality settings have also tracked children over time: the Abecedarian program, which provided year-round full-day center based care for children from birth through kindergarten; and the Chicago Child-Parent Centers, which tracked children in preschool and early elementary programs beginning in 1967. Research from these programs and others has provided a strong evidentiary base for the effectiveness of early childhood interventions.

The Colorado Early Investment Model builds on this research by adapting it to match Colorado's de-

mographics and programs. The model contains ROI data for ten programs with robust underlying research, from early learning to home visiting and family support. These programs were selected because credible academic research was available that quantified the economic returns for a child who participated in the program. Other programs, while not included in the model's ROI calculations, may also have developmental benefits.

Methodology

Calculating Costs and Benefits

Early childhood programs generate a range of benefits. These include direct benefits to children, such as increased high school graduation rates and reduced incarceration rates, as well as economic returns to school districts, state or federal funding sources, parents, or other entities. The Colorado Early Investment Model contains ROI data for ten programs, however, for the purposes of this brief we limit the analysis to economic costs and benefits for early care and learning programs.

Our results are derived from peer-reviewed and nationally-recognized research. They present the economic costs and benefits for Colorado programs receiving state or federal funding. The "cost" portion of the analyses use publically-reported annual funding and per-child cost data from 2011 and 2012, and incorporate an extensive analysis of the costs of high quality child care based on the requirements specified by each of the four Qualistar quality levels.

The model incorporates both programmatic costs incurred by a particular agency to provide services, and true costs to run a program at a given quality level. These "true costs" may be higher than the programmatic costs if agency allocations are supplemented by parent fees or additional funding streams. For example, in Colorado, the Colorado Preschool Program is funded at \$3500 per child for half day programming, but the true costs to provide full-day high-quality care for four-year olds can be as high as \$12,000 per year. In order to provide the most realistic cost estimates, our ROI analyses use the true costs of quality child care, not the agency funding allocations for these programs.

The “benefits” are calculated on a per-student basis based on the body of academic research tying specific early childhood interventions to later financial returns. These benefits calculations are adjusted to reflect costs in Colorado. The ROI for a given program is calculated by dividing the benefits by the costs for a particular group of children. For example, if the cost to send 1,000 children to high-quality preschool is \$5 million but the economic benefits are \$10 million, the ROI is \$10 million/\$5 million, or 2.

The Impact of Investing in Early Learning Programming

To demonstrate the impact of investing, this brief investigates the changes in costs and benefits of three scenarios modeled using the Colorado Early Investment Model:

- **Current Investment:** What is the current state investment and economic return due to early childhood programming through early care and learning programs?
- **Increased Enrollment:** What is the cost and return of providing preschool to children on the Colorado Preschool Program (CPP) waitlist (approximately 7,800 children)?
- **Improved Quality:** What is the cost and return of moving all children in 1- or 2-star child care programs to 3-star programs?

Limitations to ROI

Return on Investment must be applied carefully when analyzing early childhood programs, several factors impact the returns and what they say about programs:

- The amount of return associated with a program is influenced by the length of observation, the longer the returns are measure, the more are recorded and the higher the return
- Current ROI research is focused on early care and learning programs, research on ROI for other early childhood programs is limited due to the cost to study
- ROI is only one factor in assessing a program, programs also produce learning and development outcomes essential to children. The linking factor for all outcomes is the quality of the setting.

Return Type	Return Per Dollar Invested	ROI Under Current System*
Overall	\$8.79	\$2,147
Child Care	\$1.13	\$276
Future Income	\$1.56	\$382
Repeated Grades	\$0.08	\$19
SPED	\$0.48	\$117
Grad Rates	\$2.26	\$551
Child Welfare	\$0.05	\$13
Criminal Justice	\$0.85	\$207
Reduced Welfare	\$0.39	\$95
Taxes	\$1.73	\$423
Other	\$0.26	\$64

Current Investment

Figure 1 presents current state investments and returns based on the early care and learning programs with ROI in the Colorado Early Investment Model. Colorado currently invests \$244 million in these early childhood programs with the return on investments totaling \$2.1 billion dollars, or \$8.79 per every dollar invested. Based on our current investment alone, Colorado will already see long-term benefits in a range of categories. These include the following:

- economic benefits of child care;
- increased future income of children due to increased high school graduation and college participation;
- fewer repeated grades and reduced special education (SPED) rates for children who participated in preschool;
- reduced placement rates in the child welfare system, including the adoption and foster care systems;
- reduced use of the criminal justice system for juveniles;
- reduced welfare payments; and
- increases in the tax base due to increased income.

It is important to note that while increased investments yield much higher returns, the opposite relationship also holds. For every dollar removed from current funding, the net return will be reduced by \$8.79. This means that while reductions in funding may produce immediate savings, the savings are greatly outweighed by the loss in returns.

Figure 1: Colorado’s Current Investments and Returns (in millions of dollars*)

Figure 2: Expansion of CPP (7,800 additional enrollees)

Increased Enrollment

The second scenario examines the effect of expanding the Colorado Preschool Program to accommodate the approximate number of children on the waitlist. CPP currently invests \$71 million in preschool for at-risk children, and the current benefits to the economy total \$500 million. The expansion would cost about \$36 million, but additional returns would total \$201 million. This results in an overall net return of \$700 million and a total program cost of \$108 million, or about \$6.50 for every dollar invested. The returns due to increased graduation rates, future income, and increased taxes would each more than cover the cost of expansion.

	Current ROI *	Add'l ROI *	Total ROI *	Return Per \$ Invested
Overall	\$500	\$201	\$700	\$6.50
Child Care	\$63	\$29	\$92	\$0.86
Future Income	\$92	\$36	\$128	\$1.19
Repeated Grades	\$5	\$2	\$7	\$0.06
SPED	\$28	\$11	\$39	\$0.37
Grad Rates	\$133	\$52	\$185	\$1.72
Child Welfare	\$3	\$1	\$4	\$0.04
Criminal Justice	\$50	\$20	\$70	\$0.65
Reduced Welfare	\$23	\$9	\$32	\$0.30
Taxes	\$102	\$40	\$142	\$1.32

Figure 3: Quality Improvement (all enrollees in 1 or 2 star now in 3 star) in millions of dollars*

	ROI Under Current System*	Return Per Dollar Invested (Current)	Additional ROI Under Proposed System*	Total ROI Under Proposed System*	Return Per Dollar Invested (Proposed)
Overall	\$2,147	\$9.43	\$2,126	\$4,202	\$13.82
Child Care	\$276	\$1.24	\$329	\$602	\$1.98
Future Income	\$382	\$1.72	\$380	\$758	\$2.49
Repeated Grades	\$19	\$0.09	\$19	\$38	\$0.12
SPED	\$117	\$0.53	\$116	\$232	\$0.76
Grad Rates	\$551	\$2.58	\$547	\$1,092	\$3.59
Child Welfare	\$13	\$0.06	\$13	\$26	\$0.08
Criminal Justice	\$207	\$0.93	\$206	\$411	\$1.35
Reduced Welfare	\$95	\$0.43	\$94	\$188	\$0.62
Taxes	\$423	\$1.90	\$420	\$831	\$2.76

Improved Quality

The current quality system is funded at roughly \$220 million, with a total ROI of \$2.1 billion. The final scenario depicts the impact of increasing the quality of child care programs while keeping enrollment constant. In this scenario, all children who are currently in 1- or 2-star child care programs are moved to 3-star programs, while students in 4-star programs remain where they are. Improving quality in this way yields \$2.1 billion in additional returns with an additional program cost of \$84 million. This results in an overall net return of \$4.2 billion based on a total program cost of \$304 million. It is important to note that the ROI per dollar invested changes in this scenario as quality improves. While the current system has a return of \$9.42 per dollar invested, an improved system will have a return of nearly \$14 per dollar invested. This enormous impact occurs because higher-quality programs produce greater returns. These programs offer more qualified teachers, more extensive services, and better instructional materials and curricula.

Note: Overall figures may not exactly equal the sum of subcategories due to rounding error

Implications and Conclusion

The body of research literature on the costs and benefits of early childhood education (ECE) demonstrates that ECE is a good economic investment. In Colorado, the impact of reducing or increasing the size or quality of the early childhood system has a substantial impact on the returns due to the system.

Even small funding cuts of 5% could have serious negative effects on future benefits, amounting to up to \$100 million.

On the other hand, **even small increases in services can yield economic benefits for years to come.** Investing \$36 million in CPP would not only provide child care to nearly 8,000 additional children, but it would provide additional returns of \$201 million dollars to school districts, parents, state and federal revenue streams, and the students themselves.

While the economic benefits of the programs included in this analysis are substantial, the complete early investment model contains a variety of programs that serve at-risk populations. Each program provides unique services and may produce a variety of meaningful outcomes. ROI is one measure to quantify the return on investment for various programs, but **programs currently without ROI data still advance the learning and development of children.**

Our analyses demonstrate that the **ROI is greatest in high-quality settings.** They are also most pronounced for at-risk children accessing the type of services contained within the model. Cost-benefit analyses are becoming increasingly important as programs compete for limited resources, and policymakers take into account evidence about the effectiveness of various types of investments. Investing in early childhood programs is one of the best ways our state can secure an economically healthy future and create a generation of successful adults.

Selected Bibliography

- Aos, S., Lee, S., Drake, E., Pennucci, A., Klima, T., Miller, M., ... Burley, M. (2011). *Return on investment: Evidence-based options to improve statewide outcomes*. Olympia: Washington Institute for Public Policy. Retrieved from <http://www.adolescentwellness.org/wp-content/uploads/2011/11/ROI-SSDP-2.11-per-1-report-appendix-2.pdf>
- Aos, S., Miller, M., & Mayfield, J. (2007). Benefits and Costs of K-12 Educational Policies: Evidence-Based Effects of Class Size Reductions and Full-Day Kindergarten. Washington State Institute for Public Policy. Retrieved from <https://cuvpn.colorado.edu/rptfiles/,DanalInfo=www.wsipp.wa.gov+07-03-2201.pdf>
- Deming, D. (2009). *Early Childhood Intervention and Life-Cycle Skill Development: Evidence from Head Start*. American Economic Journal: Applied Economics. 1 (3): 111-134.
- Isaacs, J. (2007). *Cost-effective investments in children*. Brookings Institution.
- Karoly, L. A., & Bigelow, J. H. (2005). *The Economics of Investing in Universal Preschool Education in California*. Rand Corporation.
- Light, M., Wagner, C., Horvath, G., & Wobbekind, R. (2004). The economic impact of child care in Colorado. Colorado Children's Campaign. Retrieved from http://economicdevelopmentandchildcare.org/documents/databases/economic_impact_studies/45/report.pdf
- Reynolds, A. J., & Temple, J. A. (2008). Cost-effective early childhood development programs from preschool to third grade. *Annu. Rev. Clin. Psychol.*, 4, 109–139.

Colorado Early Investment Model

The Colorado Early Investment Model is available at www.coearlyinvestmentmodel.org, simply register for this free tool and you are ready to begin. The investment model homepage contains a user guide and technical manual which we encourage all to review prior to using the model.

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