

The WSIPP benefit-cost analysis examines, on an apples-to-apples basis, the monetary value of programs or policies to determine whether the benefits from the program exceed its costs. WSIPP's research approach to identifying evidence-based programs and policies has three main steps. First, we determine "what works" (and what does not work) to improve outcomes using a statistical technique called meta-analysis. Second, we calculate whether the benefits of a program exceed its costs. Third, we estimate the risk of investing in a program by testing the sensitivity of our results. For more detail on our methods, see our [Technical Documentation](#).

Current estimates replace old estimates. Numbers will change over time as a result of model inputs and monetization methods.

## Becoming a Man (BAM) with high-dosage tutoring Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated April 2018.

Program Description: Becoming a Man (BAM) is a high school behavioral program that offers non-academic intervention to disadvantaged and at-risk males through exposure to prosocial adults and skill training based on cognitive behavioral therapy. The program focuses on teaching character and social-emotional skills including considering another person's perspective, evaluating consequences ahead of time, and reducing automatic decision-making. Participants attend weekly one-hour group sessions offered during the school day. The program included in this analysis combines BAM with individualized math tutoring conducted for one hour each day in groups of two students.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$9,308	Benefit to cost ratio	\$8.60
Participants	\$21,865	Benefits minus costs	\$35,664
Others	\$11,534	Chance the program will produce	
Indirect	(\$2,348)	benefits greater than the costs	72 %
<b>Total benefits</b>	<b>\$40,359</b>		
<b>Net program cost</b>	<b>(\$4,695)</b>		
<b>Benefits minus cost</b>	<b>\$35,664</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

## Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$21,865	\$9,308	\$11,534	\$0	\$42,707
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$2,348)	(\$2,348)
<b>Totals</b>	<b>\$21,865</b>	<b>\$9,308</b>	<b>\$11,534</b>	<b>(\$2,348)</b>	<b>\$40,359</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

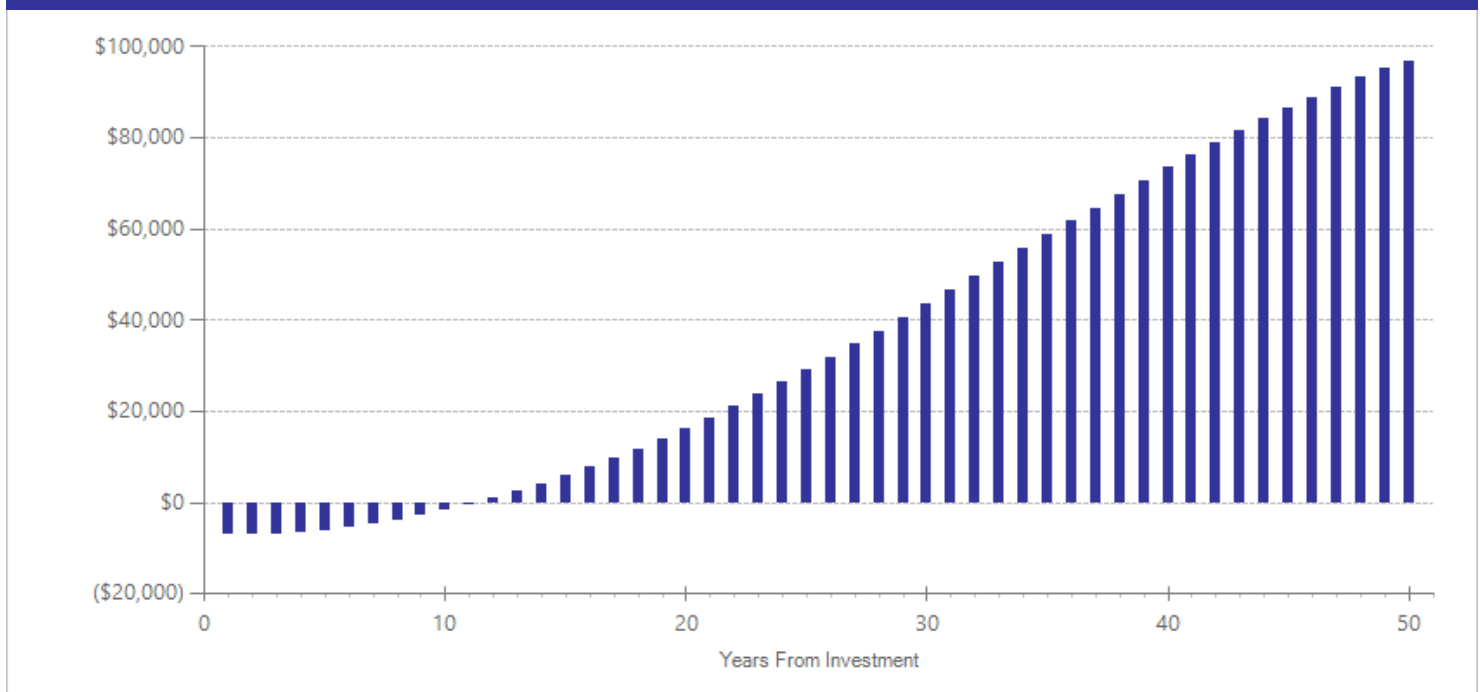
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$4,400	2013	Present value of net program costs (in 2018 dollars)	(\$4,695)
Comparison costs	\$0	2013		Cost range (+ or -)

The intervention in this analysis occurred over one school year. The estimated cost for BAM with high-dosage tutoring is \$4,400 per student as reported in Cook, P.J., Dodge, K., Farkas, G., Fryer, R.G., Guryan, J., Ludwig, J., ... Steinberg, L. (2014). The (surprising) efficacy of academic and behavioral intervention with disadvantaged youth: Results from a randomized experiment in Chicago (NBER Working Paper 19862). Cambridge, MA: National Bureau of Economic Research.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects											
Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Grade point average <sup>^</sup>	16	1	72	0.350	0.210	16	n/a	n/a	n/a	0.350	0.095
Office discipline referrals <sup>^</sup>	16	1	72	0.073	0.208	16	n/a	n/a	n/a	0.073	0.726
School attendance <sup>^</sup>	16	1	68	0.352	0.221	16	n/a	n/a	n/a	0.352	0.111
Suspensions/expulsions <sup>^</sup>	16	1	68	-0.210	0.220	16	n/a	n/a	n/a	-0.210	0.338
Test scores	16	1	60	0.217	0.251	16	0.208	0.276	17	0.217	0.387

<sup>^</sup>WSIPP’s benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

Cook, P.J., Dodge, K., Farkas, G., Fryer, R.G., Guryan, J., Ludwig, J., ... Steinberg, L.. (2014). *The (surprising) efficacy of academic and behavioral intervention with disadvantaged youth: Results from a randomized experiment in Chicago* (NBER Working Paper 19862). Cambridge, MA: National Bureau of Economic Research.

## Consultant teachers: Literacy Collaborative Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2018.

Program Description: Literacy Collaborative is a comprehensive teacher professional development model that uses coaching for teachers as a primary strategy to improve instructional practices and student outcomes. The program provides up to 35 days of training at university sites to literacy coaches before placement in schools, as well as on-going training and support. Coaches provide professional development and work one-on-one with classroom teachers with a focus on the specific instructional strategies in the Literacy Collaborative model. The evaluation included in this analysis measures the impact of the model on students in grades K–2 after three years of implementation.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$6,243	Benefit to cost ratio	\$36.28
Participants	\$14,665	Benefits minus costs	\$27,476
Others	\$7,736	Chance the program will produce	
Indirect	(\$389)	benefits greater than the costs	100 %
<u>Total benefits</u>	<u>\$28,255</u>		
<u>Net program cost</u>	<u>(\$779)</u>		
Benefits minus cost	\$27,476		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$14,665	\$6,243	\$7,736	\$0	\$28,644
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$389)	(\$389)
Totals	\$14,665	\$6,243	\$7,736	(\$389)	\$28,255

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

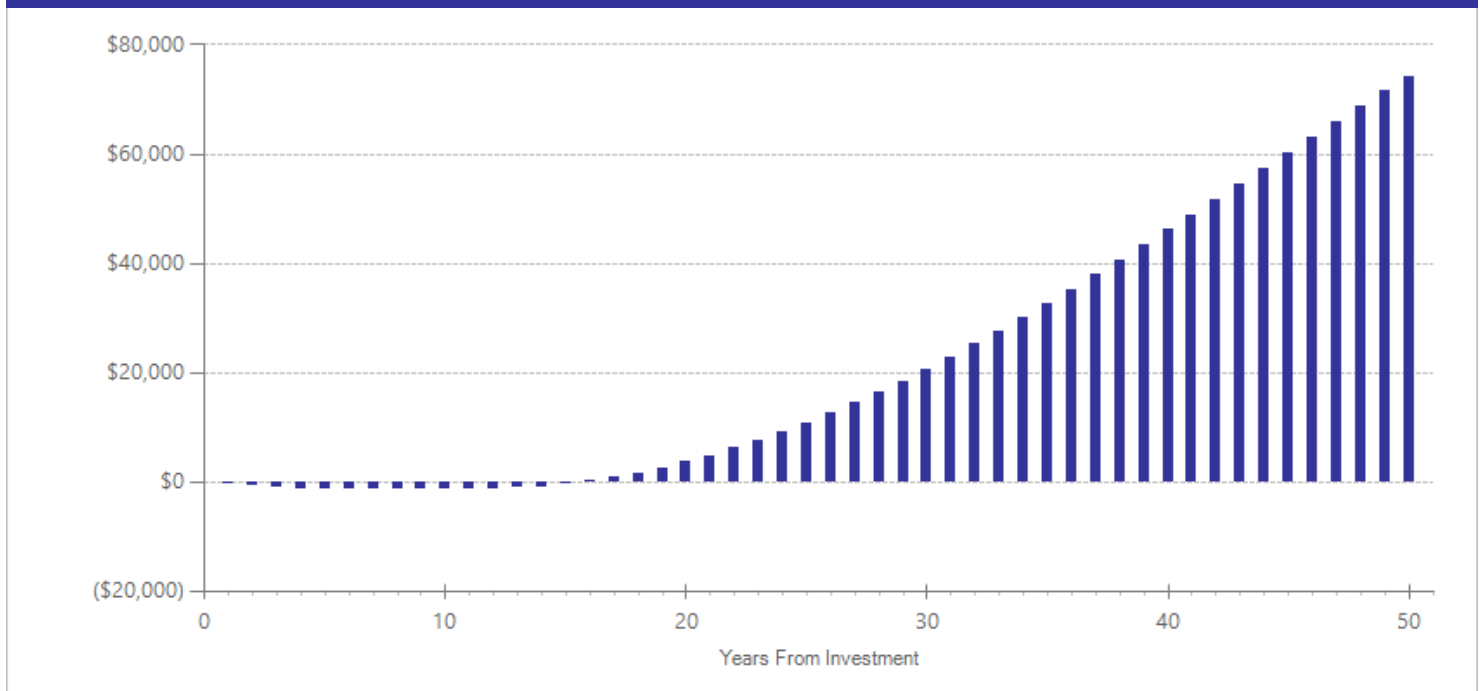
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$192	2013	Present value of net program costs (in 2018 dollars)	(\$779)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

Cost is based on published literacy coach training costs, including training fees, travel, and materials, from Ohio State University (2014). *Costs for Literacy Collaborative literacy coach training 2014-2015*, Columbus Ohio, OH: author. The estimate also includes salary costs for coach and teacher time based on the average compensation cost (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction. To calculate a per-student annual cost, we used the number of students in grades K-2 in Washington's prototypical schools formula. Costs reflect the average annual cost per-student assuming three years of implementation and one year of training.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	6	1	3348	0.428	0.025	6	0.171	0.028	17	0.428	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

Biancarosa, G., Bryk, A.S., & Dexter, E.R. (2010). Assessing the value-added effects of Literacy Collaborative professional development on student learning. *The Elementary School Journal*, 111(1), 7-34.

## Double-dose classes Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated May 2015.

Program Description: Double dose classes are provided to middle and high school students struggling in reading or, more typically, math. Students participating in this intervention enroll in two reading or math classes instead of one, thus doubling their instructional time in these subjects.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,936	Benefit to cost ratio	\$34.81
Participants	\$9,192	Benefits minus costs	\$17,279
Others	\$4,905	Chance the program will produce	
Indirect	(\$244)	benefits greater than the costs	98 %
<b>Total benefits</b>	<b>\$17,790</b>		
<b>Net program cost</b>	<b>(\$511)</b>		
<b>Benefits minus cost</b>	<b>\$17,279</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$23	\$56	\$11	\$91
Labor market earnings associated with test scores	\$9,192	\$3,913	\$4,849	\$0	\$17,955
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$256)	(\$256)
<b>Totals</b>	<b>\$9,192</b>	<b>\$3,936</b>	<b>\$4,905</b>	<b>(\$244)</b>	<b>\$17,790</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

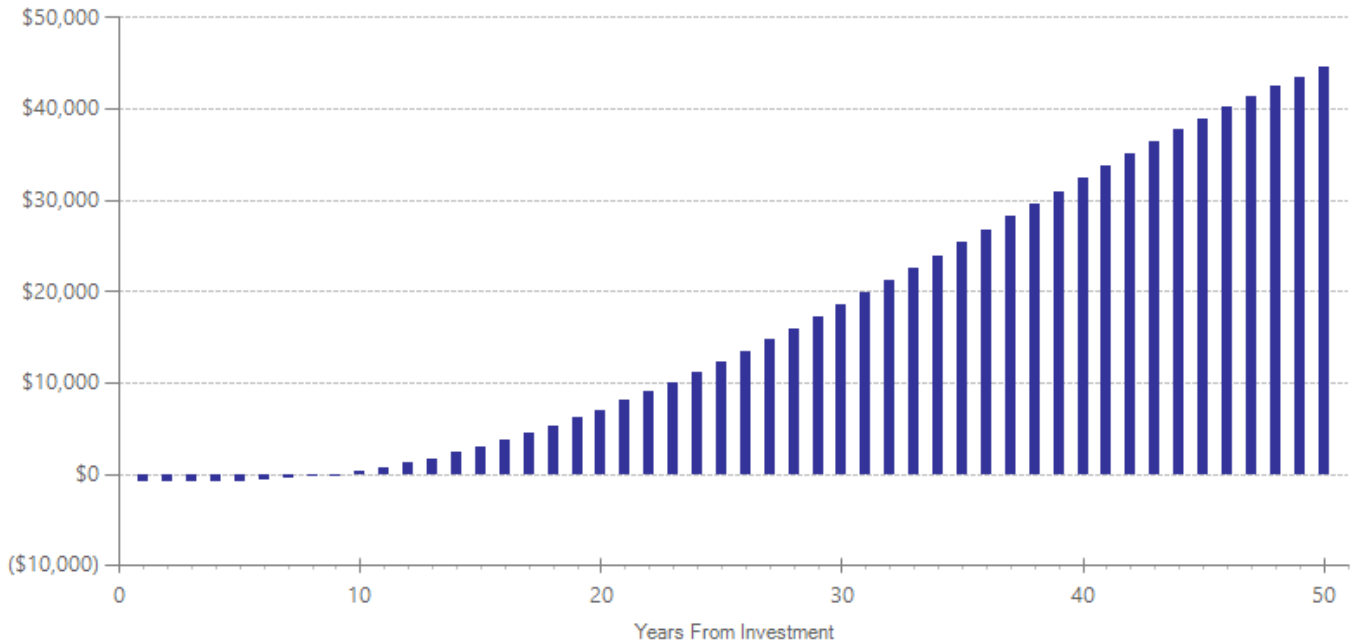
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$479	2013	Present value of net program costs (in 2018 dollars)	(\$511)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the studies reviewed for this estimate, providing "double dose" classes required hiring approximately 15% more teachers to cover the additional classes (this figure accounts for a partial cost offset from hiring fewer elective course teachers). Teachers were provided with three days of professional development and curriculum materials for implementation. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for teachers as reported by the Office of the Superintendent of Public Instruction and add per-student curriculum and teacher training costs.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	13	2	10463	0.045	0.022	18	0.045	0.022	18	0.045	0.040
Test scores	13	5	30857	0.093	0.041	13	0.093	0.041	17	0.093	0.023

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).



## Citations Used in the Meta-Analysis

- Bartik, T.J., & Lachowska, M. (2014). *The effects of doubling instruction efforts on middle school students' achievement: Evidence from a mutiyear regression-discontinuity design* (Working Paper 14-205). Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
- Cortes, K., Goodman, J., & Nomi, T. (2014). *Intensive math instruction and educational attainment: Long-run impacts of double-dose algebra* (Working Paper 20211). Cambridge, MA: National Bureau of Economic Research.
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- Fryer, R.G. (2011). *Injecting successful charter school strategies into traditional public schools: Early results from an experiment in Houston* (NBER Working Paper 17494). Cambridge, MA: National Bureau of Economic Research.
- Taylor, E. (2014). Spending more of the school day in math class: Evidence from a regression discontinuity in middle school. *Journal of Public Economics*, 117, 162-181.

## Tutoring: By peers Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated July 2014.

Program Description: Generally, peer tutoring is an instructional strategy that uses students to provide academic assistance to struggling peers. Peer tutoring may use students from the same classrooms or pair older students with younger struggling students. Tutoring assistance can occur through one-on-one interactions or in small groups and in some instances students alternate between the role of tutor and tutee. The specific types of peer tutoring that have been evaluated and are included in this meta-analysis are (in no particular order) ClassWide Peer Tutoring, Peer-Assisted Learning Strategies, and Reciprocal Peer Tutoring. The evaluated tutoring programs in this analysis provide, on average, about 30 hours of peer tutoring time each year and about six hours of training time for teachers and students to learn program procedures.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,699	Benefit to cost ratio	\$142.80
Participants	\$8,690	Benefits minus costs	\$16,795
Others	\$4,584	Chance the program will produce	
Indirect	(\$59)	benefits greater than the costs	83 %
<b>Total benefits</b>	<b>\$16,914</b>		
<b>Net program cost</b>	<b>(\$118)</b>		
<b>Benefits minus cost</b>	<b>\$16,795</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$8,690	\$3,699	\$4,584	\$0	\$16,973
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$59)	(\$59)
<b>Totals</b>	<b>\$8,690</b>	<b>\$3,699</b>	<b>\$4,584</b>	<b>(\$59)</b>	<b>\$16,914</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

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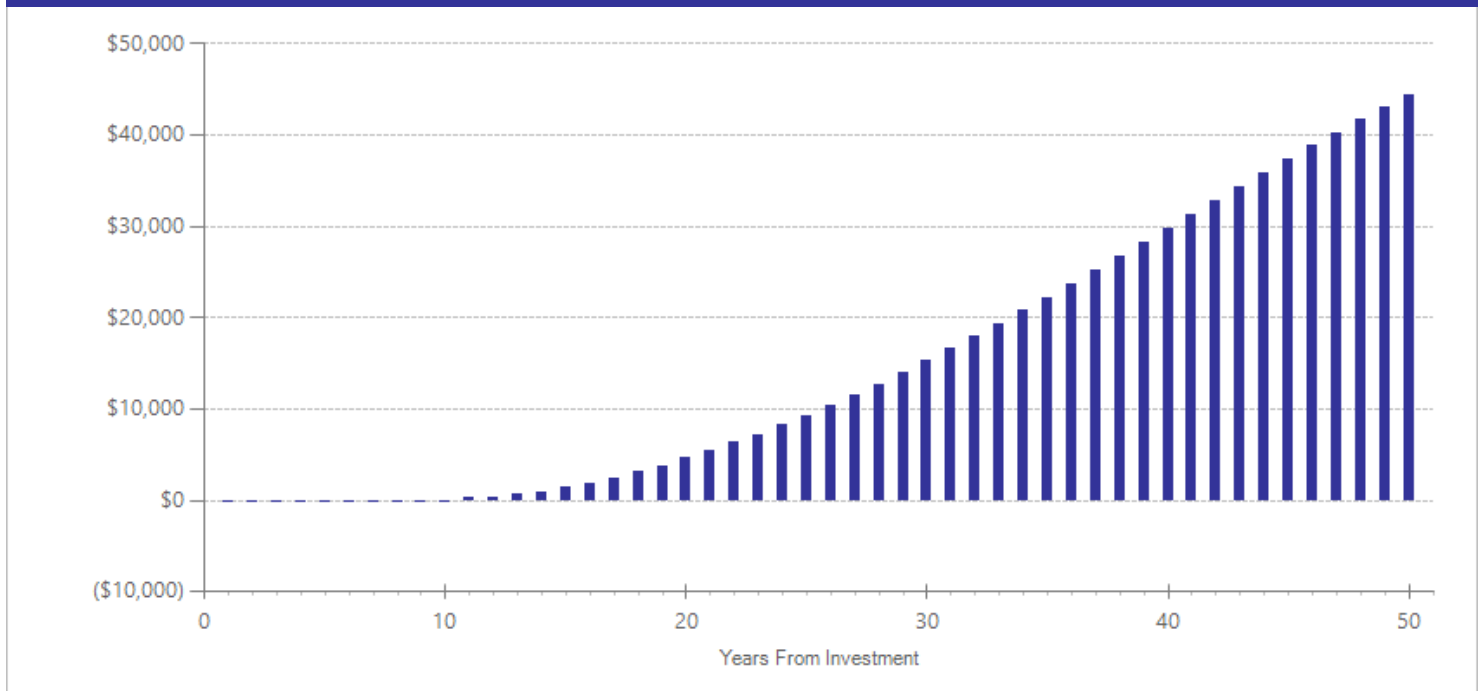
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$111	2013	Present value of net program costs (in 2018 dollars)	(\$118)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in this meta-analysis, the average peer tutoring program provides 30 hours tutoring time and six hours of training time per class. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction, divided by the number of students per classroom in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	9	8	400	0.159	0.090	9	0.095	0.099	17	0.334	0.002

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

- Dion, E., Roux, C., Landry, D., Fuchs, D., Wehby, J., & Dupere, V. (2011). Improving attention and preventing reading difficulties among low-income first-graders: A randomized study. *Prevention Science, 12*(1), 70-79.
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## Summer book programs: Multi-year intervention Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated February 2018.

Program Description: The summer book program included in this analysis provides 12 free books to elementary students each year for three consecutive years. The program focuses on early elementary students in 1st and 2nd grade. The main goal is to increase book access and voluntary summer reading for children from low-income families. Students self-select books each year at a book fair. The available books are screened for text difficulty. The studies included in this analysis measure the program's impact after three years.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,602	Benefit to cost ratio	\$72.66
Participants	\$8,460	Benefits minus costs	\$16,186
Others	\$4,463	Chance the program will produce	
Indirect	(\$113)	benefits greater than the costs	70 %
<b>Total benefits</b>	<b>\$16,411</b>		
<b>Net program cost</b>	<b>(\$226)</b>		
<b>Benefits minus cost</b>	<b>\$16,186</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$8,460	\$3,602	\$4,463	\$0	\$16,524
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$113)	(\$113)
<b>Totals</b>	<b>\$8,460</b>	<b>\$3,602</b>	<b>\$4,463</b>	<b>(\$113)</b>	<b>\$16,411</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

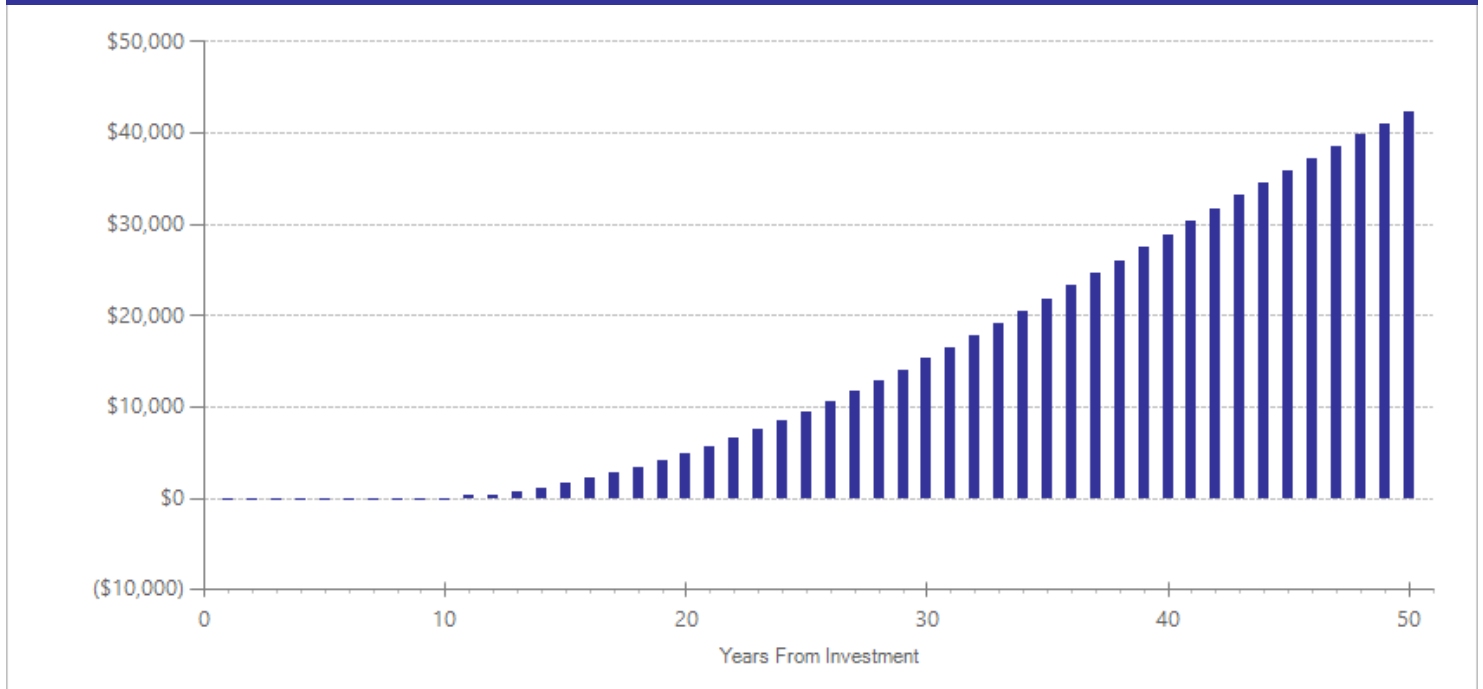
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$73	2013	Present value of net program costs (in 2018 dollars)	(\$226)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

These multi-year interventions typically run for three years. To calculate a per-student annual cost, we use average Washington State compensation costs (including benefits) for a K–8 teacher as reported by the Office of the Superintendent of Public Instruction to account for the time it takes teachers to administer the program divided by the average number of students per classroom in Washington's prototypical schools formula. In addition to compensation, the estimate accounts for the cost of purchasing 12 books per student each year.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	1	852	0.138	0.147	10	0.091	0.162	17	0.138	0.346

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

Allington, R.L., McGill-Franzen, A., Camilli, G., Williams, L., Graff, J., Zeig, J., . . . Nowak, R. (2010). Addressing summer reading setback among economically disadvantaged elementary students. *Reading Psychology, 31*(5), 411-27.

# Teacher professional development: Use of data to guide instruction

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: One form of teacher professional development (PD) involves training teachers how to use student academic assessment data to modify and improve instruction. This type of PD is usually paired with computer software that tracks and reports student assessment data to teachers. The specific types of assessments and software that have been evaluated and are included in this meta-analysis are (in no particular order) ISI (Individualized Student Instruction) using A2i software, Data-Driven District (3D), mCLASS/Acuity, Looking at Student Work, Formative Assessments of Student Thinking in Reading (FAST-R), and 4sight.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,343	Benefit to cost ratio	\$133.95
Participants	\$7,852	Benefits minus costs	\$15,165
Others	\$4,142	Chance the program will produce	
Indirect	(\$57)	benefits greater than the costs	99 %
<b>Total benefits</b>	<b>\$15,279</b>		
<b>Net program cost</b>	<b>(\$114)</b>		
<b>Benefits minus cost</b>	<b>\$15,165</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$7,852	\$3,343	\$4,142	\$0	\$15,336
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$57)	(\$57)
<b>Totals</b>	<b>\$7,852</b>	<b>\$3,343</b>	<b>\$4,142</b>	<b>(\$57)</b>	<b>\$15,279</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.



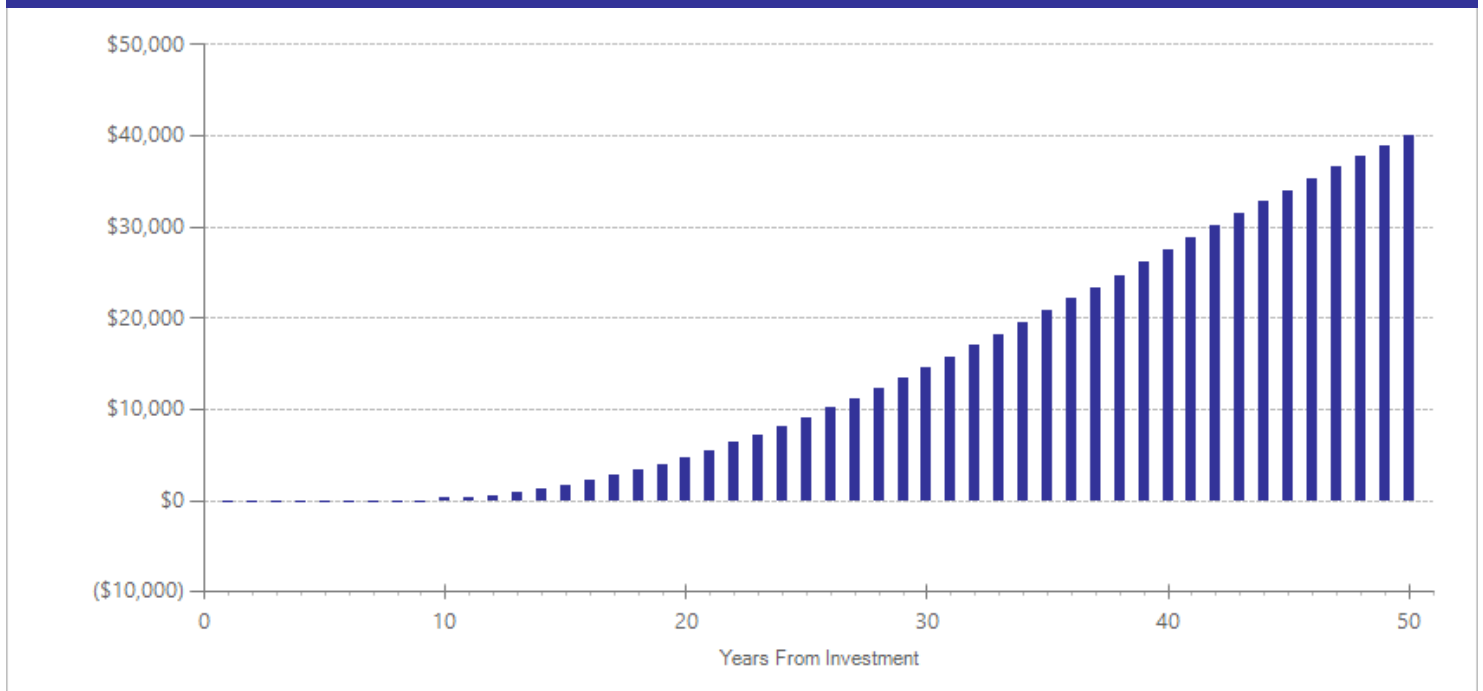
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$107	2013	Present value of net program costs (in 2018 dollars)	(\$114)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, teachers received an average of 26 hours of training in how to use student assessment data to guide instruction. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs to account for the overhead (i.e. facility, computer, and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	10	10541	0.117	0.035	11	0.084	0.038	17	0.190	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## State early childhood education programs: Universal Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated July 2019.

Program Description: To be considered a pre-kindergarten program, the program must have had an age requirement of three or four at the start of the program and an education focus. This analysis includes studies of children attending a state- or district-funded universal pre-kindergarten program, where all children in the state/district are eligible for the program, after 1975. Programs examined offered ECE services on a part-time and/or full-time basis. Comparison students may have received child care provided by family/non-family members, another preschool program, or Head Start.

We exclude programs that provided childcare subsidies, focused on the provision of general childcare, focused on parent and child development, and/or provided more extensive wraparound services.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$6,499	Benefit to cost ratio	\$3.15
Participants	\$11,986	Benefits minus costs	\$15,022
Others	\$6,323	Chance the program will produce	
Indirect	(\$2,797)	benefits greater than the costs	78 %
<b>Total benefits</b>	<b>\$22,012</b>		
<b>Net program cost</b>	<b>(\$6,990)</b>		
<b>Benefits minus cost</b>	<b>\$15,022</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$11,986	\$5,103	\$6,323	\$0	\$23,412
K-12 grade repetition	\$0	\$152	\$0	\$76	\$228
K-12 special education	\$0	\$1,244	\$0	\$622	\$1,866
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$3,495)	(\$3,495)
<b>Totals</b>	<b>\$11,986</b>	<b>\$6,499</b>	<b>\$6,323</b>	<b>(\$2,797)</b>	<b>\$22,012</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

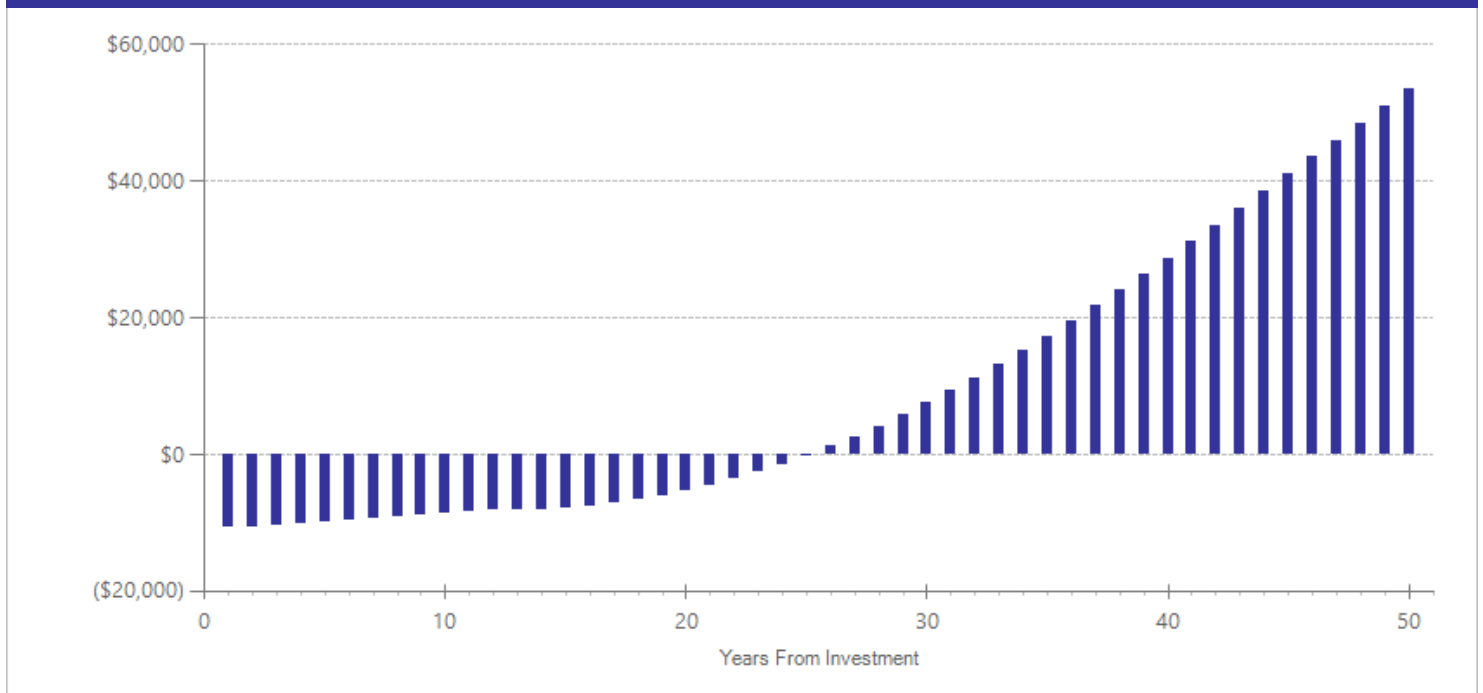
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$9,330	2018	Present value of net program costs (in 2018 dollars)	(\$6,990)
Comparison costs	\$2,340	2018	Cost range (+ or -)	25 %

The cost of participation in universal early childhood education programs are estimated from Washington's Early Childhood Education Assistance Program (ECEAP) for low-income preschoolers (2019-20 ECEAP Contractor Slots, Models, Overincome Allotments, and Funding [https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP\\_Contractor\\_slots\\_models\\_funding.pdf](https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP_Contractor_slots_models_funding.pdf)). The comparison group cost consists of an estimate of all children in Washington who would have been age-eligible to participate in ECEAP/Head Start (ignoring income/ other eligibility requirements) who are participating in Head Start, receiving state-funded childcare subsidies, or receiving no state-funded care. The cost of Head Start participation was provided by T. Saenz-Thompson (personal communication, Office of Head Start Region 10, October 24, 2019). The cost of receiving state-funded childcare subsidies is based on Washington's childcare subsidy reimbursement rates as of February 2019 (<https://www.dcyf.wa.gov/node/1640>). The comparison group cost is a weighted average of the costs of Head Start, state-subsidized childcare, and no state-funded care.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Executive function <sup>^</sup>	4	1	1009	0.183	0.045	4	n/a	n/a	n/a	0.183	0.001
Grade point average <sup>^</sup>	4	1	991	0.056	0.045	12	n/a	n/a	n/a	0.056	0.212
K-12 grade repetition	4	3	513943	-0.156	0.117	9	-0.156	0.117	9	-0.156	0.181
K-12 special education	4	1	991	-0.079	0.060	12	-0.079	0.060	12	-0.079	0.186
Office discipline referrals <sup>^</sup>	4	1	29709	-0.010	0.011	7	n/a	n/a	n/a	-0.010	0.348
School attendance <sup>^</sup>	4	1	991	0.000	0.045	12	n/a	n/a	n/a	0.000	1.000
Suspensions/expulsions <sup>^</sup>	4	1	991	0.015	0.060	12	n/a	n/a	n/a	0.015	0.801
Test scores	4	4	4055	0.470	0.083	5	0.146	0.092	17	0.470	0.001

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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# Tutoring: By adults for English language learner students

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated July 2014.

Program Description: In this analysis, we include studies that compared one-on-one tutoring programs for English Language Learner (ELL) students, with regular classroom reading instruction without supplemental tutoring.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,721	Benefit to cost ratio	\$10.80
Participants	\$8,740	Benefits minus costs	\$14,807
Others	\$4,611	Chance the program will produce	
Indirect	(\$755)	benefits greater than the costs	68 %
<b>Total benefits</b>	<b>\$16,317</b>		
<b>Net program cost</b>	<b>(\$1,510)</b>		
<b>Benefits minus cost</b>	<b>\$14,807</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$8,740	\$3,721	\$4,611	\$0	\$17,072
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$755)	(\$755)
<b>Totals</b>	<b>\$8,740</b>	<b>\$3,721</b>	<b>\$4,611</b>	<b>(\$755)</b>	<b>\$16,317</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

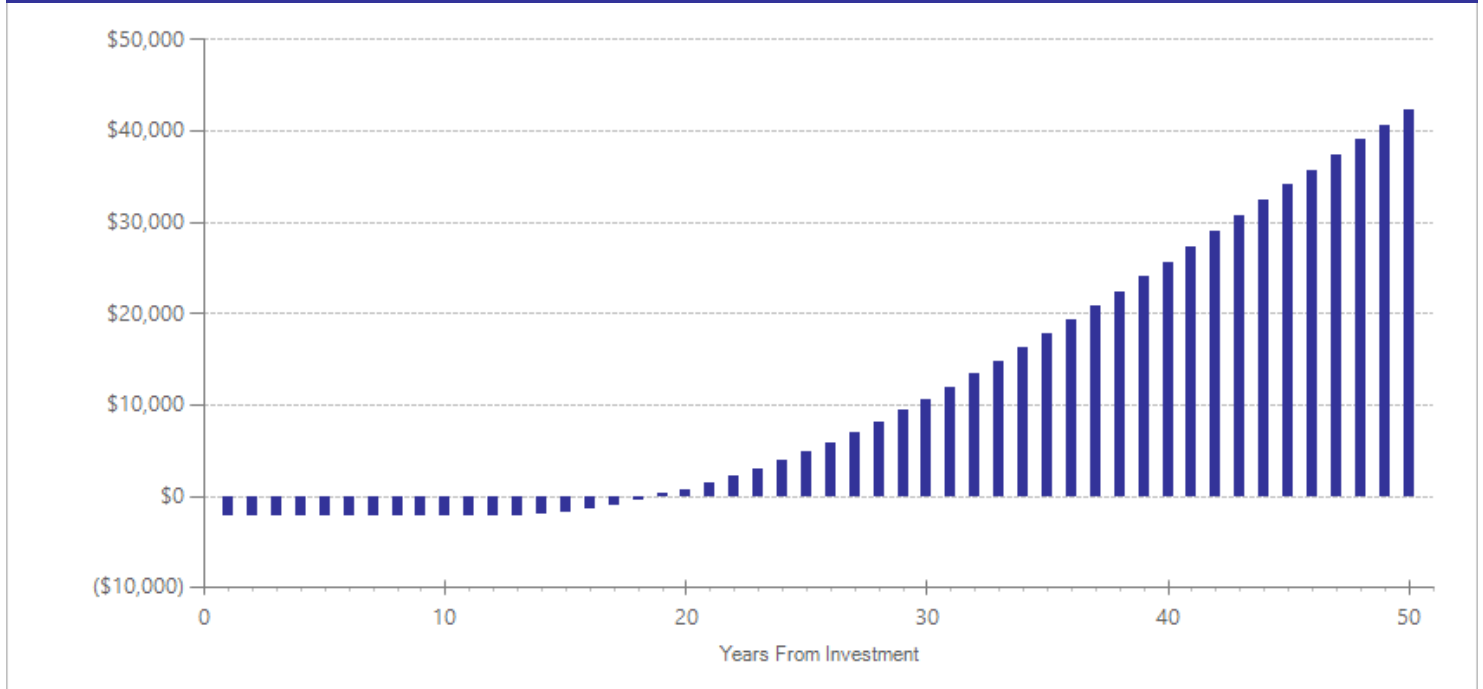
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$2,612	2009	Present value of net program costs (in 2018 dollars)	(\$1,510)
Comparison costs	\$1,298	2009	Cost range (+ or -)	20 %

Per-participant cost estimates are based on the following assumptions derived from the programs described in the studies included in the meta-analysis: on average, the programs lasted for 4.5 months, with 60 tutoring sessions of about 25 minutes each. The programs provided one to three hours of teacher training. We used average teacher salaries (including benefits) in Washington State to compute the value of tutors' time. We assumed that tutoring costs are in addition to regular classroom instruction, for which the cost estimate reflects the sum of local, state, and federal dollars allocated per-student (averaged across Washington State school districts) for the 2008-09 school year. We estimated the uncertainty around the cost estimate at 20%. Source for dollars allocated per student from Washington's Office of Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
Test scores	6	4	114	0.155	0.163	10	0.102	0.179	17	0.183	0.264

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Tutoring: By certificated teachers, small-group, structured Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: The programs included in this analysis are structured, systematic approaches to tutoring small-groups of struggling students in grades K–6 in specific English language arts and/or mathematics skills. The evaluated programs include a variety of specific approaches and curricula such as (in no particular order) Read Aloud, Proactive Reading, Responsive Reading, Leveled Literacy, Spell Read, Corrective Reading, and Number Rockets. An average program provides about 40 hours of tutoring time to groups of two to six (usually three) early elementary students. Certificated teachers provide tutoring and receive about 35 hours of training with a focus on the specific content and strategies used in the programs.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,656	Benefit to cost ratio	\$10.68
Participants	\$8,589	Benefits minus costs	\$14,525
Others	\$4,531	Chance the program will produce	
Indirect	(\$750)	benefits greater than the costs	97 %
<b>Total benefits</b>	<b>\$16,025</b>		
<b>Net program cost</b>	<b>(\$1,500)</b>		
<b>Benefits minus cost</b>	<b>\$14,525</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$8,589	\$3,656	\$4,531	\$0	\$16,776
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$750)	(\$750)
<b>Totals</b>	<b>\$8,589</b>	<b>\$3,656</b>	<b>\$4,531</b>	<b>(\$750)</b>	<b>\$16,025</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

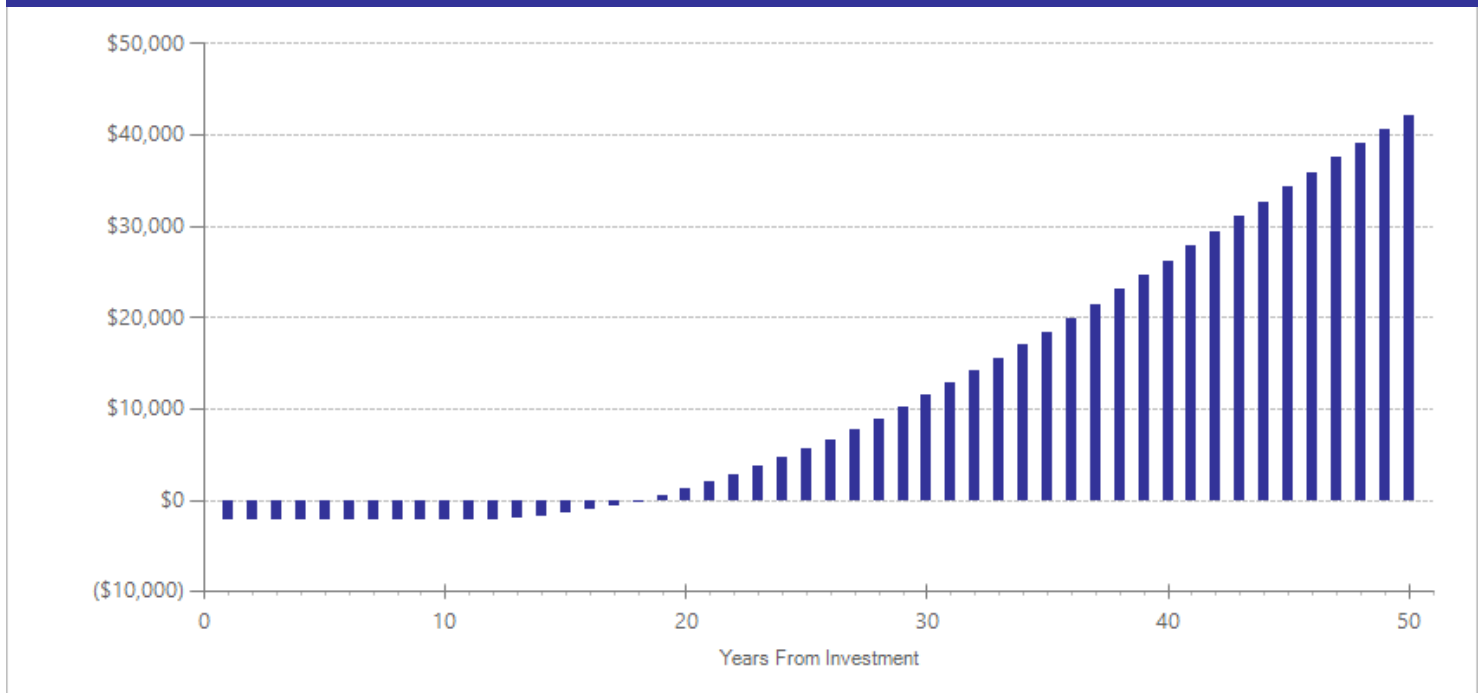
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$1,406	2013	Present value of net program costs (in 2018 dollars)	(\$1,500)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in this meta-analysis, a certificated teacher provides, on average, 40 hours of tutoring to nine students per year in groups of three and receives 35 hours of training. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction, divided by the total number of students served.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	7	14	1649	0.209	0.039	7	0.098	0.043	17	0.254	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Consultant teachers: Online coaching Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: Online coaching programs provide professional development support and feedback to classroom teachers in a web-based environment. The program included in this analysis (My Teaching Partner—Secondary) provides teachers with feedback and guidance on methods to improve their interactions with students. In the online coaching program, teachers upload video recordings of class sessions twice per month. Trained teacher consultants review the recordings and provide feedback to teachers online and over the phone.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$2,992	Benefit to cost ratio	\$66.27
Participants	\$7,029	Benefits minus costs	\$13,421
Others	\$3,708	Chance the program will produce	
Indirect	(\$103)	benefits greater than the costs	93 %
<b>Total benefits</b>	<b>\$13,626</b>		
<b>Net program cost</b>	<b>(\$206)</b>		
<b>Benefits minus cost</b>	<b>\$13,421</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$7,029	\$2,992	\$3,708	\$0	\$13,729
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$103)	(\$103)
<b>Totals</b>	<b>\$7,029</b>	<b>\$2,992</b>	<b>\$3,708</b>	<b>(\$103)</b>	<b>\$13,626</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

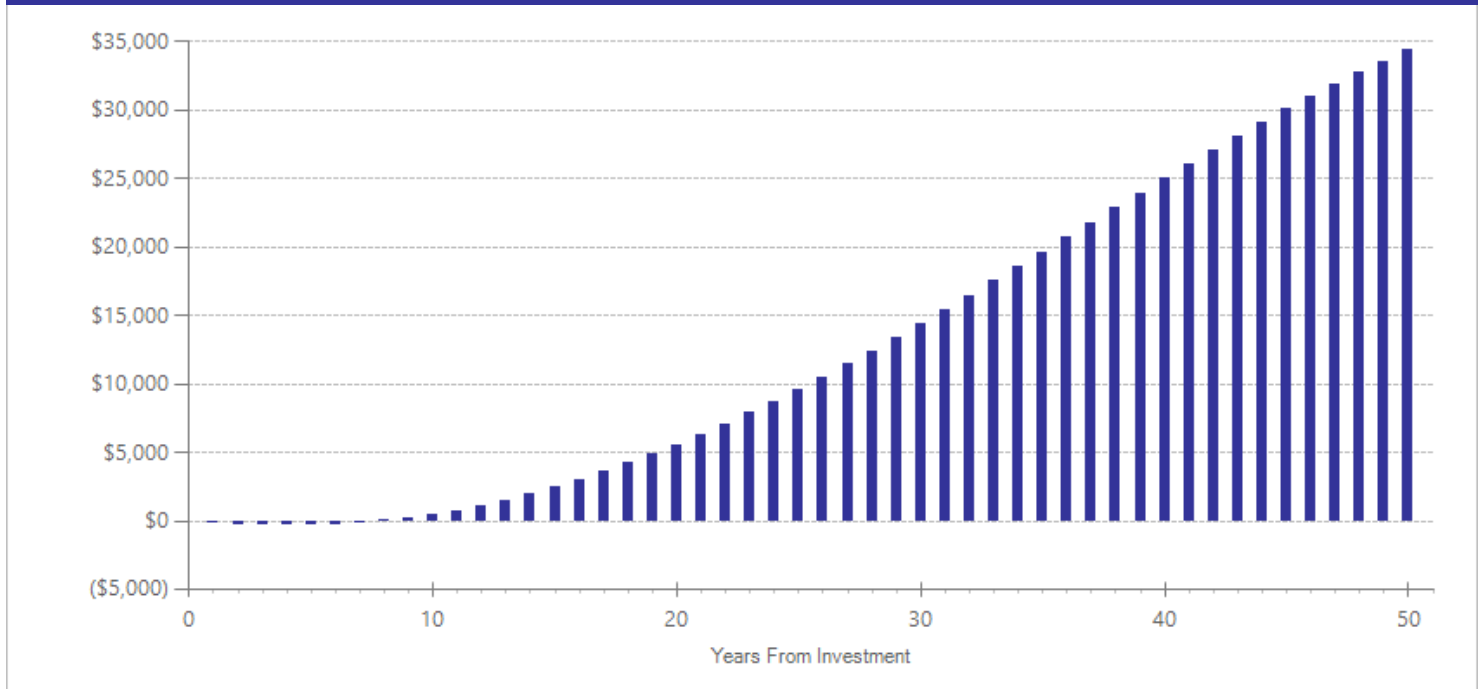
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$98	2013	Present value of net program costs (in 2018 dollars)	(\$206)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluation included this analysis, teachers participated in an average of 20 hours of training and coaching time. We calculated the value of staff time using average Washington State compensation costs (including benefits) for teachers as reported by the Office of the Superintendent of Public Instruction. We added additional costs reported in the evaluation to account for consultant time and video equipment. To calculate a per-student annual cost, we used the average number of students per classroom in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	13	2	1078	0.082	0.043	14	0.071	0.048	17	0.190	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Tutoring: By adults, one-on-one, structured Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: The programs included in this analysis are structured, systematic approaches to tutoring struggling students in specific English language arts and/or mathematics skills. They include a variety of specific programs and curricula such as (in no particular order) Reading Recovery, Mathematics Recovery, Edmark Reading Program, Howard Street Tutoring, and Early Intervention Program. The programs typically serve early elementary school students and provide, on average, about 30 hours of tutoring time to an individual student each year. Tutors are typically certificated teachers or specially trained adults (e.g. instructional aides and community volunteers). Tutors receive approximately ten hours of training per year with a focus on the specific content and general tutoring strategies.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,692	Benefit to cost ratio	\$6.43
Participants	\$8,673	Benefits minus costs	\$13,274
Others	\$4,575	Chance the program will produce	
Indirect	(\$1,222)	benefits greater than the costs	95 %
<b>Total benefits</b>	<b>\$15,719</b>		
<b>Net program cost</b>	<b>(\$2,445)</b>		
<b>Benefits minus cost</b>	<b>\$13,274</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$8,673	\$3,692	\$4,575	\$0	\$16,941
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$1,222)	(\$1,222)
<b>Totals</b>	<b>\$8,673</b>	<b>\$3,692</b>	<b>\$4,575</b>	<b>(\$1,222)</b>	<b>\$15,719</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

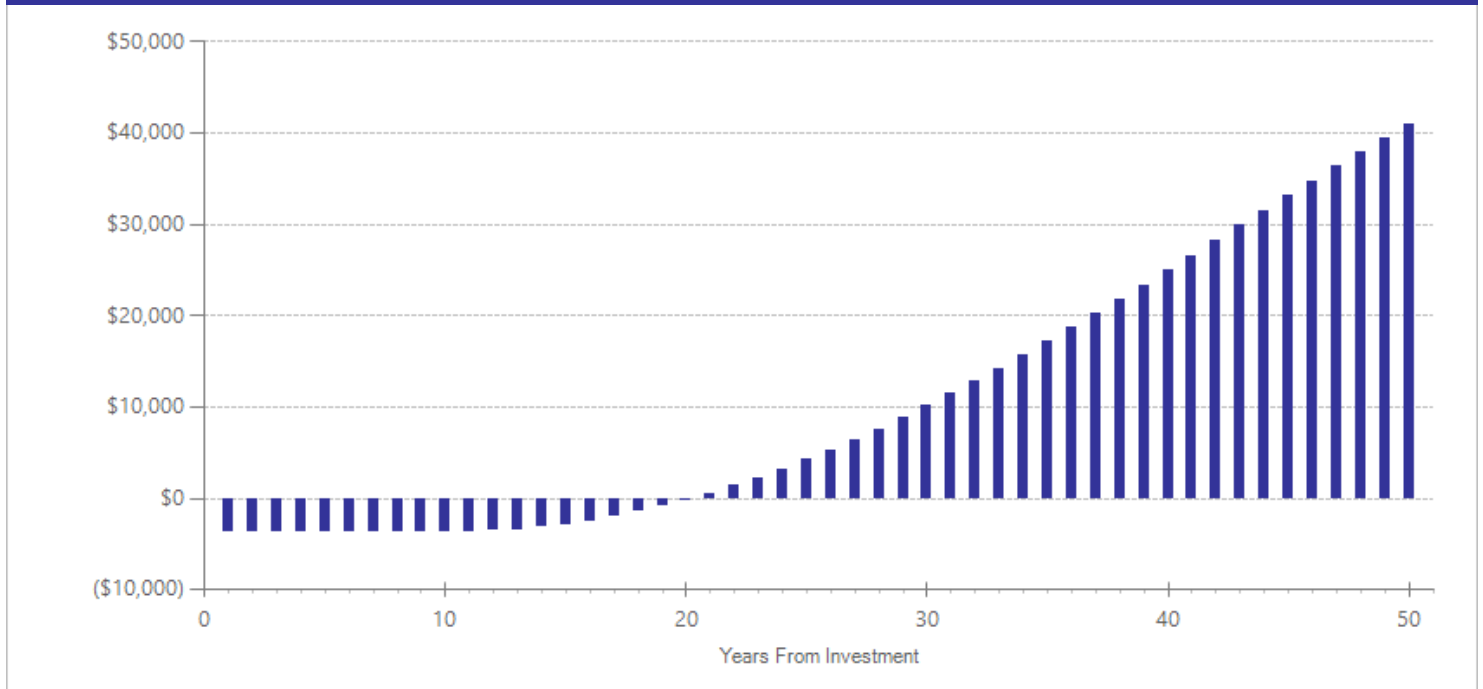
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$2,291	2013	Present value of net program costs (in 2018 dollars)	(\$2,445)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, the average structured one-on-one tutoring program provides 30 hours of intervention per student and ten hours of training time per tutor. The estimates assume that both certificated teachers and other adults (e.g. instructional aides) provide tutoring. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for K-8 teachers and instructional aides as reported by the Office of the Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	7	23	2097	0.211	0.038	7	0.099	0.042	17	0.508	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.



An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Project Lead The Way (PLTW)

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated September 2014.

Program Description: Project Lead the Way (PLTW) is an example of project-based learning focused on science, technology, engineering, and mathematics (STEM) education. PLTW is a nonprofit organization that develops engineering courses for high schools and middle schools and biomedical sciences courses for high schools. The curriculum is delivered through an online “virtual academy.” Computer software and classroom materials for hands-on activities, as well as required teacher training, are the main costs related to the program. We present the findings for math scores here.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,463	Benefit to cost ratio	\$8.04
Participants	\$8,135	Benefits minus costs	\$13,099
Others	\$4,292	Chance the program will produce	
Indirect	(\$930)	benefits greater than the costs	83 %
<b>Total benefits</b>	<b>\$14,960</b>		
<b>Net program cost</b>	<b>(\$1,861)</b>		
<b>Benefits minus cost</b>	<b>\$13,099</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$8,135	\$3,463	\$4,292	\$0	\$15,890
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$930)	(\$930)
<b>Totals</b>	<b>\$8,135</b>	<b>\$3,463</b>	<b>\$4,292</b>	<b>(\$930)</b>	<b>\$14,960</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

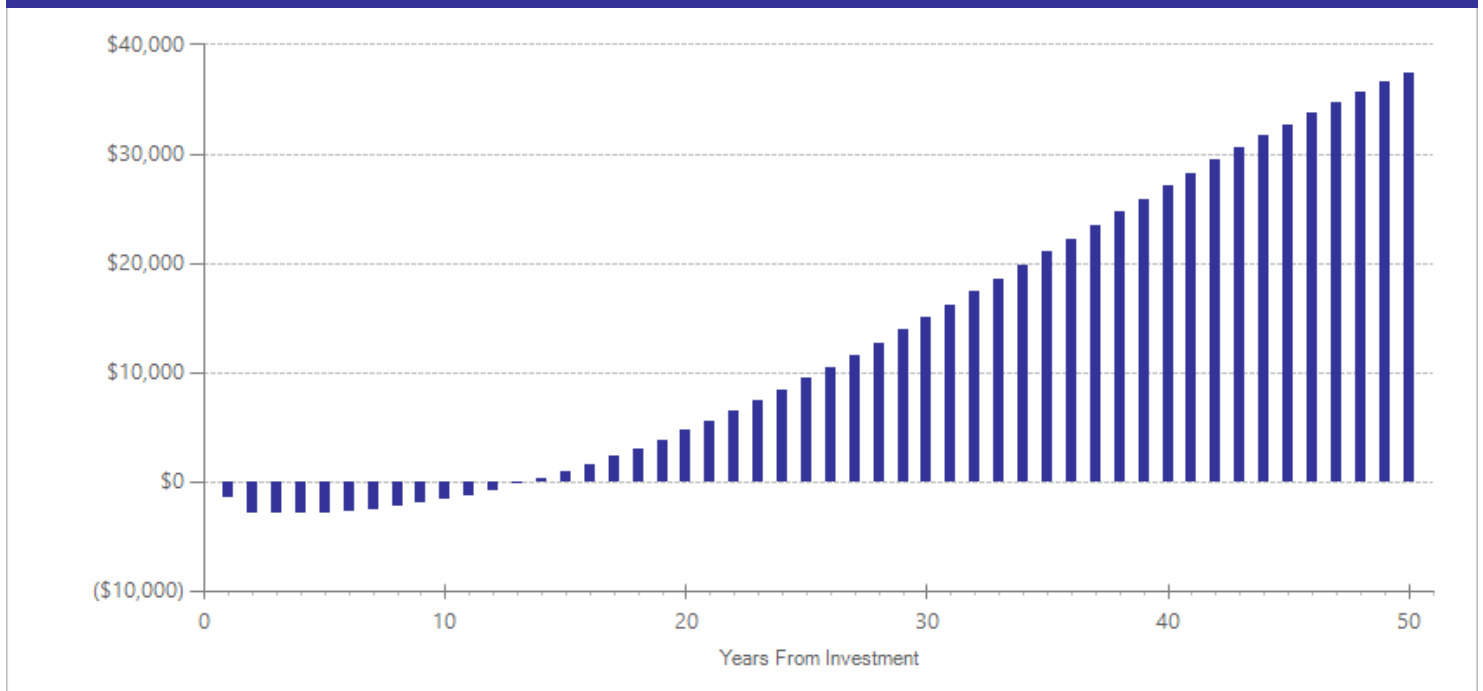
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$887	2013	Present value of net program costs (in 2018 dollars)	(\$1,861)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

The per-student cost estimate assumes that a participating school would offer four sections of PLTW per year with no more than 20 students per class. Students in the evaluated studies typically participated for two years. We calculate the value of teacher time to participate in training and teach courses using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. The estimate includes an annual participation fee, training costs, and supply costs for course set-up and consumable materials obtained from PLTW (<https://www.pltw.org/get-involved/register-pltw/program-support/equipment-and-supplies>).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	14	5	9319	0.084	0.060	16	0.081	0.066	17	0.084	0.160

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Head Start Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated July 2019.

Program Description: Head Start is a federal program that funds early childhood education, social services, and health services for low-income children ages 0-5 to support child development and learning. Studies in this analysis focus on preschool Head Start programs for children ages 3-5 years old. Head Start offers half- and full-day programs that typically last during the school year.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$7,588	Benefit to cost ratio	\$2.42
Participants	\$9,914	Benefits minus costs	\$12,481
Others	\$6,611	Chance the program will produce	
Indirect	(\$2,831)	benefits greater than the costs	70 %
<b>Total benefits</b>	<b>\$21,281</b>		
<b>Net program cost</b>	<b>(\$8,800)</b>		
<b>Benefits minus cost</b>	<b>\$12,481</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

#### Benefits from changes to:<sup>1</sup>

#### Benefits to:

	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$1,218	\$2,731	\$609	\$4,558
Labor market earnings associated with high school graduation	\$7,353	\$3,131	\$4,011	\$0	\$14,495
K-12 grade repetition	\$0	\$138	\$0	\$69	\$208
K-12 special education	\$0	\$2,385	\$0	\$1,193	\$3,578
Health care associated with externalizing behavior symptoms	\$16	\$57	\$59	\$29	\$161
Health care associated with internalizing symptoms	(\$2)	(\$7)	(\$7)	(\$4)	(\$20)
Labor market earnings associated with obesity	\$0	\$0	\$0	\$0	\$0
Costs of higher education	(\$557)	(\$656)	(\$183)	(\$328)	(\$1,723)
Mortality associated with depression	\$0	\$0	\$0	\$1	\$1
Mortality associated with obesity	\$0	\$0	\$0	\$0	\$0
<b>Subtotals</b>	<b>\$6,811</b>	<b>\$6,267</b>	<b>\$6,611</b>	<b>\$1,569</b>	<b>\$21,258</b>
From secondary participant					
Labor market earnings	\$3,103	\$1,321	\$0	\$0	\$4,424
<b>Subtotals</b>	<b>\$3,103</b>	<b>\$1,321</b>	<b>\$0</b>	<b>\$0</b>	<b>\$4,424</b>
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$4,400)	(\$4,400)
<b>Totals</b>	<b>\$9,914</b>	<b>\$7,588</b>	<b>\$6,611</b>	<b>(\$2,831)</b>	<b>\$21,281</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

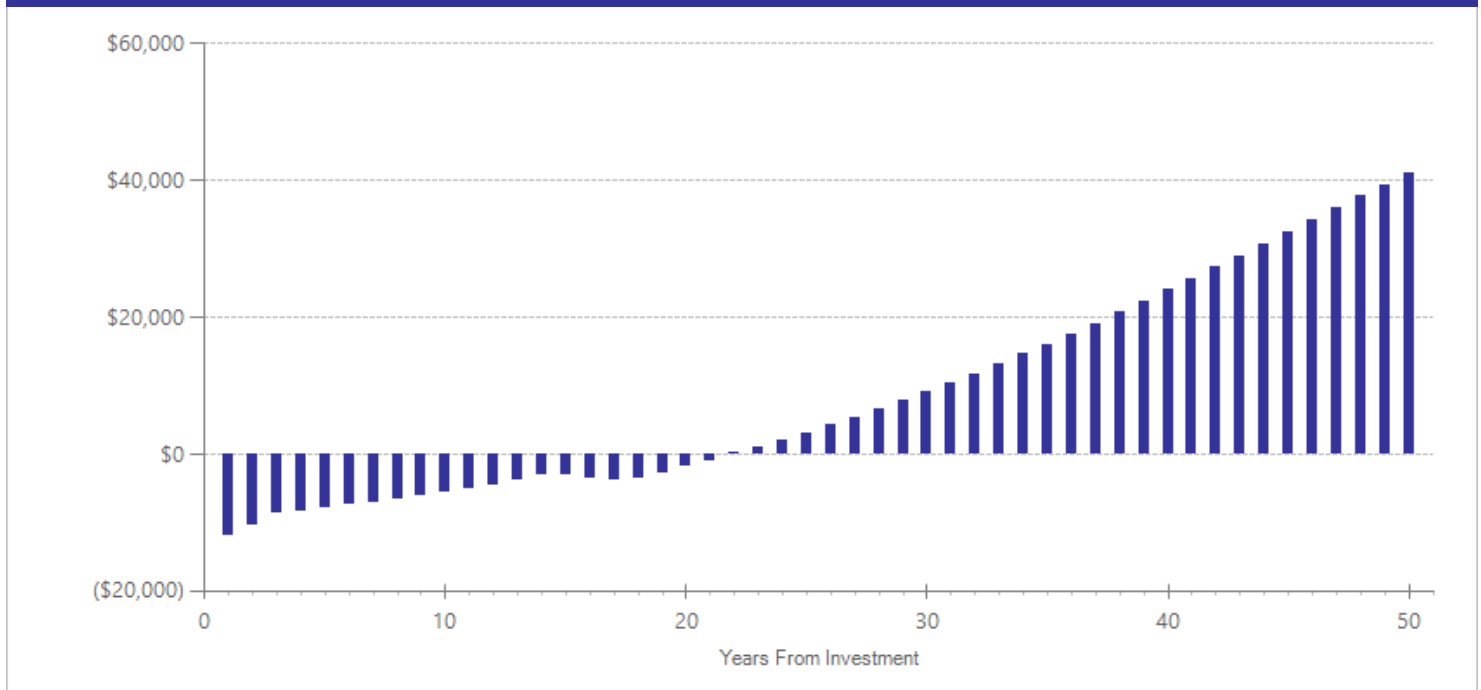
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$13,550	2018	Present value of net program costs (in 2018 dollars)	(\$8,800)
Comparison costs	\$4,750	2018	Cost range (+ or -)	20 %

The costs of Head Start participation are calculated by dividing the total federal funding by the total enrollment in Washington in 2019. The costs of Head Start participation were provided by T. Saenz-Thompson (personal communication, Office of Head Start Region 10, October 24, 2019). The comparison group consists of children receiving state-funded pre-kindergarten services, state-funded childcare subsidies, or children receiving no state-funded care. Costs for these children are estimated from Washington's Early Childhood Education Assistance Program (ECEAP) for low-income preschoolers (2018-19 ECEAP Caseload Forecast Report December 2018 [https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP\\_Caseload\\_Forecast.pdf](https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP_Caseload_Forecast.pdf)) and Washington's childcare subsidy reimbursement rates as of February 2019 (<https://www.dcyf.wa.gov/node/1640>). Comparison group costs are a weighted average of the costs in pre-kindergarten, state subsidized childcare, and no state-funded care.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	Primary or secondary participant	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
					First time ES is estimated			Second time ES is estimated			ES	p-value
					ES	SE	Age	ES	SE	Age		
Alcohol use before end of middle school <sup>^^</sup>	4	Primary	1	634	-0.211	0.069	12	-0.211	0.069	23	-0.211	0.002
Smoking before end of middle school <sup>^^</sup>	4	Primary	1	634	-0.131	0.072	12	-0.131	0.072	23	-0.131	0.070
Illicit drug use before end of middle school <sup>^^</sup>	4	Primary	1	634	0.116	0.091	12	0.116	0.091	23	0.116	0.201
Youth binge drinking <sup>^^</sup>	4	Primary	1	584	-0.096	0.078	16	-0.096	0.078	27	-0.096	0.218
Employment <sup>^^</sup>	4	Primary	1	461	-0.157	0.099	20	0.000	0.000	0	-0.157	0.114
Suspensions/expulsions <sup>^</sup>	4	Primary	1	263	0.064	0.093	13	0.000	0.000	0	0.064	0.490
Social and emotional development <sup>^</sup>	4	Primary	4	4158	0.012	0.039	7	0.000	0.000	0	0.012	0.749
School attendance <sup>^</sup>	4	Primary	1	214	0.080	0.075	13	0.000	0.000	0	0.080	0.288
Grade point average <sup>^</sup>	4	Primary	1	255	0.012	0.071	13	0.000	0.000	0	0.012	0.868
Enroll in any college <sup>^</sup>	4	Primary	4	1658	-0.071	0.051	25	0.000	0.000	0	-0.071	0.163
GED attainment <sup>^</sup>	29	Secondary	2	1775	0.062	0.043	31	0.000	0.000	0	0.062	0.148
Graduate with any degree <sup>^</sup>	29	Secondary	2	1775	0.088	0.089	31	0.000	0.000	0	0.088	0.321
Crime	4	Primary	3	988	-0.144	0.137	19	-0.144	0.137	27	-0.144	0.295
Externalizing behavior symptoms	4	Primary	7	6203	-0.030	0.026	8	-0.016	0.017	11	-0.030	0.258
High school graduation	4	Primary	4	1485	0.126	0.069	18	0.126	0.069	19	0.126	0.069
Internalizing symptoms	4	Primary	2	1905	0.013	0.048	8	0.013	0.048	11	0.013	0.784
K-12 grade repetition	4	Primary	6	2848	-0.122	0.063	13	-0.122	0.063	13	-0.122	0.051
K-12 special education	4	Primary	4	1734	-0.112	0.101	14	-0.112	0.101	14	-0.112	0.268
Major depressive disorder	4	Primary	1	526	-0.190	0.062	15	0.000	0.310	19	-0.190	0.002
Obesity	4	Primary	2	1419	0.124	0.157	6	0.000	0.101	9	0.124	0.430
Teen births under age 18	4	Primary	2	824	-0.126	0.253	17	-0.126	0.253	17	-0.126	0.619
Test scores	4	Primary	7	6046	0.129	0.029	5	0.040	0.032	17	0.129	0.001
Employment	29	Secondary	2	1775	0.079	0.094	31	0.000	0.000	32	0.079	0.401

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

<sup>^^</sup>WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Consultant teachers: Content-Focused Coaching Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2018.

Program Description: Content-Focused Coaching is a professional development model that provides structured training to administrators, coaches, and teachers in order to improve instructional practices and student outcomes. The program provides training for school coaches and principals led by staff from the University of Pittsburgh's Institute for Learning. Coaches, in turn, provide professional development and one-on-one feedback to classroom teachers with a focus on specific reading comprehension strategies. The evaluation included in this analysis compared the effects of Content-Focused Coaching to coaching-as-usual.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$2,489	Benefit to cost ratio	\$187.29
Participants	\$5,848	Benefits minus costs	\$11,331
Others	\$3,085	Chance the program will produce	
Indirect	(\$30)	benefits greater than the costs	94 %
<b>Total benefits</b>	<b>\$11,392</b>		
<b>Net program cost</b>	<b>(\$61)</b>		
<b>Benefits minus cost</b>	<b>\$11,331</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$5,848	\$2,489	\$3,085	\$0	\$11,422
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$30)	(\$30)
<b>Totals</b>	<b>\$5,848</b>	<b>\$2,489</b>	<b>\$3,085</b>	<b>(\$30)</b>	<b>\$11,392</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

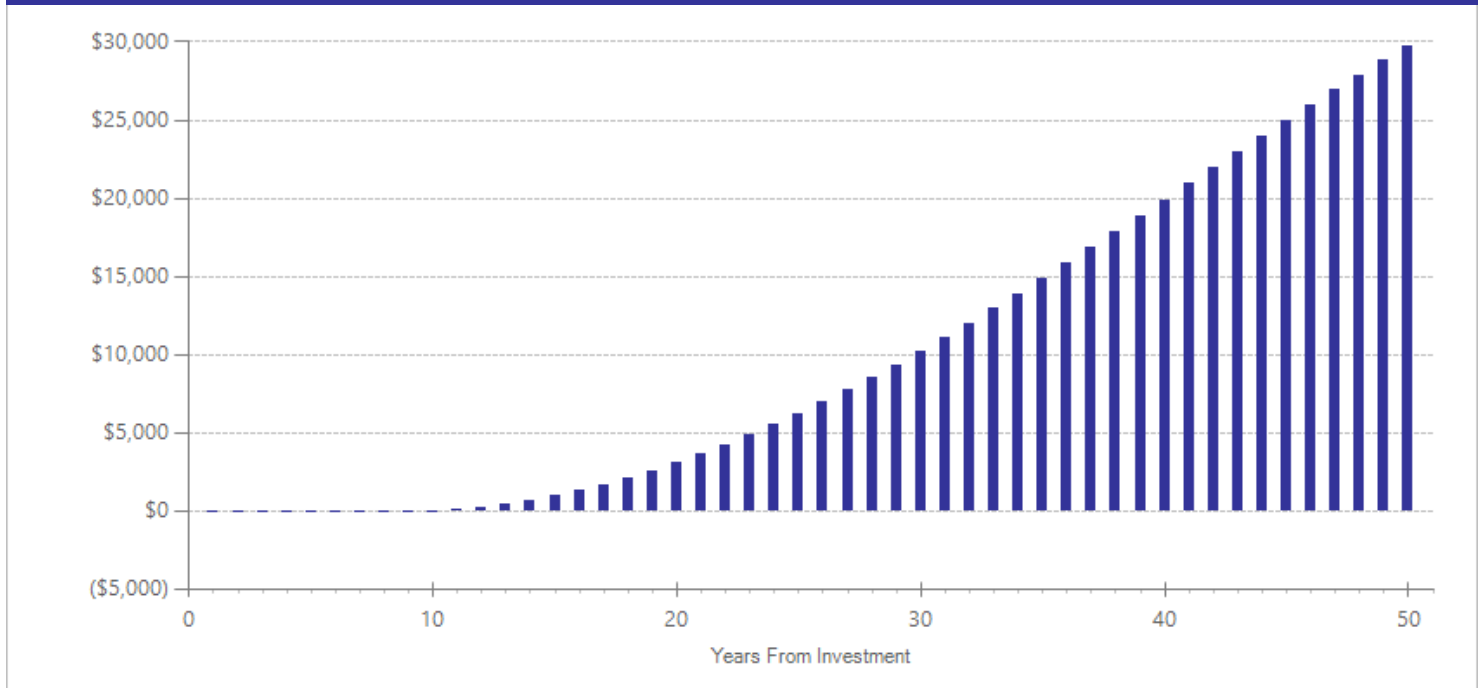
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$299	2013	Present value of net program costs (in 2018 dollars)	(\$61)
Comparison costs	\$242	2013	Cost range (+ or -)	10 %

Content-Focused Coaching provides additional training time for principals, coaches, and teachers beyond the usual amount of time in other coaching programs. We calculated the cost of Content-Focused Coaching by adding this additional time to the WSIPP estimate for coaching-as-usual based on the framework described in Knight, D.S. (2012). Assessing the cost of instructional coaching. *Journal of Education Finance*, 38(1), 52-80. The estimate is based on one-full time coach per school at the average compensation cost (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction. In addition, the estimate includes costs related to administrator time, materials, professional development, and classroom teacher time to work with coaches. To calculate a per-student annual cost, we used the average number of students per school in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	9	1	1543	0.107	0.037	9	0.064	0.041	17	0.250	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

Matsumura, L.C., Garnier, H.E., & Spybrook, J. (2013). Literacy coaching to improve student reading achievement: A multi-level mediation model. *Learning and Instruction, 25*(1), 35-48.

# Special literacy instruction for English language learner students

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated July 2014.

Program Description: English-based literacy programs in these evaluations involve a structured, direct instruction approach to teaching reading to English language learner (ELL) students. Some programs include multimedia components such as computer-based instruction. These programs are compared with literacy instruction-as-usual after about three years of schooling. Instruction is provided in a classroom setting during the regular school day.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$2,540	Benefit to cost ratio	\$36.88
Participants	\$5,967	Benefits minus costs	\$11,186
Others	\$3,147	Chance the program will produce	
Indirect	(\$156)	benefits greater than the costs	81 %
<b>Total benefits</b>	<b>\$11,498</b>		
<b>Net program cost</b>	<b>(\$312)</b>		
<b>Benefits minus cost</b>	<b>\$11,186</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$5,967	\$2,540	\$3,147	\$0	\$11,654
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$156)	(\$156)
<b>Totals</b>	<b>\$5,967</b>	<b>\$2,540</b>	<b>\$3,147</b>	<b>(\$156)</b>	<b>\$11,498</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

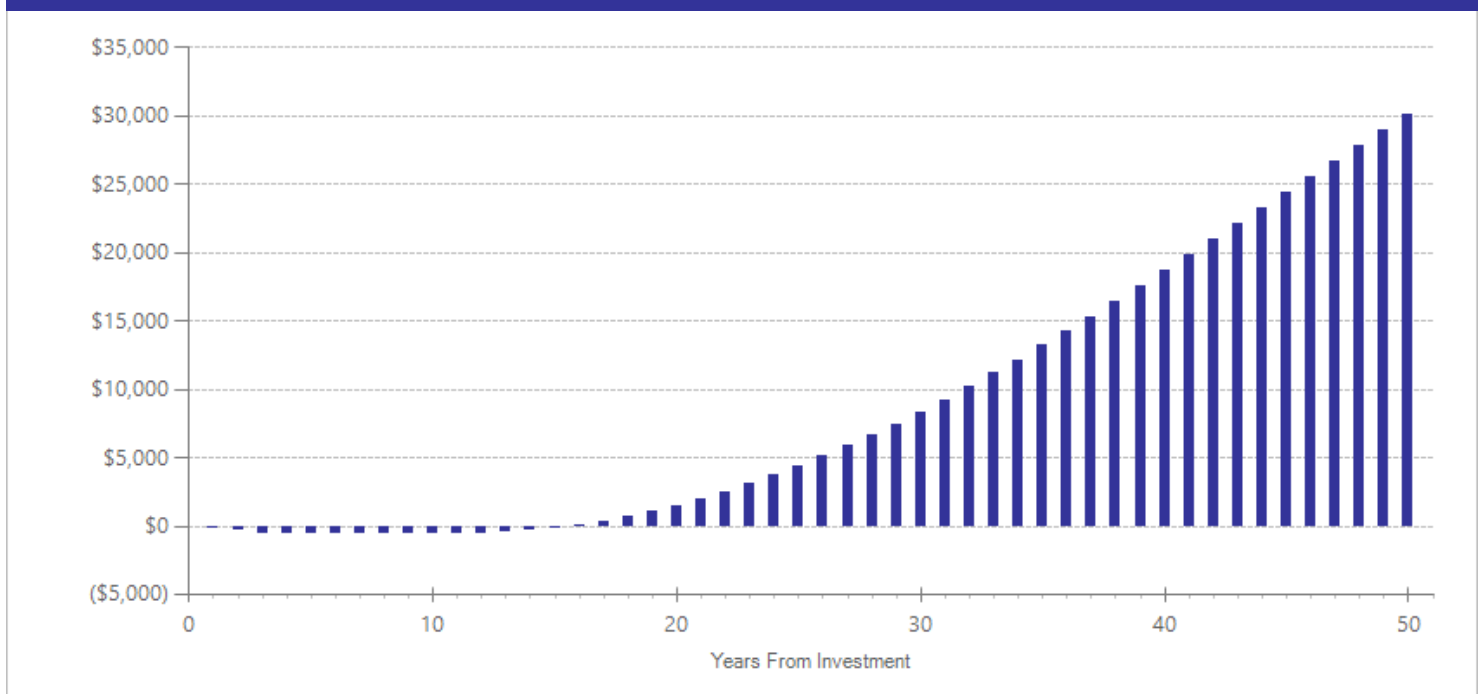
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$1,398	2009	Present value of net program costs (in 2018 dollars)	(\$312)
Comparison costs	\$1,298	2009	Cost range (+ or -)	20 %

The per-participant cost estimate reflects the sum of local, state, and federal dollars allocated per student (averaged across Washington State school districts) for the 2008-09 school year. All students who qualify for the state Transitional Bilingual Instructional Program (TBIP) receive some form of services, so the comparison group's general instructional costs are the same as for the program group. Because specialized literacy programs may require supplemental materials and training, we added \$100 to the cost estimate and estimated the uncertainty around the cost estimate at 20%. Source for dollars allocated per student come from Washington's Office of Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	6	6	423	0.148	0.069	7	0.070	0.076	17	0.306	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## State early childhood education programs: Low-income Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated July 2019.

Program Description: To be considered a pre-kindergarten program, the program must have had an age requirement of three or four at the start of the program and an education focus. This analysis includes studies of children attending a state- or district-funded pre-kindergarten programs that target low-income students after 1975. Programs examined offered ECE services on a part-time and/or full-time basis. Comparison students may have received child care provided by family or non-family members, another preschool program, or Head Start.

We exclude programs that provided childcare subsidies, focused on the provision of general childcare, focused on parent and child development, and/or provided more extensive wraparound services.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$2,938	Benefit to cost ratio	\$4.33
Participants	\$7,468	Benefits minus costs	\$9,805
Others	\$3,939	Chance the program will produce	
Indirect	(\$1,594)	benefits greater than the costs	91 %
<b>Total benefits</b>	<b>\$12,751</b>		
<b>Net program cost</b>	<b>(\$2,946)</b>		
<b>Benefits minus cost</b>	<b>\$9,805</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$7,468	\$3,179	\$3,939	\$0	\$14,586
K-12 grade repetition	\$0	\$51	\$0	\$26	\$77
K-12 special education	\$0	(\$293)	\$0	(\$146)	(\$439)
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$1,473)	(\$1,473)
<b>Totals</b>	<b>\$7,468</b>	<b>\$2,938</b>	<b>\$3,939</b>	<b>(\$1,594)</b>	<b>\$12,751</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

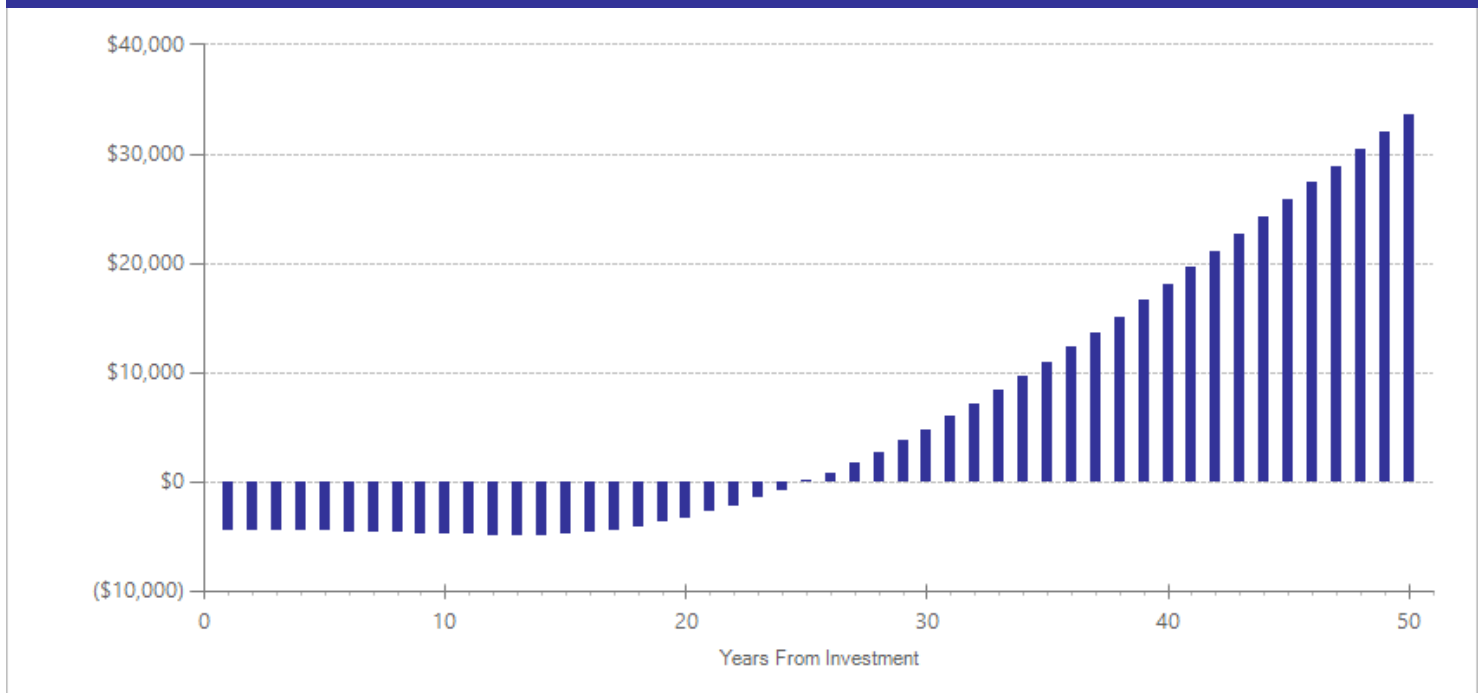
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$9,330	2018	Present value of net program costs (in 2018 dollars)	(\$2,946)
Comparison costs	\$6,384	2018	Cost range (+ or -)	25 %

The cost of participation in early childhood education programs targeting low-income children are estimated from Washington's Early Childhood Education Assistance Program (ECEAP) for low-income preschoolers (2019-20 ECEAP Contractor Slots, Models, Overincome Allotments, and Funding [https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP\\_Contractor\\_slots\\_models\\_funding.pdf](https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP_Contractor_slots_models_funding.pdf)). The comparison group cost consists of an estimate of all ECEAP/Head Start-eligible children in Washington who are participating in Head Start, receiving state-funded childcare subsidies, or receiving no state-funded care. The cost of Head Start participation was provided by T. Saenz-Thompson (personal communication, Office of Head Start Region 10, October 24, 2019). The cost of receiving state-funded childcare subsidies is based on Washington's childcare subsidy reimbursement rates as of February 2019 (<https://www.dcyf.wa.gov/node/1640>). The comparison group cost is a weighted average of the cost of Head Start, state-subsidized childcare, and no state-funded care.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.



## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
K-12 grade repetition	4	3	274591	-0.043	0.004	8	-0.043	0.004	8	-0.043	0.001
K-12 special education	4	3	274605	0.013	0.046	8	0.013	0.046	8	0.013	0.778
Office discipline referrals <sup>^</sup>	4	1	1852	0.033	0.078	8	n/a	n/a	n/a	0.033	0.672
School attendance <sup>^</sup>	4	1	1852	-0.032	0.056	8	n/a	n/a	n/a	-0.032	0.572
Test scores	4	6	4615	0.293	0.022	5	0.091	0.025	17	0.293	0.001

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Tutoring: By non-certificated adults, small-group, structured Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: The programs included in this analysis are structured, systematic approaches to tutoring small-groups of struggling students in grades K–4 in specific English language arts and/or mathematics skills. The evaluated programs include a variety of specific programs and curricula such as (in no particular order) Quick Reads, Gottshall Early Reading Intervention, and Hot Math. The evaluated tutoring programs provide, on average, 22 hours of tutoring time to groups of two to six (usually three) early elementary students. Tutors are typically instructional aides or college student volunteers who receive 20 hours of training each year. Certificated teachers provide oversight and planning support.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$2,204	Benefit to cost ratio	\$17.18
Participants	\$5,178	Benefits minus costs	\$9,256
Others	\$2,731	Chance the program will produce	
Indirect	(\$286)	benefits greater than the costs	78 %
<u>Total benefits</u>	<u>\$9,828</u>		
<u>Net program cost</u>	<u>(\$572)</u>		
Benefits minus cost	\$9,256		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$5,178	\$2,204	\$2,731	\$0	\$10,113
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$286)	(\$286)
<b>Totals</b>	<b>\$5,178</b>	<b>\$2,204</b>	<b>\$2,731</b>	<b>(\$286)</b>	<b>\$9,828</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

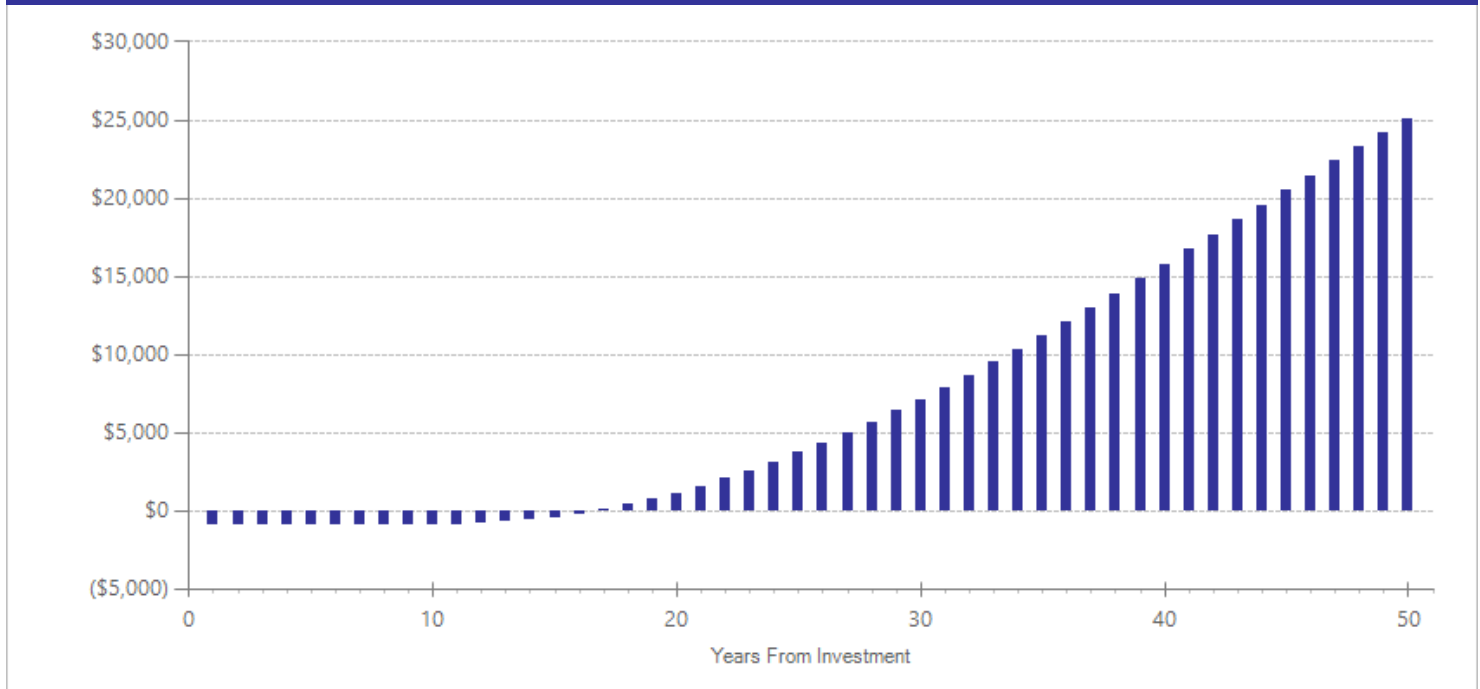
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$536	2013	Present value of net program costs (in 2018 dollars)	(\$572)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in this meta-analysis, a non-certificated adult (such as an instructional aide or college student) provides, on average, 22 hours of tutoring to six students per year in groups of three and receives 20 hours of training. A certificated teacher provides six hours of planning support and oversight per group. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for K-8 teachers and instructional aides as reported by the Office of the Superintendent of Public Instruction, divided by the total number of students served.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	7	9	611	0.126	0.063	7	0.059	0.069	17	0.318	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Teacher professional development: Targeted Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: Generally, professional development (PD) for K–12 teachers includes activities such as workshops, conferences, summer institutes, and time set aside during the school year for staff development. Targeted PD focuses on improving teaching in a particular content area (such as reading, math, and science) and/or a particular grade level. The specific types of PD evaluated and included in this meta-analysis are (in no particular order) Language Essentials for Teachers of Reading and Spelling (LETRS), Pacific Communities with High Performance in Literacy Development (Pacific CHILD), Cognitively Guided Instruction, Math & Science Partnerships (MSP), Teaching Science, Mathematics and Relevant Technologies (Teaching SMART), Discovery Model Schools Initiative, the Integrated Mathematics Assessment, Teaching Cases, and Metacognitive Analysis. Most forms of targeted PD include a summer institute in addition to training provided during the regular school year.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$2,032	Benefit to cost ratio	\$33.11
Participants	\$4,773	Benefits minus costs	\$8,906
Others	\$2,518	Chance the program will produce	
Indirect	(\$139)	benefits greater than the costs	79 %
<u>Total benefits</u>	<u>\$9,183</u>		
<u>Net program cost</u>	<u>(\$277)</u>		
Benefits minus cost	\$8,906		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$4,773	\$2,032	\$2,518	\$0	\$9,322
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$139)	(\$139)
<b>Totals</b>	<b>\$4,773</b>	<b>\$2,032</b>	<b>\$2,518</b>	<b>(\$139)</b>	<b>\$9,183</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

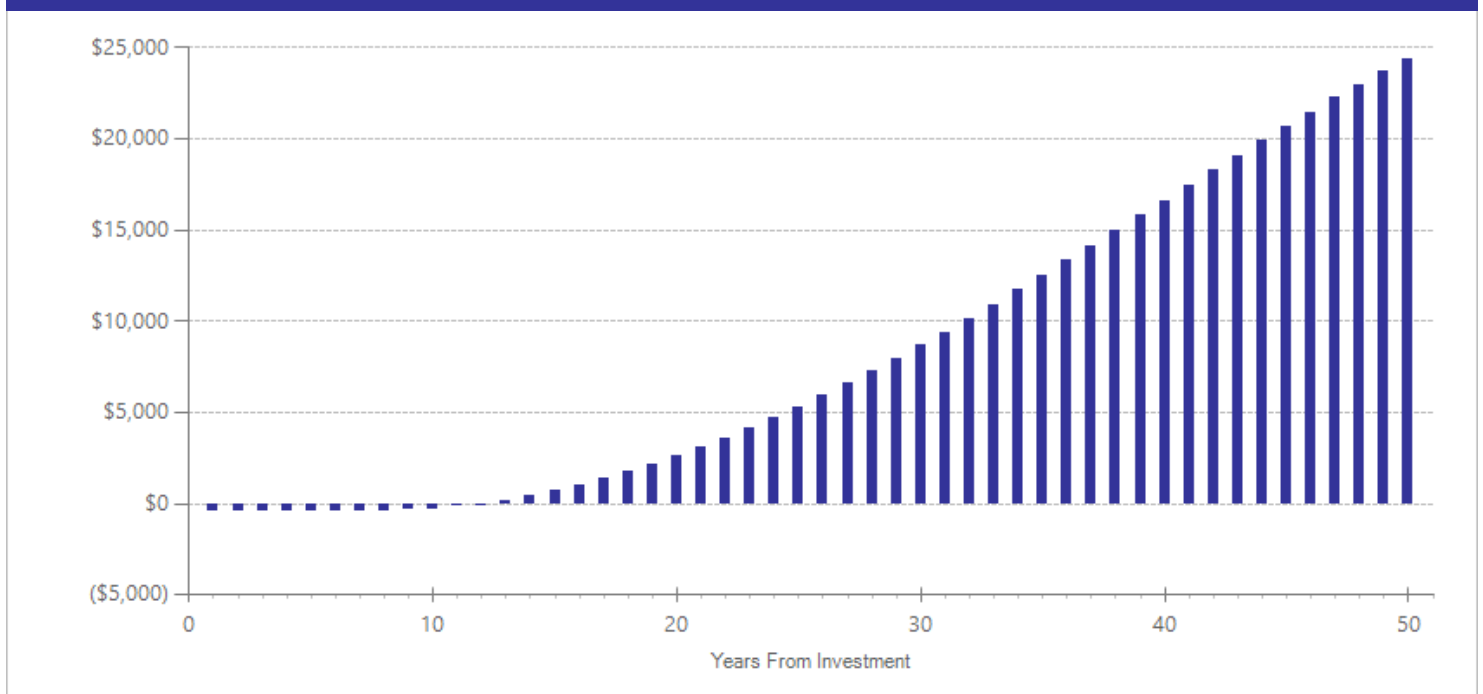
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$260	2013	Present value of net program costs (in 2018 dollars)	(\$277)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, teachers received an average of 63 additional hours of targeted professional development (PD) in comparison with the usual amount of PD time. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs to account for the overhead (i.e. facility and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	14	11652	0.071	0.055	11	0.051	0.060	17	0.198	0.008

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Consultant teachers: Coaching

### Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: Coaching is a form of job-embedded professional development for teachers. Coaching programs (sometimes called literacy coaching, mathematics coaching, or instructional coaching) typically assign a full-time, trained teacher to an individual school to serve as a coach. Generally, coaches work directly with classroom teachers (usually one-on-one or in small groups) to help them improve their instructional strategies. Coaches observe teaching, provide individual feedback, engage in co-teaching sessions, model effective instructional practices, and provide professional development workshops. The studies in this analysis focused on providing coaching to teachers in 2nd-7th grades.

#### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,567	Benefit to cost ratio	\$26.24
Participants	\$3,682	Benefits minus costs	\$6,787
Others	\$1,942	Chance the program will produce	
Indirect	(\$134)	benefits greater than the costs	82 %
<u>Total benefits</u>	<u>\$7,056</u>		
<u>Net program cost</u>	<u>(\$269)</u>		
Benefits minus cost	\$6,787		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

#### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$3,682	\$1,567	\$1,942	\$0	\$7,191
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$134)	(\$134)
Totals	\$3,682	\$1,567	\$1,942	(\$134)	\$7,056

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.



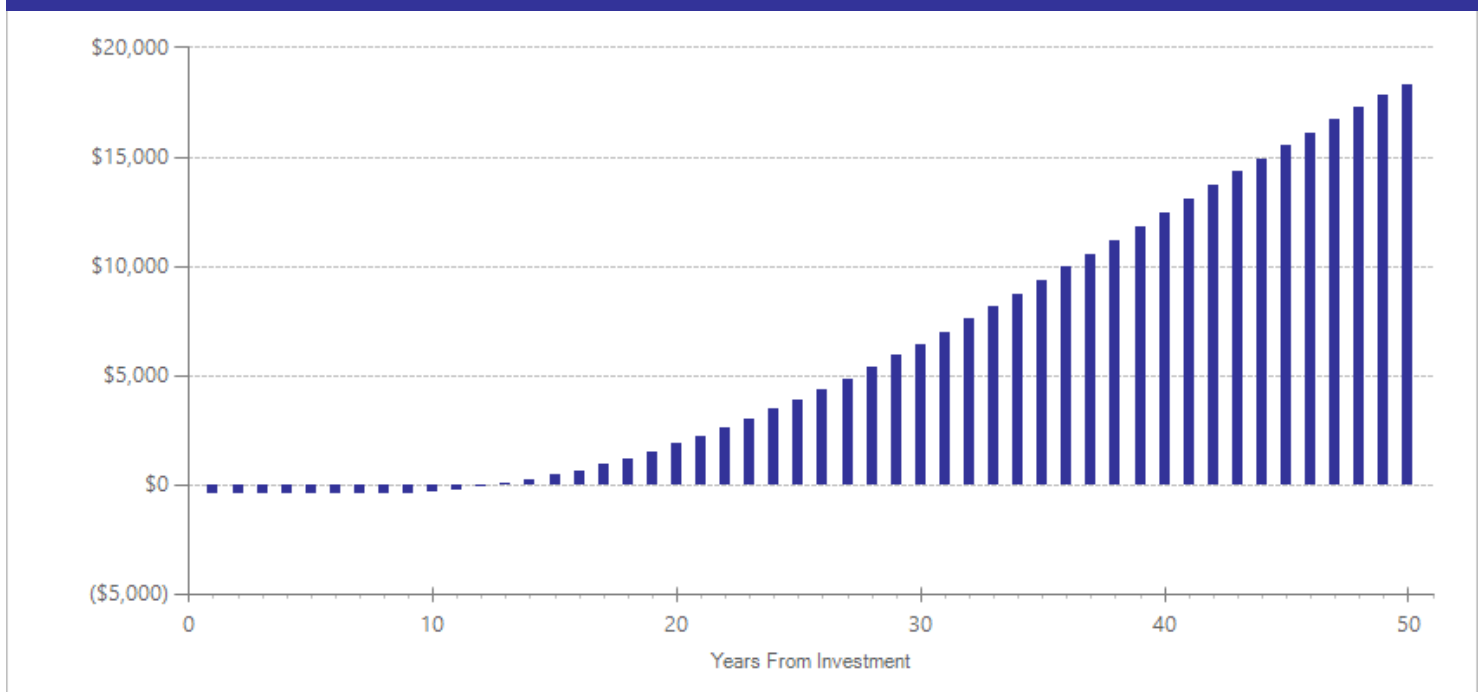
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$252	2013	Present value of net program costs (in 2018 dollars)	(\$269)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

The cost is a WSIPP estimate based on the framework described in Knight, D.S. (2012). Assessing the cost of instructional coaching. *Journal of Education Finance*, 38(1), 52-80. The estimate is based on one-full time coach per school at the average compensation cost (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction. In addition, the estimate includes costs related to administrator time, materials, professional development, and classroom teacher time to work with coaches. To calculate a per-student annual cost, we use the average number of students per school in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	11	12805	0.060	0.037	10	0.040	0.041	17	0.060	0.105

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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# Teacher professional development: Induction/mentoring

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: Teacher induction programs typically assign an experienced teacher-mentor to new teachers in the first and second year of their careers. In more intensive programs, additional support includes professional development opportunities and structured collaboration time with other teachers at the school. The evaluations included in the meta-analysis examine more-intensive programs compared to less-intensive programs.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,306	Benefit to cost ratio	\$75.09
Participants	\$3,068	Benefits minus costs	\$5,873
Others	\$1,618	Chance the program will produce	
Indirect	(\$40)	benefits greater than the costs	63 %
<b>Total benefits</b>	<b>\$5,953</b>		
<b>Net program cost</b>	<b>(\$79)</b>		
<b>Benefits minus cost</b>	<b>\$5,873</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$3,068	\$1,306	\$1,618	\$0	\$5,992
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$40)	(\$40)
<b>Totals</b>	<b>\$3,068</b>	<b>\$1,306</b>	<b>\$1,618</b>	<b>(\$40)</b>	<b>\$5,953</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

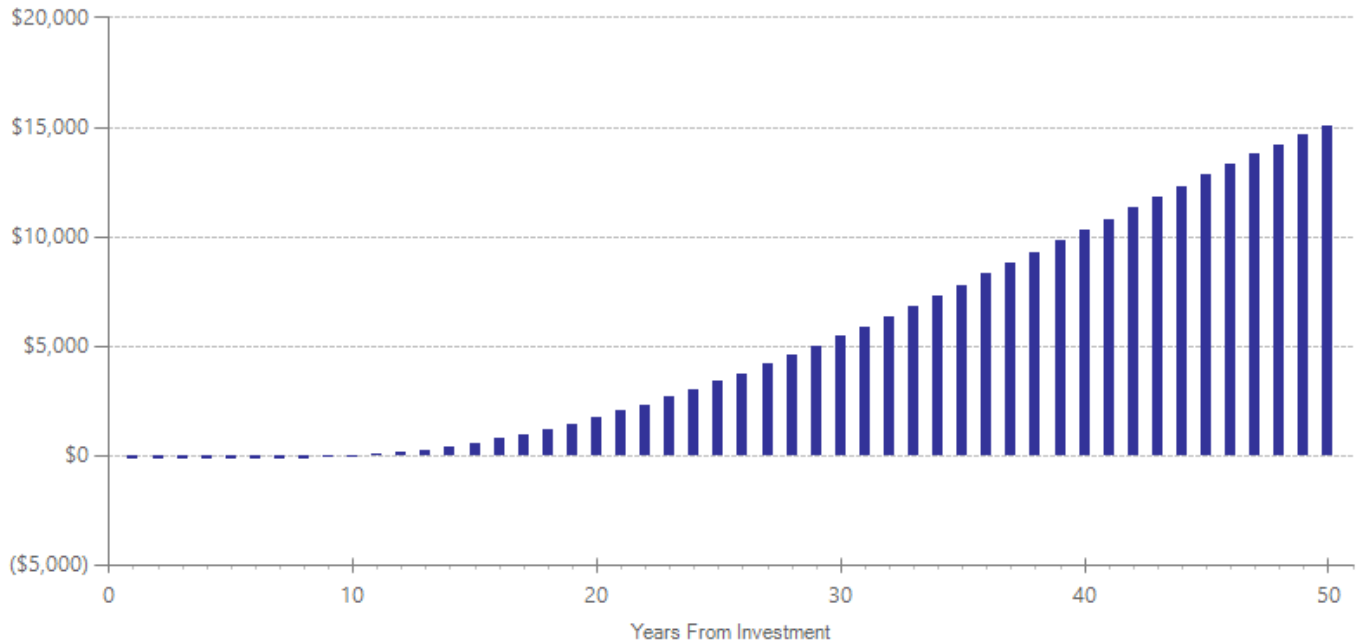
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$106	2013	Present value of net program costs (in 2018 dollars)	(\$79)
Comparison costs	\$29	2009	Cost range (+ or -)	20 %

The cost estimate for the treatment group—receiving more intensive mentoring—is based on Washington State's per-first-year teacher allocation for the Beginning Educator Support Team (BEST) program in FY 2013. The cost estimate for the comparison group is the FY 2009 per-teacher allocation for the Teacher Assistance Program (TAP) in Washington State. Each of these estimates is divided by the number of students per classroom in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	4	1623	0.046	0.082	11	0.033	0.090	17	0.046	0.572

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

- Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M., Johnson, A., Grider, M., . . . Ali, M. (2010). *Impacts of comprehensive teacher induction: Final results from a randomized controlled study*. Washington, DC: National Center for Education Evaluation and Regional Assistance.
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## Out-of-school-time tutoring by adults

### Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: The out-of-school time tutoring programs included in this analysis provide one-on-one or small-group tutoring support to struggling students in English language arts and/or mathematics outside of the regular school day (usually after school). The evaluated tutoring programs provide, on average, about 40 hours of tutoring time to students each year. Tutors are typically specially trained adults (e.g. instructional aides and community volunteers) and receive approximately 10 hours of training.

#### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,582	Benefit to cost ratio	\$6.92
Participants	\$3,716	Benefits minus costs	\$5,791
Others	\$1,960	Chance the program will produce	
Indirect	(\$489)	benefits greater than the costs	93 %
<b>Total benefits</b>	<b>\$6,770</b>		
<b>Net program cost</b>	<b>(\$979)</b>		
<b>Benefits minus cost</b>	<b>\$5,791</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

#### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$3,716	\$1,582	\$1,960	\$0	\$7,259
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$489)	(\$489)
<b>Totals</b>	<b>\$3,716</b>	<b>\$1,582</b>	<b>\$1,960</b>	<b>(\$489)</b>	<b>\$6,770</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

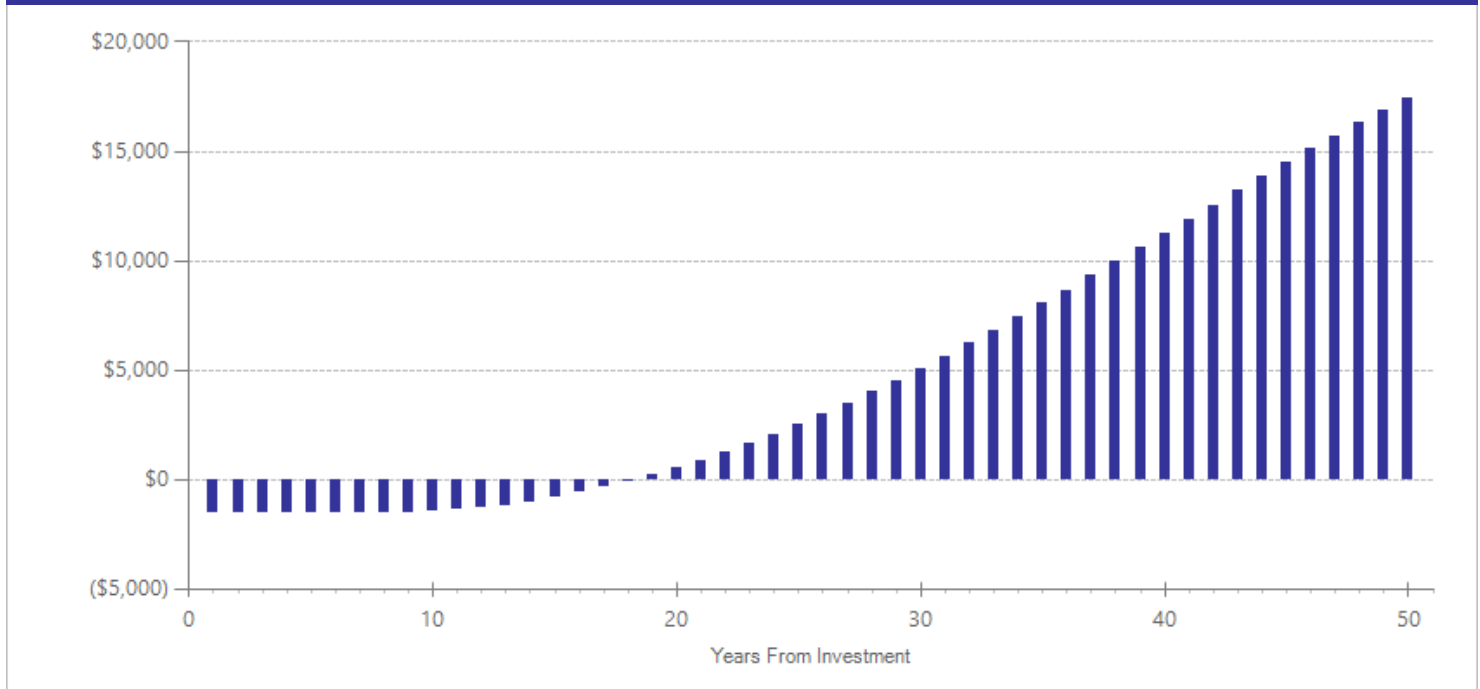
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$917	2013	Present value of net program costs (in 2018 dollars)	(\$979)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, the average after-school tutoring program provides 40 hours of intervention and ten hours of training. The cost estimate assumes that adult instructional aides or community volunteers provide tutoring to groups of two students. To calculate a per-student annual cost, we use average Washington State compensation costs (including benefits) for instructional aides as reported by the Office of the Superintendent of Public Instruction and add per-student materials, supplies, and operating costs to account for overhead (i.e. facility and administrative costs).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	9	6	6082	0.068	0.018	9	0.041	0.020	17	0.259	0.033

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Summer learning programs: Academically focused Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: This analysis includes a variety of summer learning programs for students in grades K–8 in which academic improvement is the main goal, often with a focus on remediation and/or prevention of summer learning loss. The programs encompass a range of models and include both community- and school-provided programs. Some programs offer services beyond academic support, such as enrichment and recreation. Based on the studies in this analysis, a typical program lasts about six weeks. This analysis excludes programs that focus on other goals such as general youth development or job training and programs that combine summer learning programs with additional support during the school year.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,489	Benefit to cost ratio	\$5.16
Participants	\$3,498	Benefits minus costs	\$5,020
Others	\$1,845	Chance the program will produce	
Indirect	(\$604)	benefits greater than the costs	87 %
<u>Total benefits</u>	<u>\$6,228</u>		
<u>Net program cost</u>	<u>(\$1,208)</u>		
Benefits minus cost	\$5,020		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$3,498	\$1,489	\$1,845	\$0	\$6,832
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$604)	(\$604)
Totals	\$3,498	\$1,489	\$1,845	(\$604)	\$6,228

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

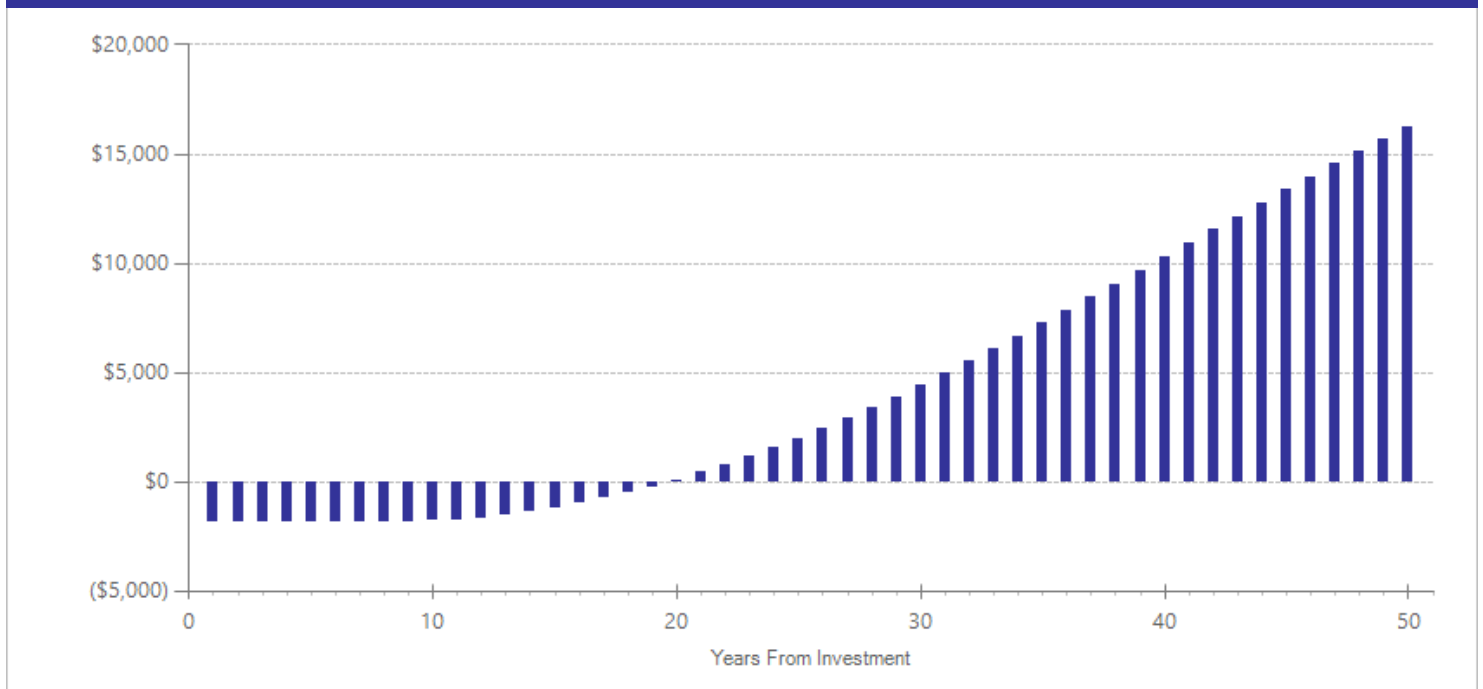
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$1,132	2013	Present value of net program costs (in 2018 dollars)	(\$1,208)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in this meta-analysis, the average summer program included 140 service hours and 40 hours of staff training/planning time. Teachers had, on average, 15 students in each class. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction, divided by the average number of students per class in the evaluated programs. We include per-student annual materials, supplies, and operating costs. The cost estimate provided here does not account for meals or transportation.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	9	13	46259	0.064	0.020	9	0.038	0.022	17	0.064	0.002

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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# Tutoring: Supplemental computer-assisted instruction for struggling readers

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2016.

Program Description: We included computer assisted instruction that was a supplement rather than a replacement for regular instruction. Studies that were focused exclusively on special education populations were excluded. Of the four studies that we included, three were evaluations of Fast ForWord and one was an evaluation of FLASH. On average, the reviewed programs required 4.03 hours of teacher time per student, and effects were reported after one school year.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,083	Benefit to cost ratio	\$8.21
Participants	\$2,545	Benefits minus costs	\$4,115
Others	\$1,343	Chance the program will produce	
Indirect	(\$285)	benefits greater than the costs	60 %
<u>Total benefits</u>	<u>\$4,686</u>		
<u>Net program cost</u>	<u>(\$571)</u>		
Benefits minus cost	\$4,115		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$2,545	\$1,083	\$1,343	\$0	\$4,971
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$285)	(\$285)
<b>Totals</b>	<b>\$2,545</b>	<b>\$1,083</b>	<b>\$1,343</b>	<b>(\$285)</b>	<b>\$4,686</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

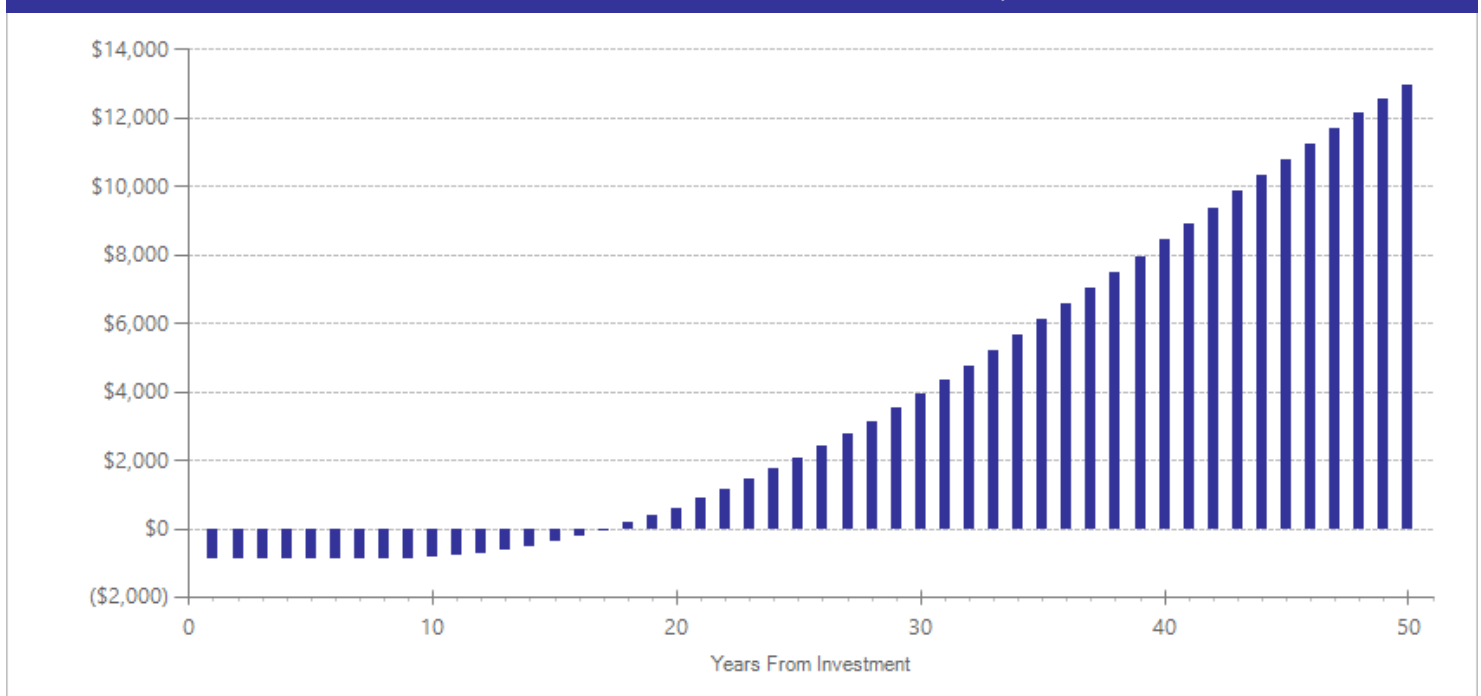
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$535	2013	Present value of net program costs (in 2018 dollars)	(\$571)
Comparison costs	\$0	2013	Cost range (+ or -)	50 %

In this review, studies reported the effect of one year of the program. The cost of the supplemental computer assisted instruction can vary widely based on the number of students in each school using the program and the number of students using the program at one time. The interventions included in this review required an average of 4.03 hours of teacher time per student. The per student staff costs were calculated by multiplying the staff hours/student by the hour rate of a K-8 teacher in 2013 (<https://www.k12.wa.us/safs/PUB/PER/1314/tbl34.pdf>). We estimated that the per student licensing cost was \$210 per student for a program like Fast ForWord in 2016 based on a school license of \$21,000 assuming that 100 students in each school use the program (personal communication with Gayle Davies, Scientific Learning, March 30, 2016).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	9	4	326	0.047	0.089	9	0.028	0.098	17	0.136	0.317

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Parents as tutors with teacher oversight

### Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: In "parents as tutors" programs, teachers meet with parents in person and maintain contact over the phone to train and encourage parents to engage in planned, structured academic activities with their children at home, usually in the form of one-on-one reading tutoring. This review does not include the impact on children's academic achievement from parent involvement in general; only school-based programs are included.

#### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,132	Benefit to cost ratio	\$5.63
Participants	\$2,659	Benefits minus costs	\$3,922
Others	\$1,402	Chance the program will produce	
Indirect	(\$424)	benefits greater than the costs	55 %
<b>Total benefits</b>	<b>\$4,769</b>		
<b>Net program cost</b>	<b>(\$847)</b>		
<b>Benefits minus cost</b>	<b>\$3,922</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

#### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$2,659	\$1,132	\$1,402	\$0	\$5,193
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$424)	(\$424)
<b>Totals</b>	<b>\$2,659</b>	<b>\$1,132</b>	<b>\$1,402</b>	<b>(\$424)</b>	<b>\$4,769</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

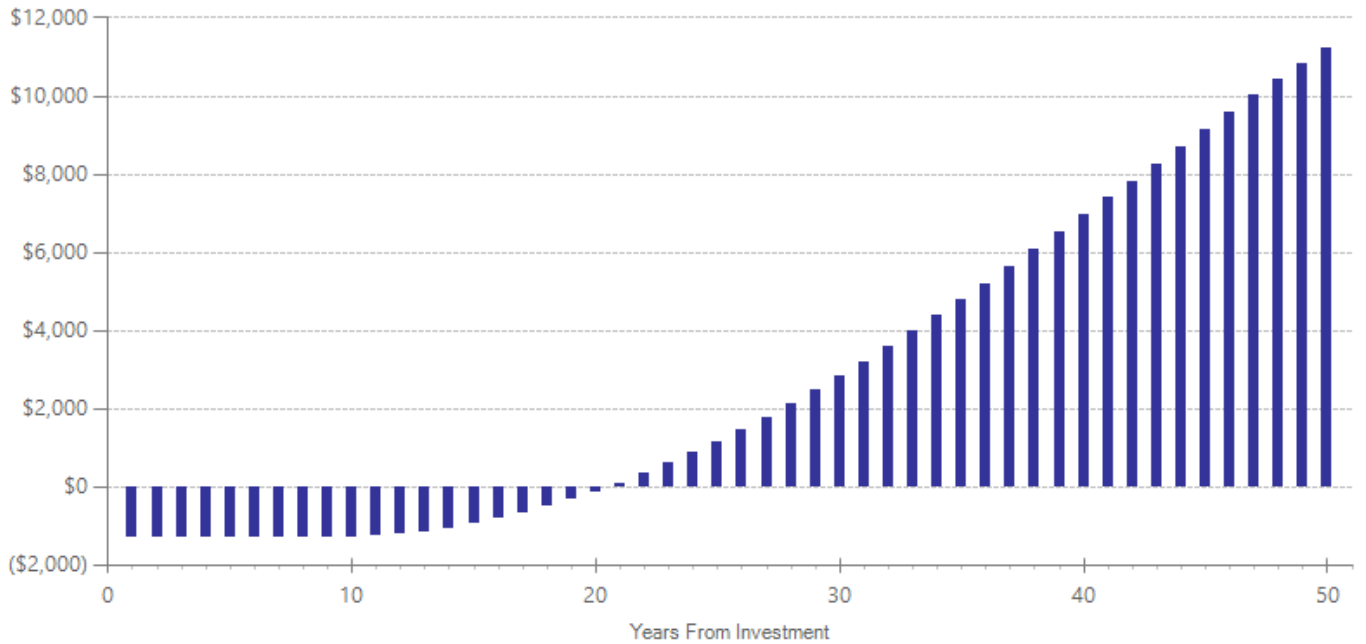
#### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$794	2013	Present value of net program costs (in 2018 dollars)	(\$847)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

To estimate costs, we assume that teachers spend an average of one-quarter hour per week to maintain contact with parents during the school year, based on the evaluations included in our analysis. We calculated the value of teacher time using average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
Test scores	8	9	149	0.050	0.115	9	0.030	0.127	17	0.167	0.149

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis



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# Growth mindset interventions

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated February 2018.

Program Description: This analysis evaluates psychological interventions that encourage students to believe that intelligence is malleable and can be changed with experience and learning. Growth mindset interventions teach students scientific facts about the brain's plasticity and the physiological nature of learning. The interventions aim to enhance students' persistence and prevent students from attributing setbacks to innate ability. Most students in this analysis were in grades four through nine. Students receive between two to eight lessons, each lasting about one hour. Lessons can be delivered by teachers, mentors, or through the use of internet software. Lessons occur during regular class periods.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$830	Benefit to cost ratio	\$93.23
Participants	\$1,950	Benefits minus costs	\$3,748
Others	\$1,029	Chance the program will produce	
Indirect	(\$20)	benefits greater than the costs	58 %
<b>Total benefits</b>	<b>\$3,789</b>		
<b>Net program cost</b>	<b>(\$41)</b>		
<b>Benefits minus cost</b>	<b>\$3,748</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$1,950	\$830	\$1,029	\$0	\$3,809
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$20)	(\$20)
<b>Totals</b>	<b>\$1,950</b>	<b>\$830</b>	<b>\$1,029</b>	<b>(\$20)</b>	<b>\$3,789</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

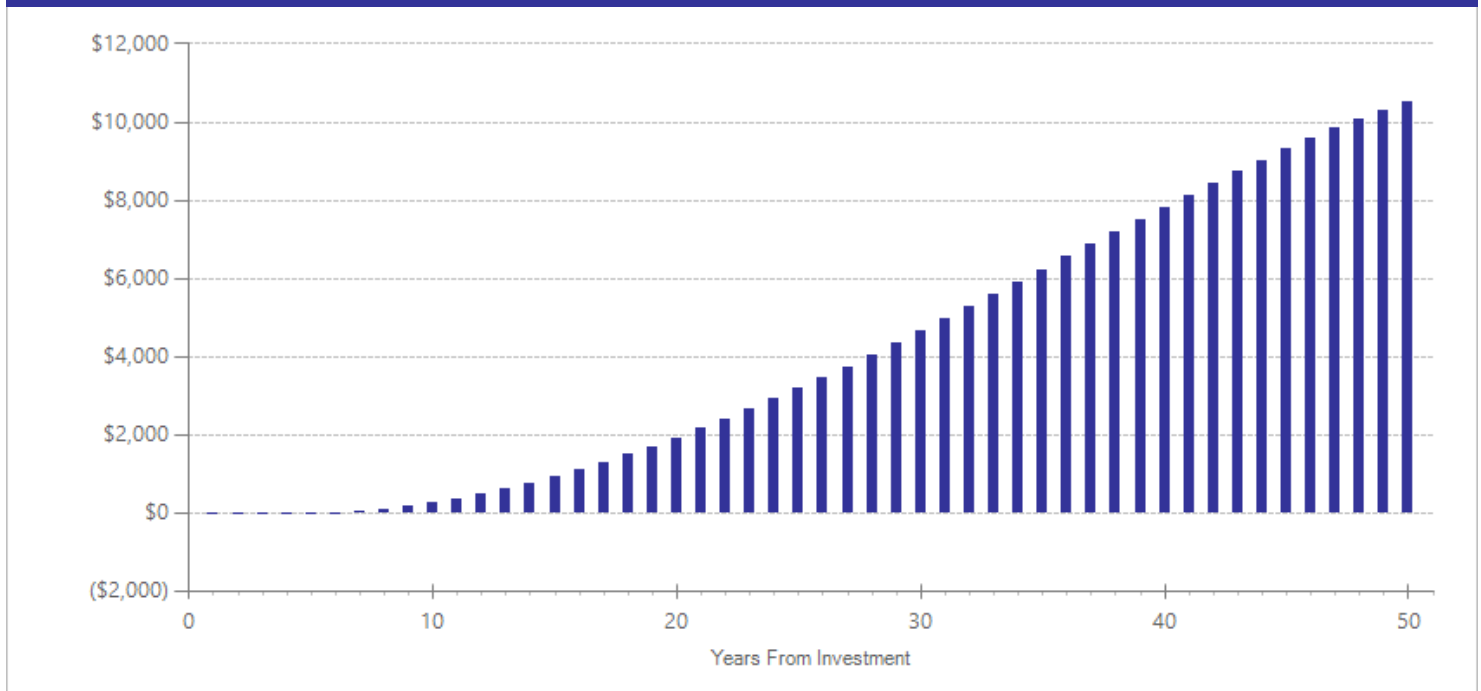
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$39	2016	Present value of net program costs (in 2018 dollars)	(\$41)
Comparison costs	\$0	2016	Cost range (+ or -)	60 %

To estimate the annual per-participant program cost, we used the average Washington State compensation costs (including benefits) for certificated teachers. We retrieved teacher salary and benefits figures from the Office of Superintendent of Public Instruction (OSPI). We assume students receive five hourly lessons.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Grade point average <sup>^</sup>	14	4	2165	0.062	0.085	14	n/a	n/a	n/a	0.145	0.096
Test scores	14	3	266	0.032	0.098	14	0.019	0.108	17	0.057	0.679

<sup>^</sup>WSIPP’s benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Tutoring: By adults, one-on-one, non-structured

### Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: The tutoring programs included in this analysis provide one-on-one assistance to struggling students in English language arts and/or mathematics. The evaluated programs typically allow tutors to exercise their own discretion when selecting and implementing tutoring strategies. The programs typically serve early elementary school students and provide, on average, about 30 hours of tutoring time to an individual student each year. The tutors are non-certificated adults (e.g. instructional aides and community volunteers) who receive approximately two hours of training per year.

#### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,076	Benefit to cost ratio	\$2.75
Participants	\$2,527	Benefits minus costs	\$2,655
Others	\$1,333	Chance the program will produce	
Indirect	(\$760)	benefits greater than the costs	73 %
<u>Total benefits</u>	<u>\$4,175</u>		
<u>Net program cost</u>	<u>(\$1,521)</u>		
Benefits minus cost	\$2,655		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

#### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$2,527	\$1,076	\$1,333	\$0	\$4,935
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$760)	(\$760)
<b>Totals</b>	<b>\$2,527</b>	<b>\$1,076</b>	<b>\$1,333</b>	<b>(\$760)</b>	<b>\$4,175</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

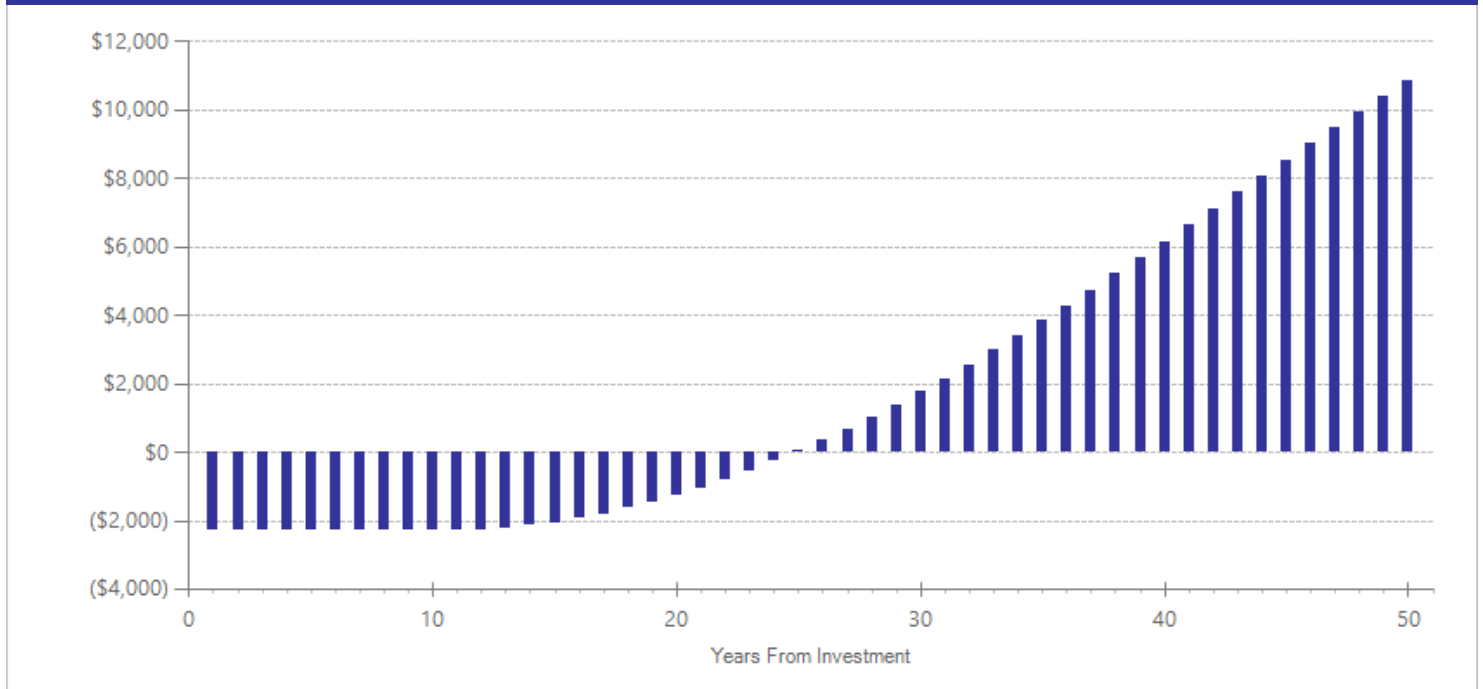
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$1,425	2013	Present value of net program costs (in 2018 dollars)	(\$1,521)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, the average non-structured one-on-one tutoring program provides 30 hours of intervention per student and two hours of training time per tutor. The estimate assumed that certificated teachers provide approximately four hours of planning support and oversight. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K-8 teacher and instructional aides as reported by the Office of the Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	7	12	6253	0.061	0.018	7	0.029	0.020	17	0.062	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Teacher performance pay programs

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated October 2015.

Program Description: Teacher performance pay programs distribute bonuses to individual teachers and sometimes to school wide staff. Performance is usually measured as value-added student test scores alone or in combination with some other assessment (such as principal evaluations). These evaluations examine the impact on student test scores from short-term, pilot performance pay programs.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$576	Benefit to cost ratio	\$69.67
Participants	\$1,353	Benefits minus costs	\$2,586
Others	\$714	Chance the program will produce	
Indirect	(\$19)	benefits greater than the costs	87 %
<b>Total benefits</b>	<b>\$2,624</b>		
<b>Net program cost</b>	<b>(\$38)</b>		
<b>Benefits minus cost</b>	<b>\$2,586</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$1,353	\$576	\$714	\$0	\$2,643
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$19)	(\$19)
<b>Totals</b>	<b>\$1,353</b>	<b>\$576</b>	<b>\$714</b>	<b>(\$19)</b>	<b>\$2,624</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

### Detailed Annual Cost Estimates Per Participant

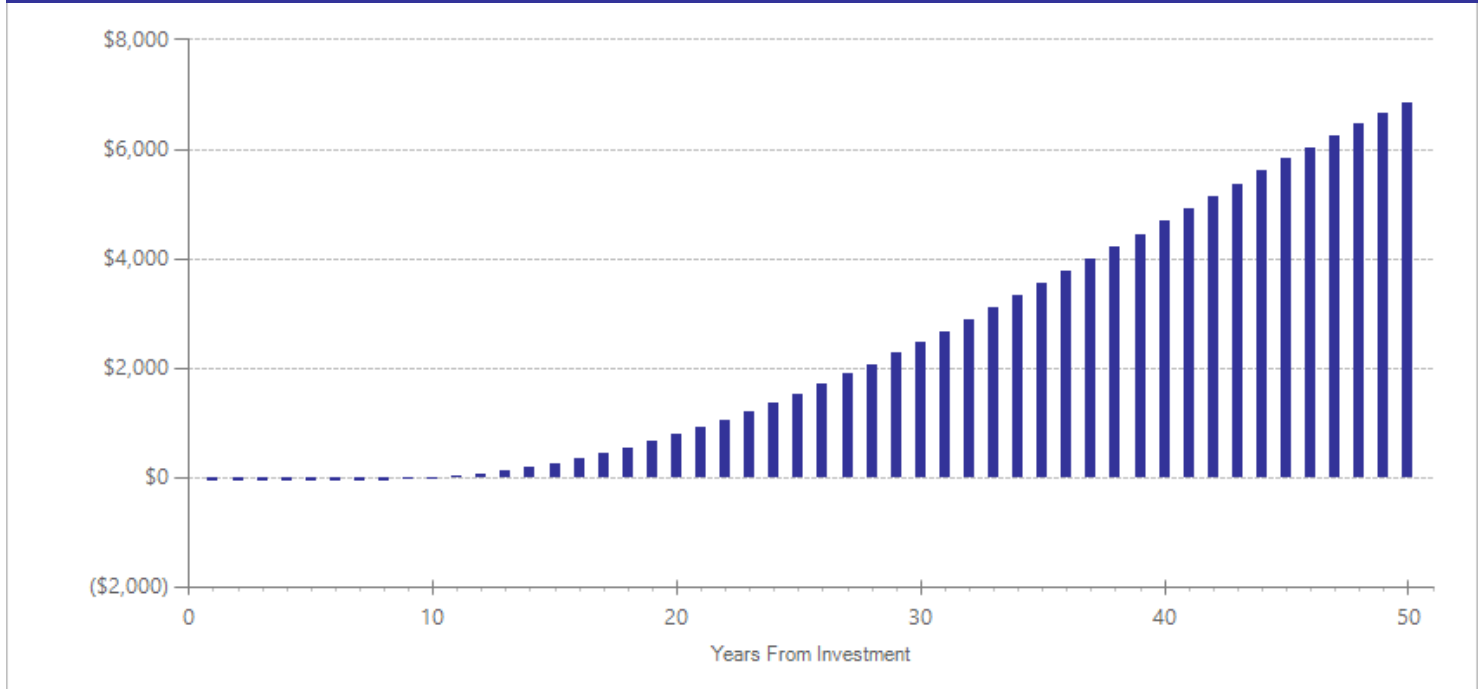
	Annual cost	Year dollars	Summary	
Program costs	\$33	2010	Present value of net program costs (in 2018 dollars)	(\$38)
Comparison costs	\$0	2010	Cost range (+ or -)	20 %

The performance bonuses in the evaluated programs ranged from a minimum of \$1,500 to a maximum of \$15,000; in over half of the programs, the maximum award was \$3,000. For this estimate, we use the median bonus of approximately \$2,500 per teacher (including administrative costs), spread across 25 students.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).



## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
Test scores	10	28	652322	0.019	0.011	12	0.015	0.013	17	0.019	0.095

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Becoming a Man (BAM) Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated April 2018.

Program Description: Becoming a Man (BAM) is a high school behavioral program that provides a non-academic intervention to disadvantaged and at-risk males through exposure to prosocial adults and skills training based on cognitive behavioral therapy. The program focuses on teaching character and social-emotional skills including considering another person's perspective, evaluating consequences ahead of time, and reducing automatic decision-making. Participants in this analysis attended weekly one-hour group sessions during the school day over the course of one academic school year.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$1,213	Benefit to cost ratio	\$2.13
Participants	\$1,147	Benefits minus costs	\$2,370
Others	\$2,819	Chance the program will produce	
Indirect	(\$709)	benefits greater than the costs	74 %
<u>Total benefits</u>	<u>\$4,469</u>		
<u>Net program cost</u>	<u>(\$2,099)</u>		
Benefits minus cost	\$2,370		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$802	\$2,169	\$401	\$3,372
Labor market earnings associated with high school graduation	\$1,250	\$532	\$684	\$0	\$2,466
Costs of higher education	(\$103)	(\$122)	(\$34)	(\$61)	(\$320)
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$1,049)	(\$1,049)
<u>Totals</u>	<u>\$1,147</u>	<u>\$1,213</u>	<u>\$2,819</u>	<u>(\$709)</u>	<u>\$4,469</u>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

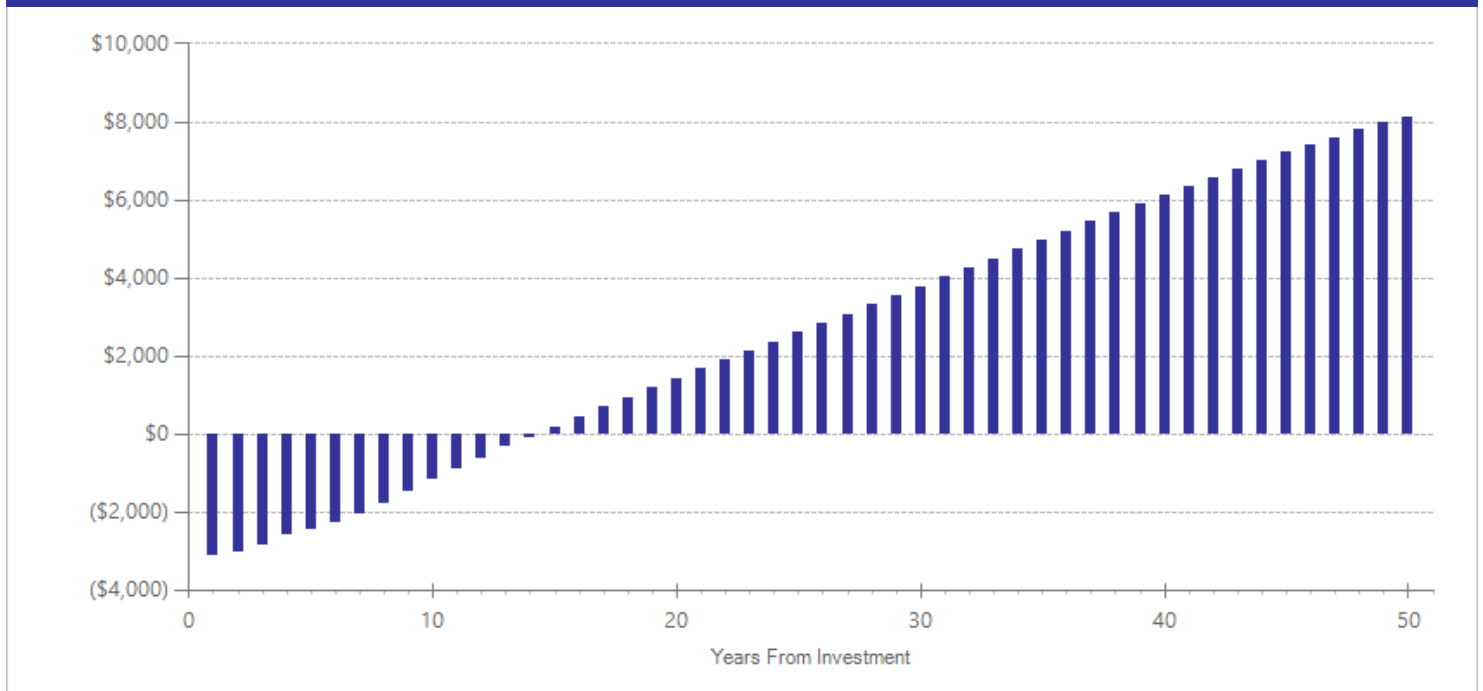
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$2,000	2015	Present value of net program costs (in 2018 dollars)	(\$2,099)
Comparison costs	\$0	2015	Cost range (+ or -)	10 %

We used a per-participant program cost reported in Heller et al. (2015). Thinking, fast and slow: Some field experiments to reduce crime and dropout in Chicago (NBER Working Paper 21178). Cambridge, MA: National Bureau of Economic Research.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Crime	14	1	1016	-0.072	0.044	14	-0.072	0.044	24	-0.072	0.100
Grade point average <sup>^</sup>	14	1	1016	-0.005	0.044	14	n/a	n/a	n/a	-0.005	0.913
School attendance <sup>^</sup>	14	1	1016	0.010	0.044	14	n/a	n/a	n/a	0.010	0.815

<sup>^</sup>WSIPP’s benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

Heller, S.B., Shah, A.K., Guryan, J., Ludwig, J., Mullainathan, S., & Pollack, H.A. (2015). *Thinking, fast and slow?: Some field experiments to reduce crime and dropout in Chicago* (NBER Working Paper 21178). Cambridge, MA: National Bureau of Economic Research.

## Summer book programs: One-year intervention Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: The summer book programs included in this analysis provide free books to elementary school students. Generally, the goal of summer book programs is to increase print exposure, the number of books at home, and voluntary reading time. Books are matched to each student's reading level and area of interest and are mailed to students weekly over the summer break. The mailing includes a form for the student to complete after finishing the book. This analysis includes school-based programs only and does not include bookmobiles or public library programs. The studies included in this analysis measure the program's impact after one summer.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$486	Benefit to cost ratio	\$26.65
Participants	\$1,142	Benefits minus costs	\$2,108
Others	\$603	Chance the program will produce	
Indirect	(\$41)	benefits greater than the costs	58 %
<u>Total benefits</u>	<u>\$2,190</u>		
<u>Net program cost</u>	<u>(\$82)</u>		
Benefits minus cost	\$2,108		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$1,142	\$486	\$603	\$0	\$2,231
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$41)	(\$41)
<b>Totals</b>	<b>\$1,142</b>	<b>\$486</b>	<b>\$603</b>	<b>(\$41)</b>	<b>\$2,190</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

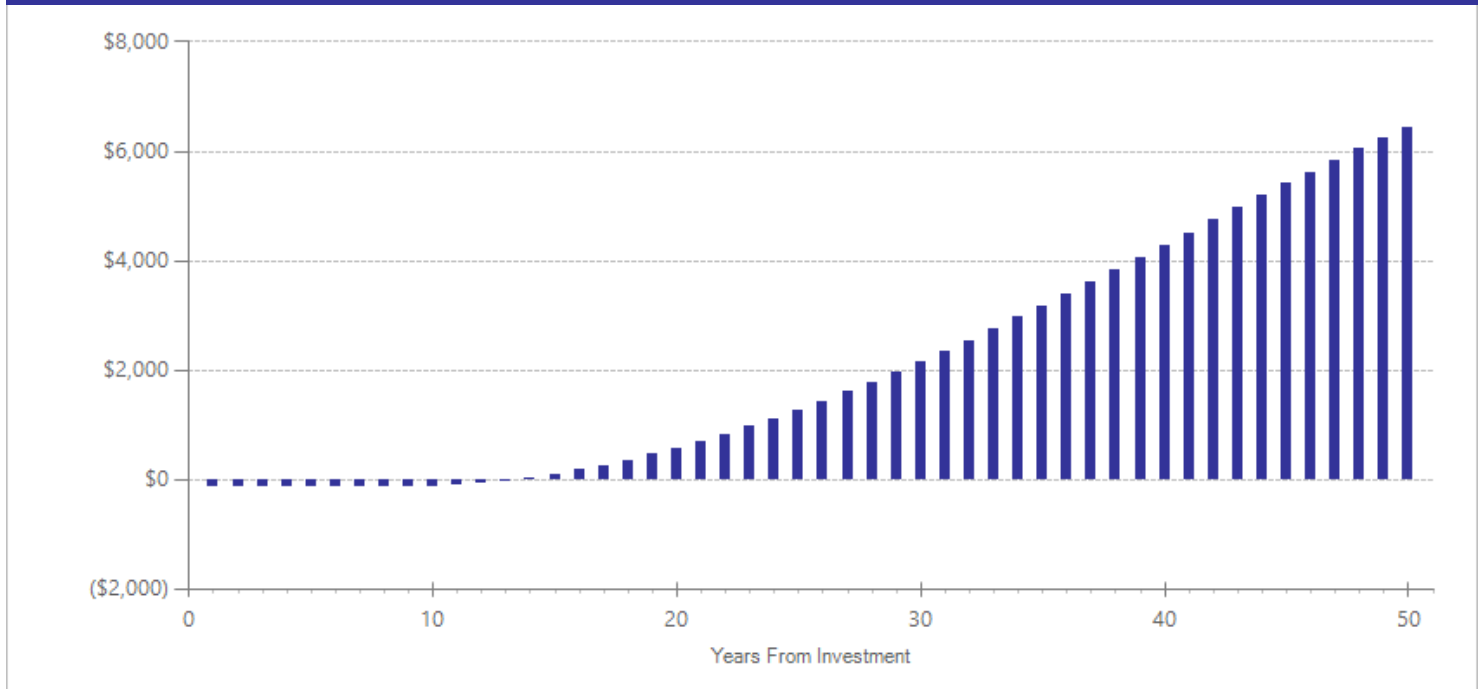
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$77	2013	Present value of net program costs (in 2018 dollars)	(\$82)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K–8 teacher as reported by the Office of the Superintendent of Public Instruction to account for the time it takes teachers to administer the program divided by the average number of students per classroom in Washington's prototypical schools formula. In addition to compensation, the estimate accounts for the cost of purchasing and shipping ten books to each student's home.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	9	3	1018	0.019	0.061	10	0.013	0.067	17	0.019	0.752

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

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WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

- Kim, J.S. (2007). The effects of a voluntary summer reading intervention on reading activities and reading achievement. *Journal of Educational Psychology, 99*(3), 505-515.
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## Teacher professional development: Online, targeted Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: Generally, professional development (PD) for K–12 teachers includes activities such as workshops, conferences, summer institutes, and time set aside during the school year for staff development. Online, targeted PD provides online training and collaboration with a focus on improving teaching in a particular content area (such as reading, math, or science) and/or a particular grade level.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$554	Benefit to cost ratio	\$7.69
Participants	\$1,302	Benefits minus costs	\$2,077
Others	\$687	Chance the program will produce	
Indirect	(\$155)	benefits greater than the costs	61 %
<u>Total benefits</u>	<u>\$2,387</u>		
<u>Net program cost</u>	<u>(\$310)</u>		
Benefits minus cost	\$2,077		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$1,302	\$554	\$687	\$0	\$2,542
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$155)	(\$155)
<b>Totals</b>	<b>\$1,302</b>	<b>\$554</b>	<b>\$687</b>	<b>(\$155)</b>	<b>\$2,387</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

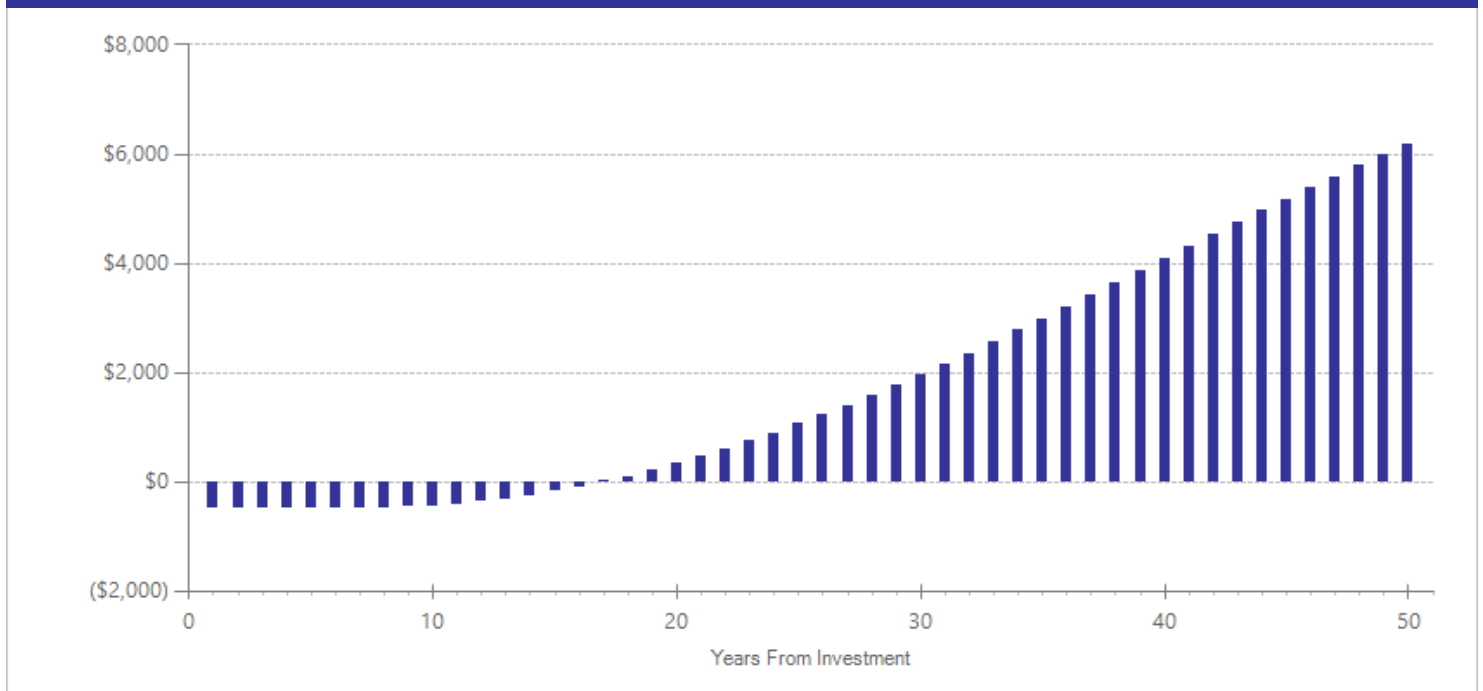
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$291	2013	Present value of net program costs (in 2018 dollars)	(\$310)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, teachers received an average of 70 additional hours of targeted online professional development (PD) in comparison with the usual amount of PD time. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and added per-student materials, supplies, and operating costs to account for the overhead (i.e. computer and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	3	2245	0.020	0.037	11	0.014	0.041	17	0.143	0.002

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## First Step to Success Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated May 2015.

Program Description: First Step to Success is an early intervention program for students at risk for behavior problems. The program has three components: universal screening, classroom intervention, and home-based intervention. In the classroom intervention, behavior coaches and teachers provide visual cues to identified students to indicate when the student is on-task and exhibiting appropriate behaviors. Students earn points and may receive rewards if they meet their daily goal. In the home-based component, the behavior coach conducts six weekly home-visits and works with families to teach parenting skills and encourage collaboration between the home and the school. The intervention typically runs for three months.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$635	Benefit to cost ratio	\$4.18
Participants	\$1,492	Benefits minus costs	\$1,980
Others	\$787	Chance the program will produce	
Indirect	(\$311)	benefits greater than the costs	53 %
<u>Total benefits</u>	<u>\$2,603</u>		
<u>Net program cost</u>	<u>(\$623)</u>		
Benefits minus cost	\$1,980		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$1,492	\$635	\$787	\$0	\$2,914
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$311)	(\$311)
Totals	\$1,492	\$635	\$787	(\$311)	\$2,603

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

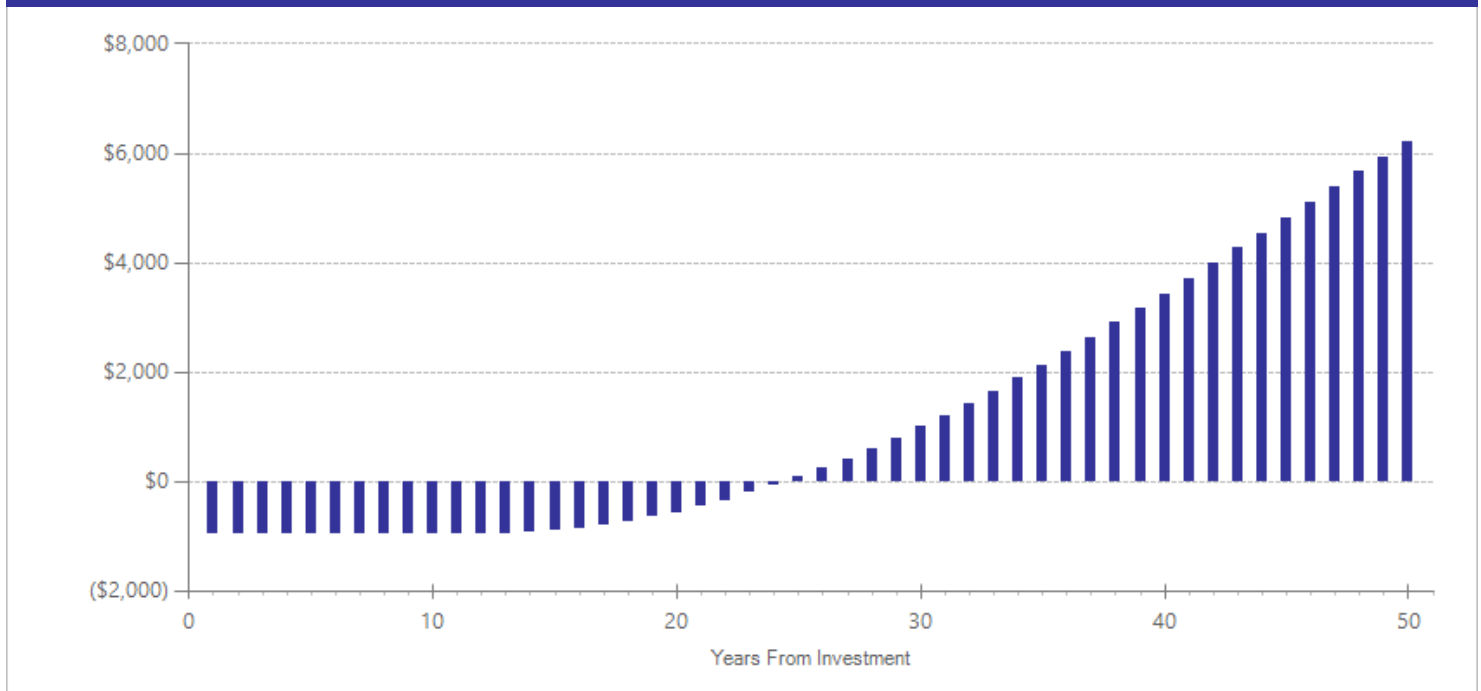
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$500	2005	Present value of net program costs (in 2018 dollars)	(\$623)
Comparison costs	\$0	2005	Cost range (+ or -)	10 %

This program is typically implemented over a three-month period. Per-student cost information is based on program materials and behavior coach time, as documented in Walker, H.M., Golly, A., McLane, J.Z., & Kimmich, M. (2005). The Oregon First Step to Success replication initiative: Statewide results of an evaluation of program's impact. *Journal of Emotional and Behavioral Disorders, 13*(3), 163–172.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Disruptive behavior disorder symptoms	5	1	23	-0.105	0.298	5	n/a	n/a	n/a	-1.066	0.001
Test scores	5	2	243	0.033	0.114	8	0.018	0.125	17	0.022	0.847

^^WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Class size: reducing average class size by one student in kindergarten Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing kindergarten average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$400	Benefit to cost ratio	\$7.91
Participants	\$932	Benefits minus costs	\$1,506
Others	\$499	Chance the program will produce	
Indirect	(\$107)	benefits greater than the costs	94 %
<b>Total benefits</b>	<b>\$1,724</b>		
<b>Net program cost</b>	<b>(\$218)</b>		
<b>Benefits minus cost</b>	<b>\$1,506</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$4	\$8	\$2	\$13
Labor market earnings associated with test scores	\$932	\$397	\$491	\$0	\$1,820
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$109)	(\$109)
<b>Totals</b>	<b>\$932</b>	<b>\$400</b>	<b>\$499</b>	<b>(\$107)</b>	<b>\$1,724</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

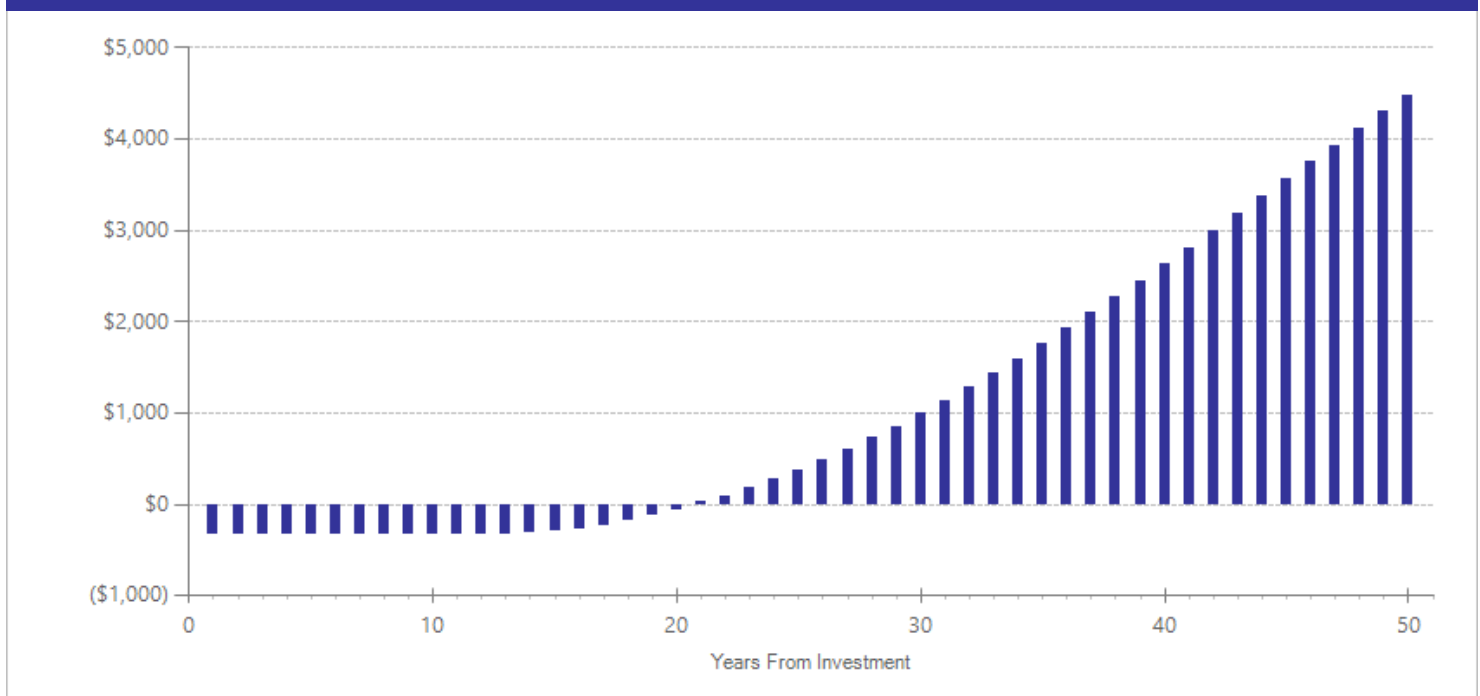
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$198	2011	Present value of net program costs (in 2018 dollars)	(\$218)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs were calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation included salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	5	77	1000	0.015	0.005	5	0.015	0.005	18	0.015	0.005
Test scores	5	77	1000	0.036	0.013	5	0.011	0.005	17	0.036	0.005



Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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## Tutoring: Supplemental Educational Services (under Title I) Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated May 2015.

Program Description: Current federal education law directs school districts who do not make "Adequate Yearly Progress" toward student proficiency standards to provide "Supplemental Educational Services"—primarily out-of-school-time tutoring—to eligible students at no charge to students and their families. Providers of SES include local and national for-profit and non-profit organizations as well as school districts themselves (unless they are identified as "in need of improvement" under AYP or have a waiver). Delivery methods (e.g., one-on-one, group, or online) vary; the amount of tutoring ranges from approximately 20 to 40 hours. This analysis estimates the impact of offering SES in school districts throughout the United States on reading and math test scores.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$815	Benefit to cost ratio	\$1.63
Participants	\$1,914	Benefits minus costs	\$1,112
Others	\$1,010	Chance the program will produce	
Indirect	(\$876)	benefits greater than the costs	61 %
<b>Total benefits</b>	<b>\$2,864</b>		
<b>Net program cost</b>	<b>(\$1,751)</b>		
<b>Benefits minus cost</b>	<b>\$1,112</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$1,914	\$815	\$1,010	\$0	\$3,739
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$876)	(\$876)
<b>Totals</b>	<b>\$1,914</b>	<b>\$815</b>	<b>\$1,010</b>	<b>(\$876)</b>	<b>\$2,864</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

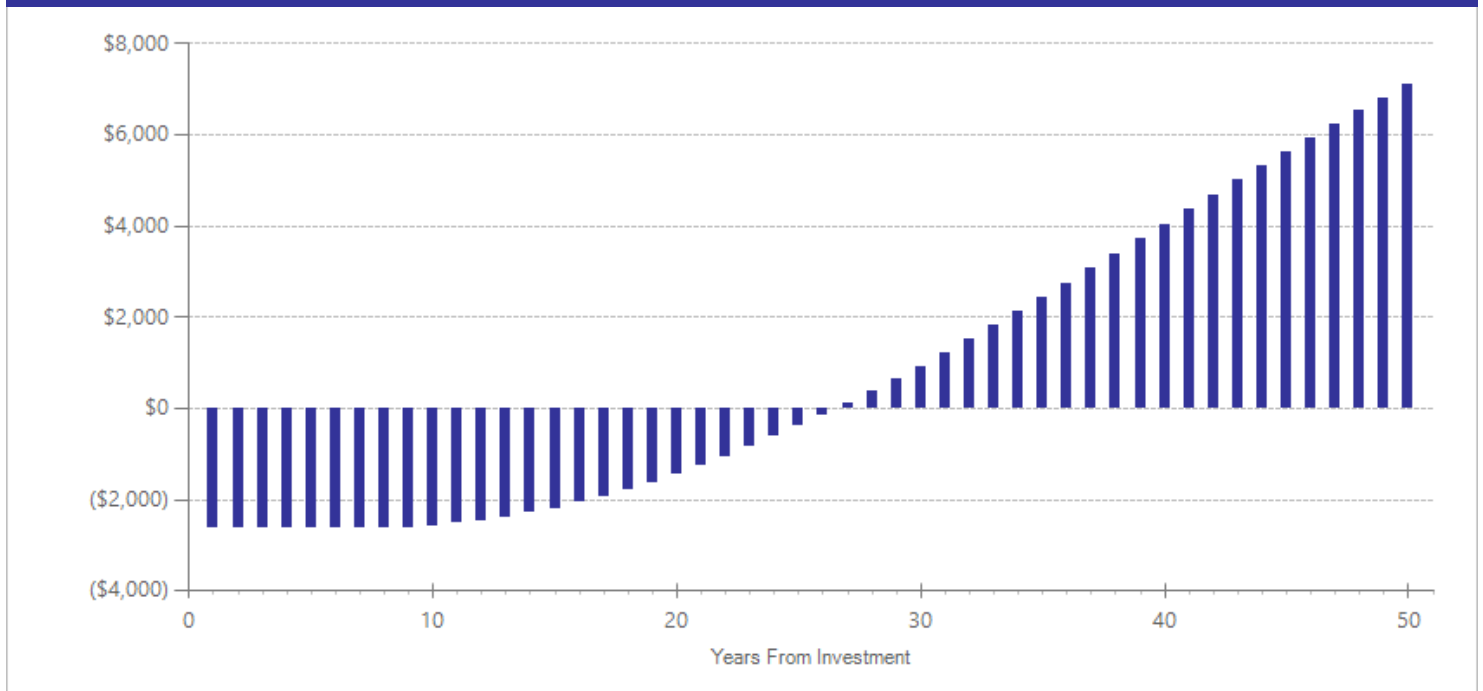
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$1,550	2010	Present value of net program costs (in 2018 dollars)	(\$1,751)
Comparison costs	\$0	2010	Cost range (+ or -)	30 %

Average costs are estimated in the range (\$1,100 to \$2,000) reported in Heinrich, C.J., Burch, P., Good, A., Acosta, R., Cheng, H., Dillender, M., Kirshbaum, C., . . . Stewart, M. (2014). Improving the implementation and effectiveness of out-of-school time tutoring. *Journal of Policy Analysis and Management*, 1-34.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
Test scores	10	22	293256	0.029	0.010	11	0.021	0.011	17	0.029	0.006

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Summer book programs: One-year intervention, with additional support Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

**Program Description:** The summer book programs included in this analysis provide free books to elementary school students paired with additional reading support (e.g., lessons from certified teachers). Generally, the goal of summer book programs is to increase print exposure, the number of books at home, and voluntary reading time. Books are matched to each student's reading level and area of interest and are mailed to students weekly over the summer break. The mailing includes a form for the student to complete after finishing the book. This analysis includes school-based programs only and does not include bookmobiles or public library programs. The studies included in this analysis measure the program's impact after one summer.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$261	Benefit to cost ratio	\$9.35
Participants	\$614	Benefits minus costs	\$1,016
Others	\$324	Chance the program will produce	
Indirect	(\$61)	benefits greater than the costs	57 %
<b>Total benefits</b>	<b>\$1,138</b>		
<b>Net program cost</b>	<b>(\$122)</b>		
<b>Benefits minus cost</b>	<b>\$1,016</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

#### Benefits from changes to:<sup>1</sup>

#### Benefits to:

	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$614	\$261	\$324	\$0	\$1,198
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$61)	(\$61)
<b>Totals</b>	<b>\$614</b>	<b>\$261</b>	<b>\$324</b>	<b>(\$61)</b>	<b>\$1,138</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

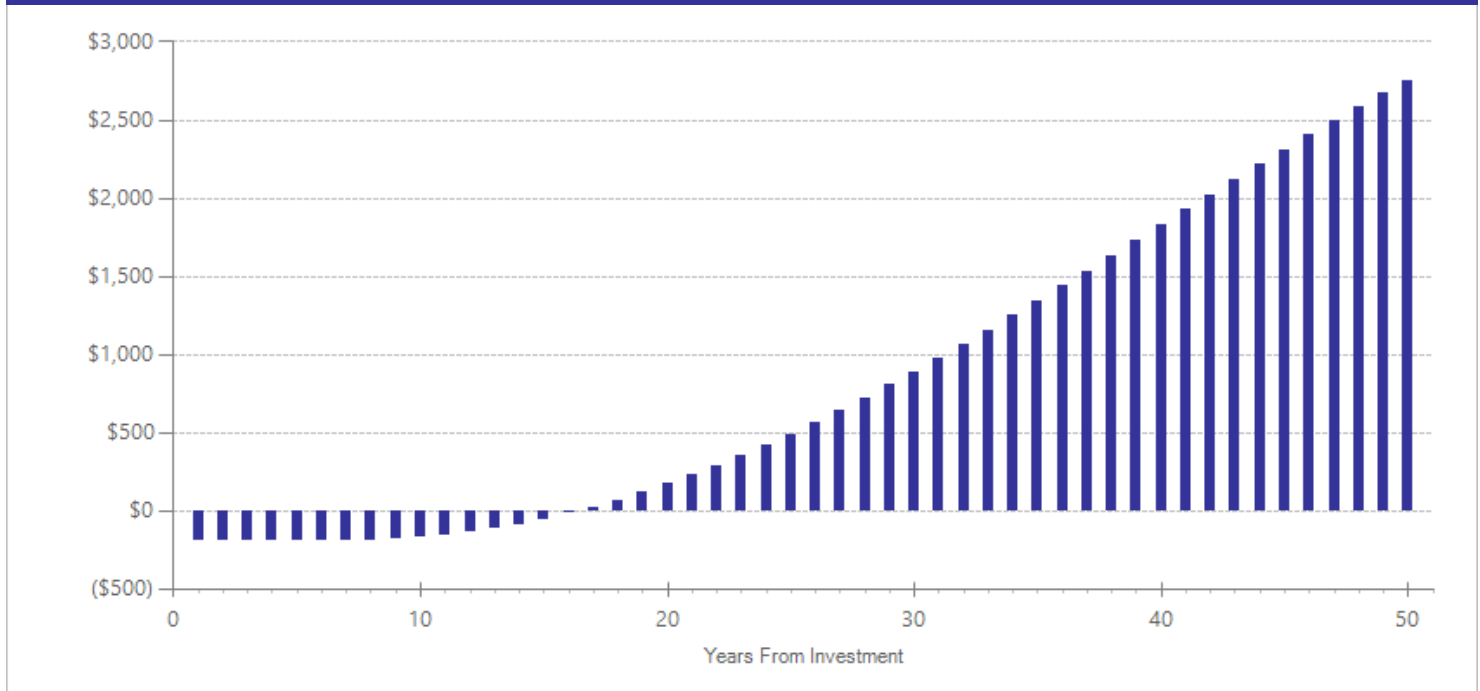
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$114	2013	Present value of net program costs (in 2018 dollars)	(\$122)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K–8 teacher as reported by the Office of the Superintendent of Public Instruction to account for class time and time to administer the program divided by the average number of students per classroom in Washington’s prototypical schools formula. In addition to compensation, the estimate accounts for the cost of purchasing and shipping ten books to each student’s home. The costs do not include parent time for involvement in reading instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	5	3340	0.010	0.026	10	0.007	0.029	17	0.021	0.419

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Class size: reducing average class size by one student in grade 1 Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing 1st grade average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$268	Benefit to cost ratio	\$5.14
Participants	\$625	Benefits minus costs	\$902
Others	\$334	Chance the program will produce	
Indirect	(\$108)	benefits greater than the costs	84 %
<u>Total benefits</u>	<u>\$1,120</u>		
<u>Net program cost</u>	<u>(\$218)</u>		
Benefits minus cost	\$902		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$2	\$4	\$1	\$7
Labor market earnings associated with test scores	\$625	\$266	\$330	\$0	\$1,221
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$109)	(\$109)
<b>Totals</b>	<b>\$625</b>	<b>\$268</b>	<b>\$334</b>	<b>(\$108)</b>	<b>\$1,120</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

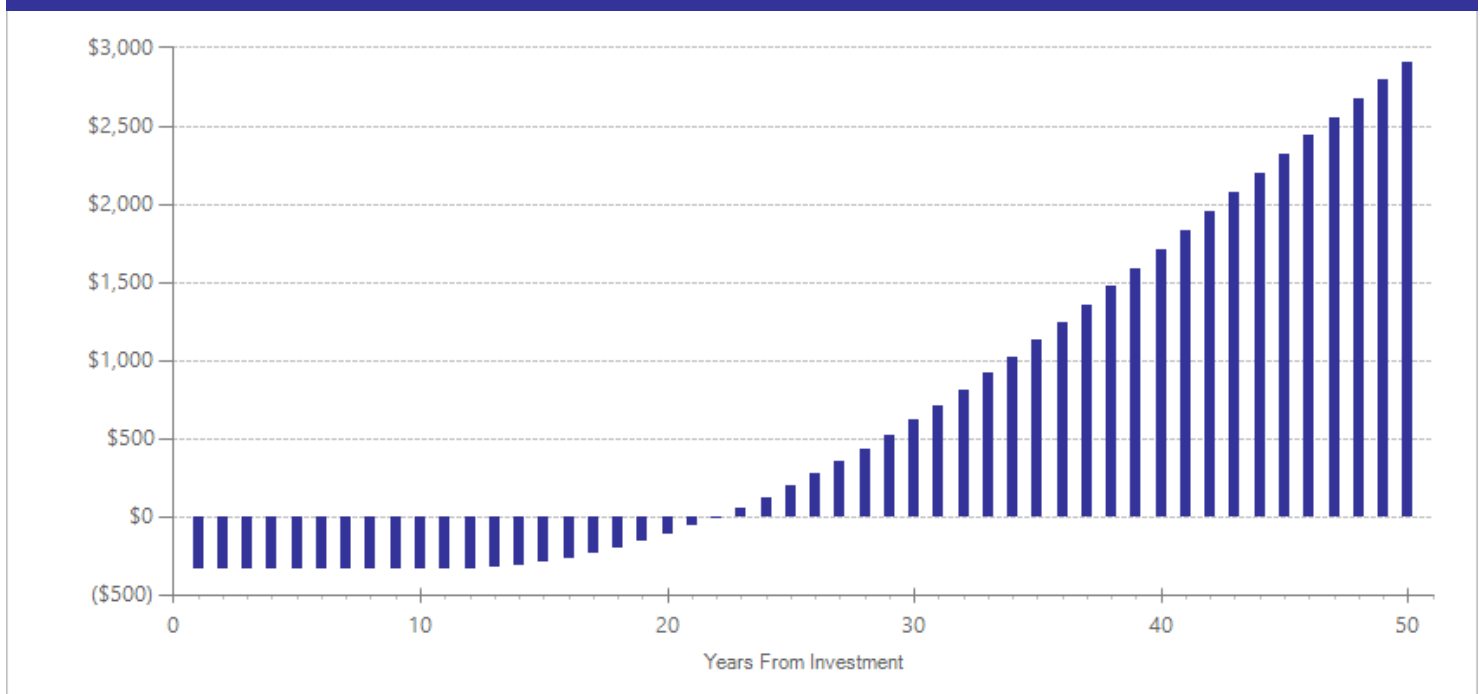
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$198	2011	Present value of net program costs (in 2018 dollars)	(\$218)
Comparison costs	\$0	2011	Cost range (+ or -)	10 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs were calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
High school graduation	6	77	1000	0.008	0.004	6	0.008	0.004	18	0.008	0.163
Test scores	6	77	1000	0.018	0.010	6	0.007	0.005	17	0.018	0.059

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

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# Per-pupil expenditures: 10% increase for one student cohort from kindergarten through grade 12

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated April 2012.

Program Description: In the 2011-12 school year, Washington State school districts spent an average of \$9,739 per public school student (including state, federal, local, and other sources). This analysis estimates the benefits and costs for increasing per-pupil expenditures by 10% for one cohort of students starting in kindergarten and continuing those increased expenditures for 13 years (grades K through 12).

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,919	Benefit to cost ratio	\$1.07
Participants	\$9,148	Benefits minus costs	\$786
Others	\$4,874	Chance the program will produce	
Indirect	(\$5,710)	benefits greater than the costs	45 %
<b>Total benefits</b>	<b>\$12,230</b>		
<b>Net program cost</b>	<b>(\$11,445)</b>		
<b>Benefits minus cost</b>	<b>\$786</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$24	\$49	\$12	\$85
Labor market earnings associated with test scores	\$9,148	\$3,894	\$4,825	\$0	\$17,867
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$5,722)	(\$5,722)
<b>Totals</b>	<b>\$9,148</b>	<b>\$3,919</b>	<b>\$4,874</b>	<b>(\$5,710)</b>	<b>\$12,230</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

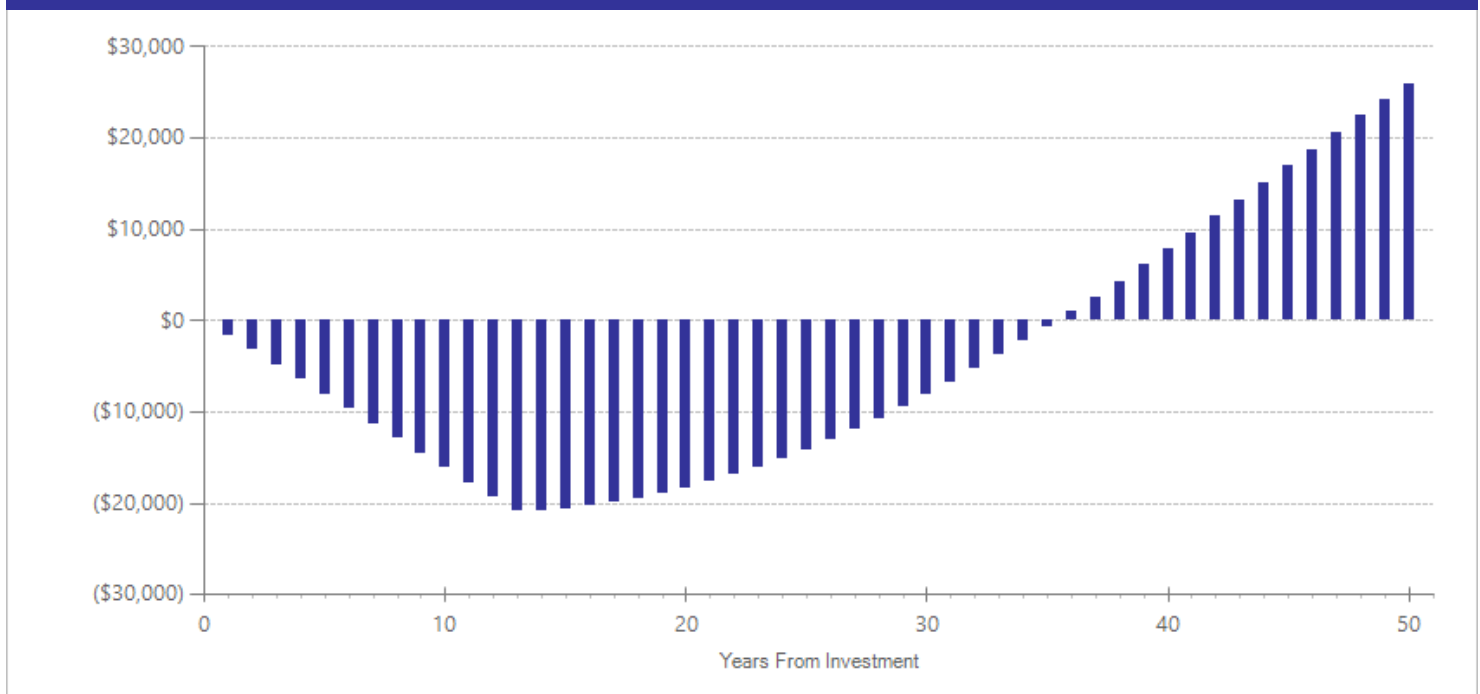
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$974	2011	Present value of net program costs (in 2018 dollars)	(\$11,445)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

Office of Superintendent of Public Instruction (2013). Financial Reporting Summary, Washington State School Districts and Educational Service Districts, Fiscal Year 9/2011-8/2012. The estimated per-pupil annual cost equals 10% of the total per-pupil expenditures reported in Table 7. <http://www.k12.wa.us/safs/PUB/FIN/1112/2011-12%20Financial%20Reporting%20Summary.pdf>

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	5	40	1000	0.101	0.042	16	0.101	0.042	20	0.101	0.050
Test scores	5	40	1000	0.120	0.055	16	0.109	0.047	18	0.120	0.050

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Class size: reducing average class size by one student in grade 2 Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing 2nd grade average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$169	Benefit to cost ratio	\$3.05
Participants	\$393	Benefits minus costs	\$446
Others	\$210	Chance the program will produce	
Indirect	(\$108)	benefits greater than the costs	67 %
<u>Total benefits</u>	<u>\$664</u>		
<u>Net program cost</u>	<u>(\$218)</u>		
Benefits minus cost	\$446		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$1	\$3	\$1	\$4
Labor market earnings associated with test scores	\$393	\$167	\$208	\$0	\$769
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$109)	(\$109)
<b>Totals</b>	<b>\$393</b>	<b>\$169</b>	<b>\$210</b>	<b>(\$108)</b>	<b>\$664</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

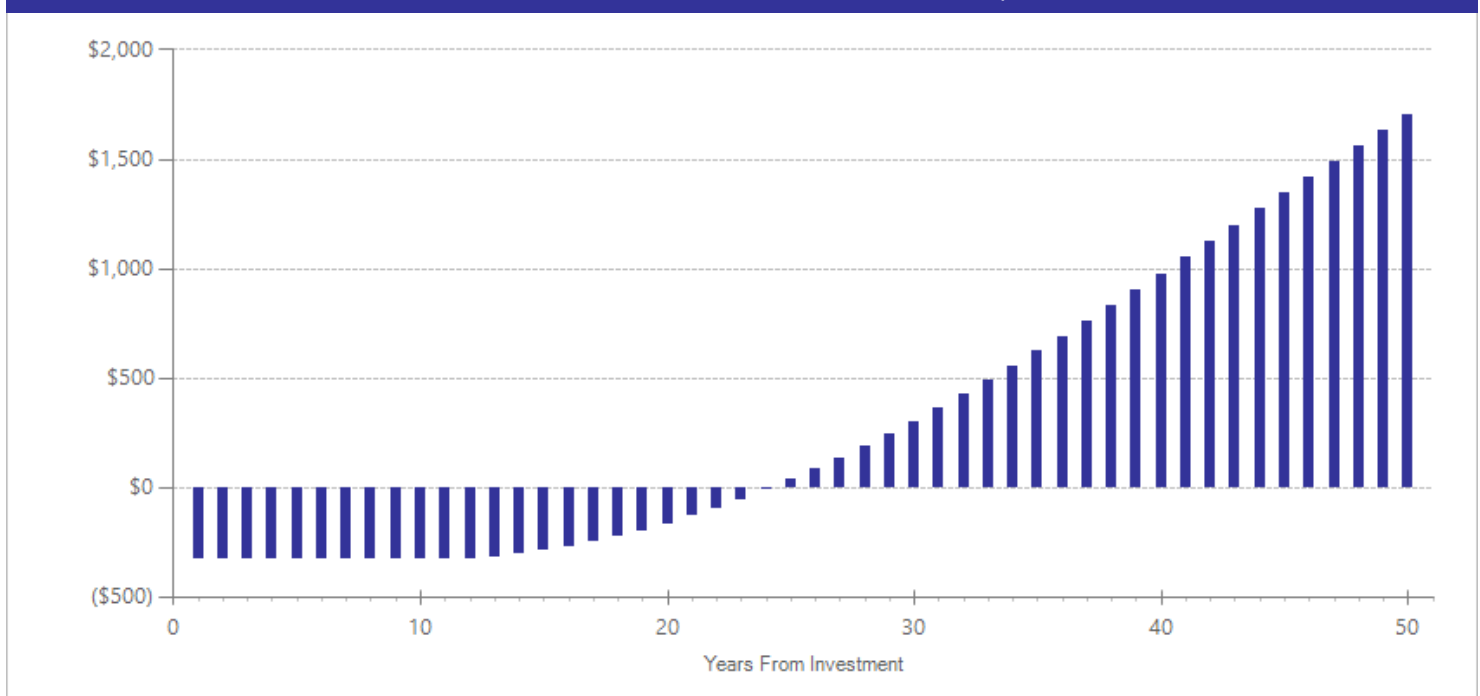
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$198	2011	Present value of net program costs (in 2018 dollars)	(\$218)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	7	77	1000	0.005	0.004	7	0.005	0.004	18	0.005	0.204
Test scores	7	77	1000	0.010	0.009	7	0.005	0.005	17	0.010	0.286

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

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## Second Step Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated May 2015.

Program Description: Second Step is a classroom-based social skills program for reducing aggressive behavior in elementary school-aged children. Second Step focuses on teaching social-emotional competencies and self-regulation skills including nonviolent response techniques. Lessons are taught by a trained teacher in a classroom setting.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$203	Benefit to cost ratio	\$4.50
Participants	\$103	Benefits minus costs	\$436
Others	\$189	Chance the program will produce	
Indirect	\$66	benefits greater than the costs	78 %
<u>Total benefits</u>	<u>\$561</u>		
<u>Net program cost</u>	<u>(\$125)</u>		
Benefits minus cost	\$436		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$14	\$31	\$7	\$52
Labor market earnings associated with high school graduation	\$79	\$34	\$43	\$43	\$200
K-12 grade repetition	\$0	\$0	\$0	\$0	\$0
K-12 special education	\$0	\$47	\$0	\$23	\$70
Health care associated with externalizing behavior symptoms	\$32	\$114	\$118	\$57	\$321
Costs of higher education	(\$8)	(\$5)	(\$2)	(\$3)	(\$19)
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$62)	(\$62)
<b>Totals</b>	<b>\$103</b>	<b>\$203</b>	<b>\$189</b>	<b>\$66</b>	<b>\$561</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

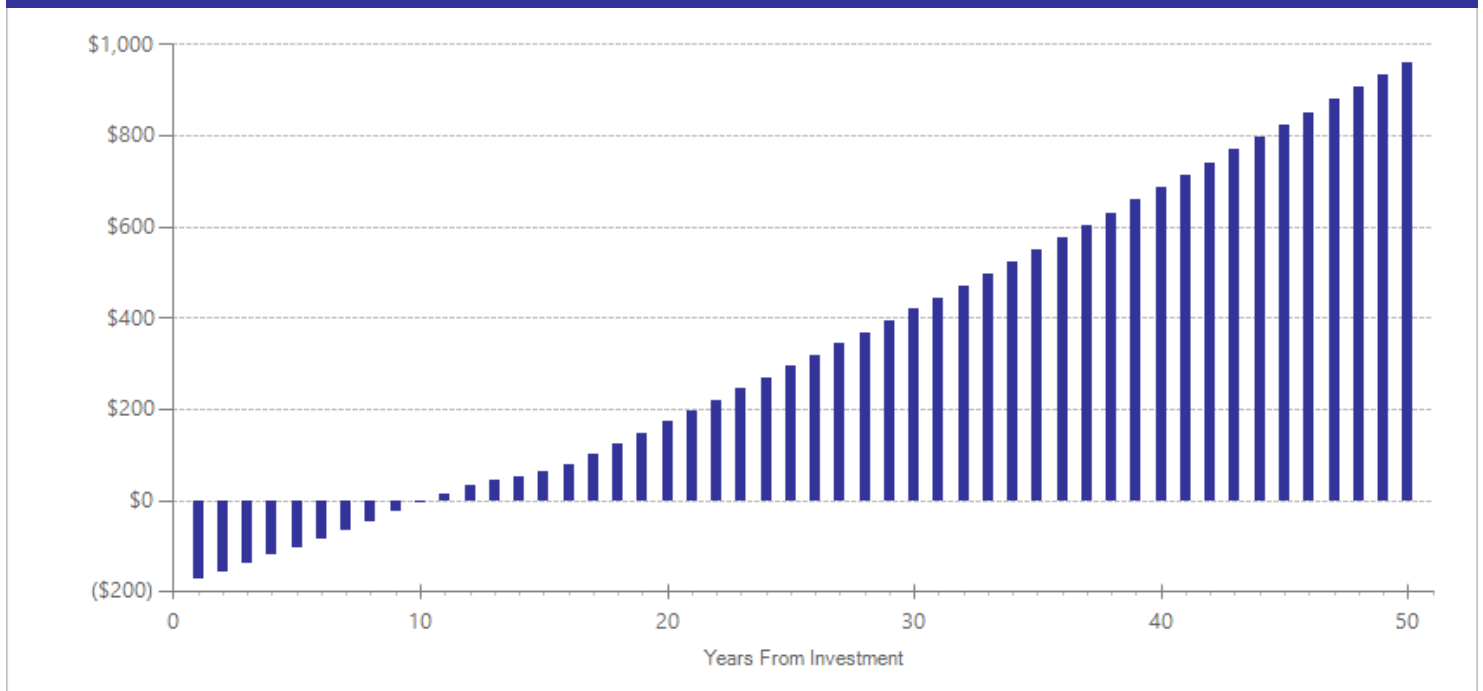
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$117	2013	Present value of net program costs (in 2018 dollars)	(\$125)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

To estimate costs, we assume that teachers spend an average of 15 hours teaching Second Step lessons (30 sessions of 30 minutes) and attend a two-day training. To estimate a per-student annual cost, we calculated the value of teacher time using average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction and divide by the number of students in a prototypical elementary school. The estimate also includes curriculum cost as reported by Second Step (<https://store.cfchildren.org/elementary-kindergarten--grade-5-c29.aspx>) and registration costs for teachers to attend two days of training (<http://legacy.nreppadmin.net/ViewIntervention.aspx?id=66>).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Attention-deficit/hyperactivity disorder symptoms	6	1	3637	-0.108	0.024	6	0.000	0.141	7	-0.108	0.001
Externalizing behavior symptoms	6	3	4214	-0.060	0.041	7	-0.033	0.028	10	-0.060	0.172
School attendance <sup>^</sup>	6	1	1074	0.203	0.144	10	n/a	n/a	n/a	0.203	0.159
Suspensions/expulsions <sup>^</sup>	6	1	1074	0.028	0.144	10	n/a	n/a	n/a	0.028	0.849

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Class size: reducing average class size by one student in grade 3 Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing 3rd grade average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$138	Benefit to cost ratio	\$2.40
Participants	\$321	Benefits minus costs	\$304
Others	\$172	Chance the program will produce	
Indirect	(\$108)	benefits greater than the costs	61 %
<u>Total benefits</u>	<u>\$522</u>		
<u>Net program cost</u>	<u>(\$218)</u>		
Benefits minus cost	\$304		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$1	\$2	\$0	\$3
Labor market earnings associated with test scores	\$321	\$137	\$169	\$0	\$628
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$109)	(\$109)
<b>Totals</b>	<b>\$321</b>	<b>\$138</b>	<b>\$172</b>	<b>(\$108)</b>	<b>\$522</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

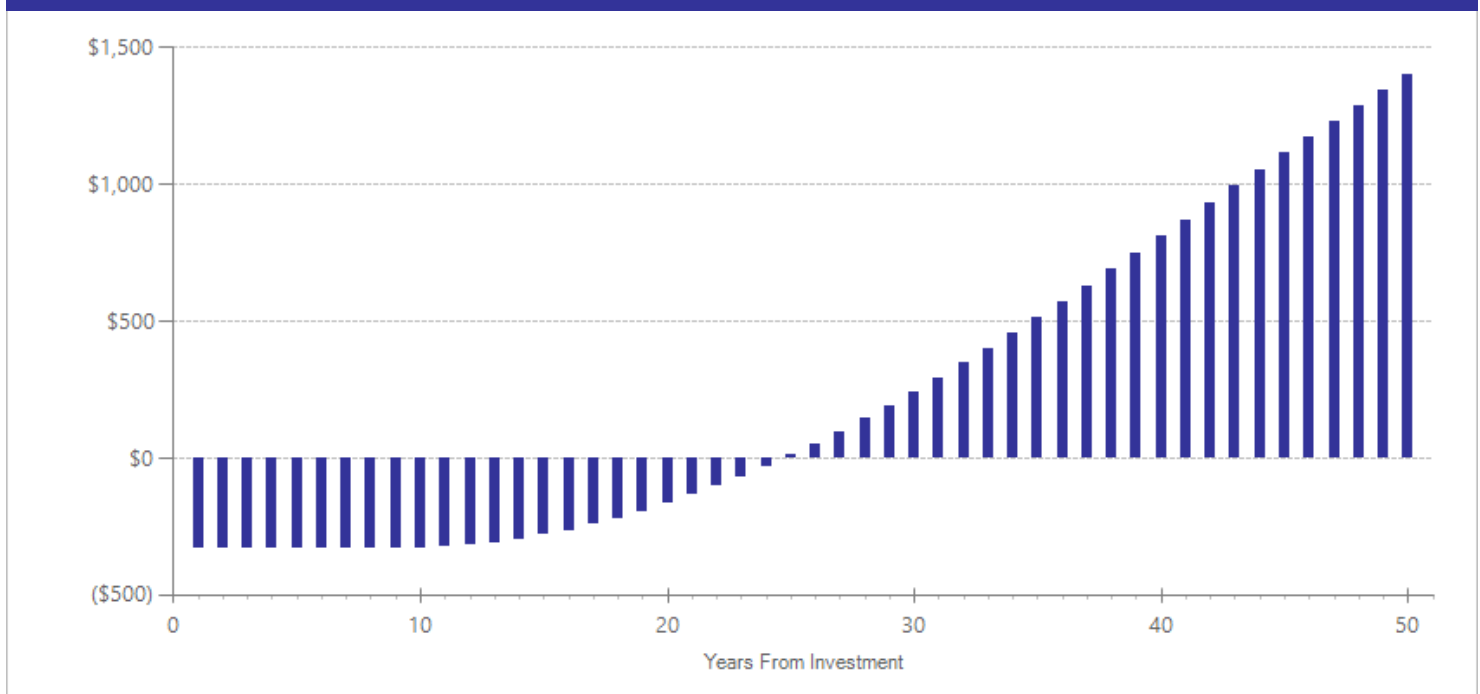
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$198	2011	Present value of net program costs (in 2018 dollars)	(\$218)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	8	77	1000	0.004	0.004	8	0.004	0.004	18	0.004	0.317
Test scores	8	77	1000	0.007	0.009	8	0.004	0.005	17	0.007	0.452

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Class size: reducing average class size by one student in one grade, 4-6 Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 27 students in grades 4-6 (RCW 28A.150.260). We estimate the benefits and costs of reducing 4th-6th grade average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$108	Benefit to cost ratio	\$2.00
Participants	\$251	Benefits minus costs	\$198
Others	\$134	Chance the program will produce	
Indirect	(\$98)	benefits greater than the costs	55 %
<hr/> Total benefits	<hr/> \$394		
Net program cost	(\$197)		
Benefits minus cost	\$198		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

#### Benefits from changes to:<sup>1</sup>

#### Benefits to:

	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$1	\$2	\$0	\$3
Labor market earnings associated with test scores	\$251	\$107	\$132	\$0	\$490
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$98)	(\$98)
<hr/> Totals	<hr/> \$251	<hr/> \$108	<hr/> \$134	<hr/> (\$98)	<hr/> \$394

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

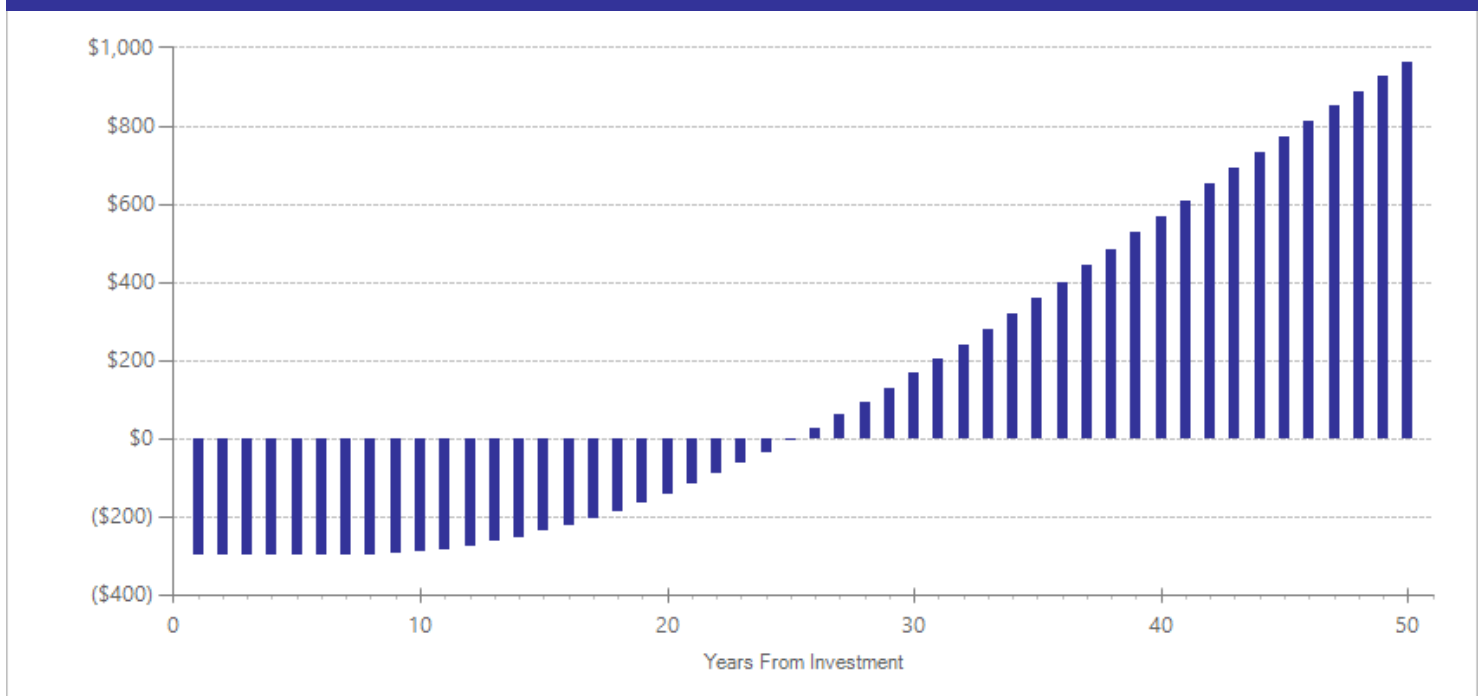
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$179	2011	Present value of net program costs (in 2018 dollars)	(\$197)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs were calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
High school graduation	10	77	1000	0.003	0.003	10	0.003	0.003	18	0.003	0.431
Test scores	10	77	1000	0.004	0.008	10	0.003	0.006	17	0.004	0.621

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## Class size: reducing average class size by one student in one grade, 9-12 Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 28.74 students in grades 9 through 12 (RCW 28A.150.260). We estimate the benefits and costs of reducing high school average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$94	Benefit to cost ratio	\$1.96
Participants	\$221	Benefits minus costs	\$169
Others	\$118	Chance the program will produce	
Indirect	(\$88)	benefits greater than the costs	53 %
<u>Total benefits</u>	<u>\$345</u>		
<u>Net program cost</u>	<u>(\$176)</u>		
Benefits minus cost	\$169		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

#### Benefits from changes to:<sup>1</sup>

#### Benefits to:

	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$0	\$1	\$0	\$2
Labor market earnings associated with test scores	\$221	\$94	\$116	\$0	\$431
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$88)	(\$88)
<b>Totals</b>	<b>\$221</b>	<b>\$94</b>	<b>\$118</b>	<b>(\$88)</b>	<b>\$345</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

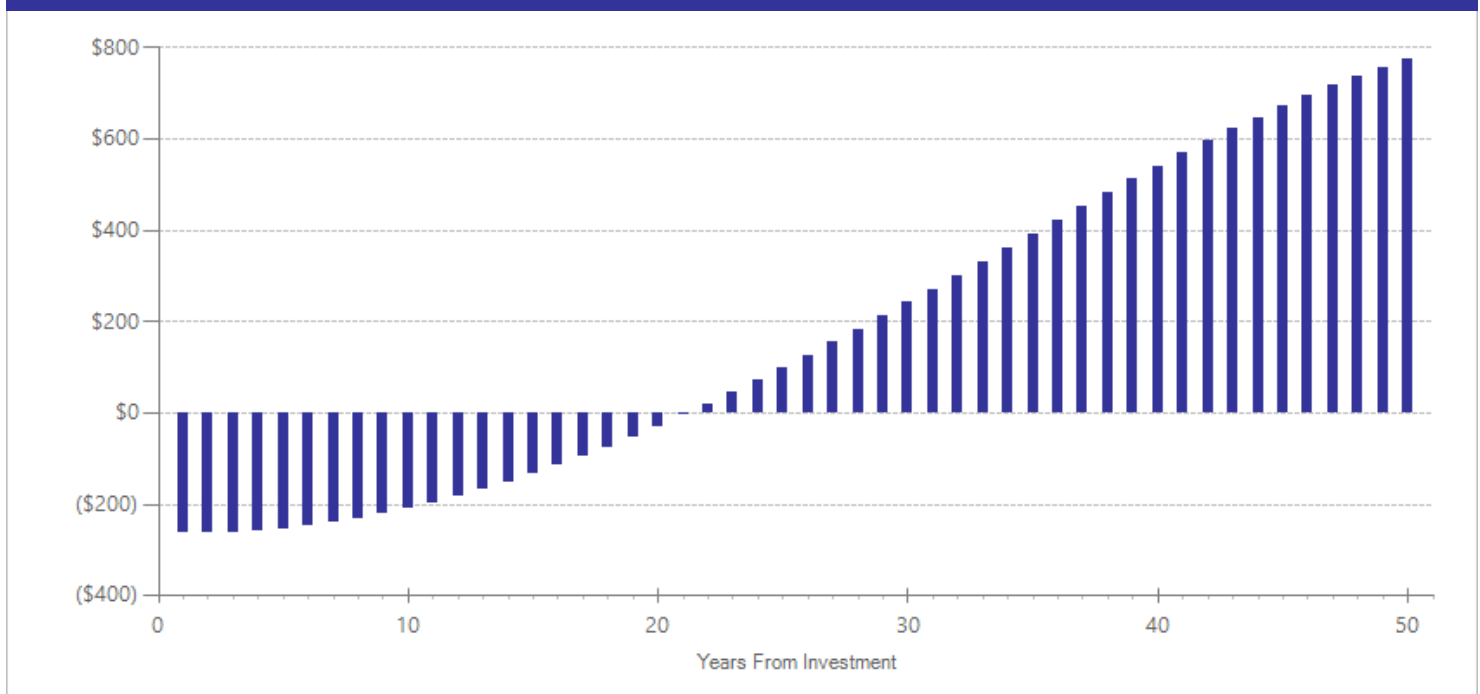
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$160	2011	Present value of net program costs (in 2018 dollars)	(\$176)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	16	77	1000	0.002	0.003	16	0.002	0.003	18	0.002	0.583
Test scores	16	77	1000	0.002	0.008	16	0.002	0.007	17	0.002	0.781

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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## Class size: reducing average class size by one student in one grade, 7-8 Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 28.53 students in grades 7 and 8 (RCW 28A.150.260). We estimate the benefits and costs of reducing 7th and 8th grade average class sizes by one student.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$93	Benefit to cost ratio	\$1.90
Participants	\$217	Benefits minus costs	\$160
Others	\$116	Chance the program will produce	
Indirect	(\$89)	benefits greater than the costs	52 %
<hr/> Total benefits	<hr/> \$338		
Net program cost	(\$178)		
Benefits minus cost	\$160		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

#### Benefits from changes to:<sup>1</sup>

#### Benefits to:

	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$1	\$1	\$0	\$2
Labor market earnings associated with test scores	\$217	\$93	\$115	\$0	\$425
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$89)	(\$89)
<hr/> Totals	<hr/> \$217	<hr/> \$93	<hr/> \$116	<hr/> (\$89)	<hr/> \$338

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.



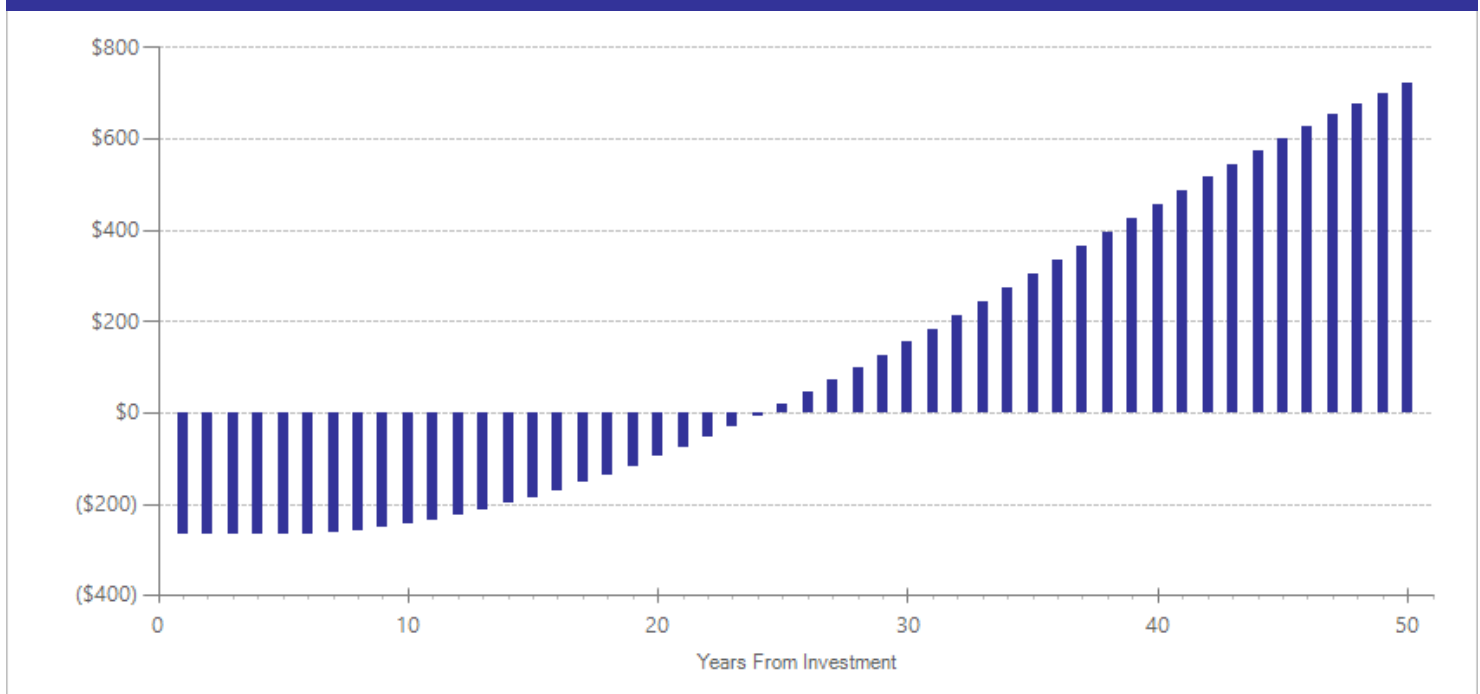
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$162	2011	Present value of net program costs (in 2018 dollars)	(\$178)
Comparison costs	\$0	2011	Cost range (+ or -)	0 %

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	13	77	1000	0.002	0.003	13	0.002	0.003	18	0.002	0.532
Test scores	13	77	1000	0.003	0.008	13	0.002	0.006	17	0.003	0.723

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Teacher professional development: Not targeted

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: Generally, professional development (PD) for K–12 teachers includes activities such as workshops, conferences, summer institutes, and time set aside during the school year for staff development. The evaluations included in this analysis examine impacts on student outcomes from providing more time and funding for teacher PD without directing how those resources are used.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$6	Benefit to cost ratio	(\$0.22)
Participants	\$13	Benefits minus costs	(\$112)
Others	\$7	Chance the program will produce	
Indirect	(\$46)	benefits greater than the costs	37 %
<b>Total benefits</b>	<b>(\$20)</b>		
<b>Net program cost</b>	<b>(\$92)</b>		
<b>Benefits minus cost</b>	<b>(\$112)</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$13	\$6	\$7	\$0	\$26
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$46)	(\$46)
<b>Totals</b>	<b>\$13</b>	<b>\$6</b>	<b>\$7</b>	<b>(\$46)</b>	<b>(\$20)</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

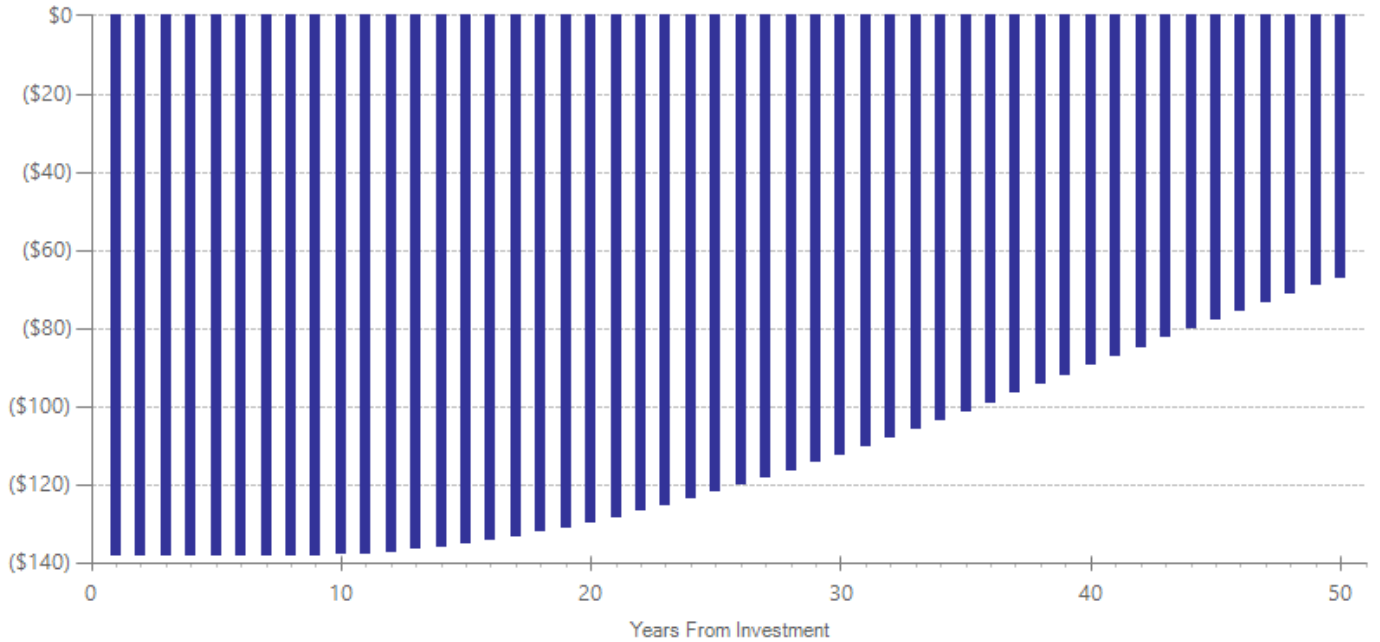
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$86	2013	Present value of net program costs (in 2018 dollars)	(\$92)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in the meta-analysis, teachers received an average of 20 additional hours of non-targeted professional development (PD) in comparison with the usual amount of PD time. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs to account for the overhead (i.e. facility and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	12	461497	0.000	0.002	11	0.000	0.002	17	0.000	0.996

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Full-day kindergarten

## Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated December 2013.

Program Description: In this analysis, we compare the effects of full day kindergarten programs with the effects of half day kindergarten among public school students.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$417	Benefit to cost ratio	\$0.17
Participants	\$979	Benefits minus costs	(\$2,381)
Others	\$516	Chance the program will produce	
Indirect	(\$1,431)	benefits greater than the costs	38 %
<b>Total benefits</b>	<b>\$481</b>		
<b>Net program cost</b>	<b>(\$2,862)</b>		
<b>Benefits minus cost</b>	<b>(\$2,381)</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	\$979	\$417	\$516	\$0	\$1,912
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$1,431)	(\$1,431)
<b>Totals</b>	<b>\$979</b>	<b>\$417</b>	<b>\$516</b>	<b>(\$1,431)</b>	<b>\$481</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

### Detailed Annual Cost Estimates Per Participant

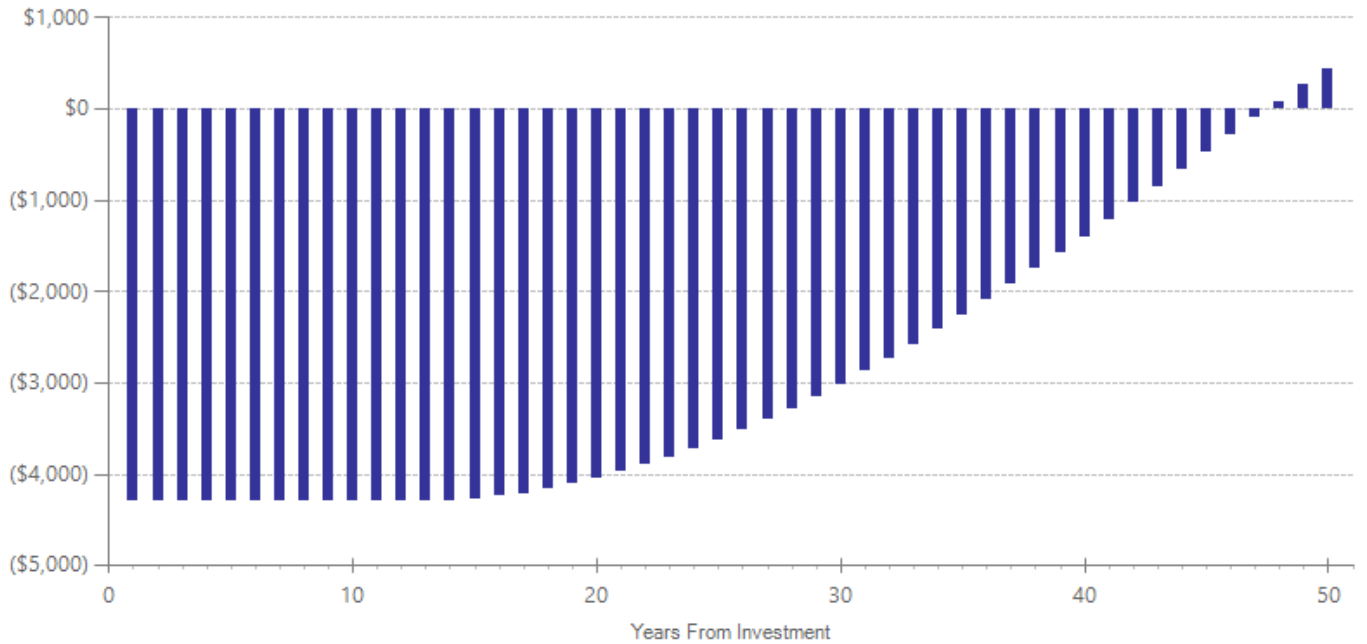
	Annual cost	Year dollars	Summary	
Program costs	\$3,151	2012	Present value of net program costs (in 2018 dollars)	(\$2,862)
Comparison costs	\$505	2012	Cost range (+ or -)	10 %

Treatment costs are the increased cost to provide full-day kindergarten rather than half-day kindergarten including twice the staff costs and additional classroom space. We estimated the construction costs of new classrooms based on a kindergarten class size of twenty, 90 square foot of space per student and \$188.55 (2012 dollars) of construction costs per square foot; We estimated that 50% of the comparison group students who were eligible would use a half day of child care subsidies. We estimated that 48.91% of students would be eligible for child care subsidies based on the number of students eligible for free and reduced-priced meals (Office of Superintendent of Public Instruction. (2012). 2012-2013 Washington Public School Free and Reduced-Price Meal Eligibility. <http://k12.wa.us/ChildNutrition/Reports/FreeReducedMeals.aspx> and Department of Early Learning. (2013). Child Care Subsidy Rates. <http://www.del.wa.gov/publications/subsidy/docs/ChildCareSubsidyRates.pdf>)

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).



## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	5	2	23127	0.022	0.091	8	0.012	0.068	17	0.022	0.812

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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## "Check-in" behavior interventions

### Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated May 2015.

Program Description: Check-in behavior interventions provide support for at-risk students in grades K–12 in order to reduce dropouts, promote engagement at school, and reduce problem behaviors. Typically, students must check-in with a designated adult at the school each day. The designated adult collects and monitors data on at-risk indicators (e.g. tardiness, absenteeism, discipline referrals, and poor grades); provides feedback and mentoring; facilitates individualized interventions as appropriate; and ensures communication with parents. The programs included in this analysis are (in no particular order) Check-In, Check-Out (also known as the Behavior Education Program); Check and Connect; and Check, Connect, and Expect.

#### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	(\$90)	Benefit to cost ratio	(\$1.20)
Participants	(\$810)	Benefits minus costs	(\$3,078)
Others	(\$219)	Chance the program will produce	
Indirect	(\$561)	benefits greater than the costs	47 %
<b>Total benefits</b>	<b>(\$1,680)</b>		
<b>Net program cost</b>	<b>(\$1,398)</b>		
<b>Benefits minus cost</b>	<b>(\$3,078)</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

#### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$22	\$50	\$11	\$83
Labor market earnings associated with test scores	(\$860)	(\$366)	(\$454)	\$0	(\$1,680)
K-12 grade repetition	\$0	\$3	\$0	\$1	\$4
K-12 special education	\$0	\$73	\$0	\$36	\$109
Health care associated with externalizing behavior symptoms	\$50	\$178	\$184	\$89	\$502
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$699)	(\$699)
<b>Totals</b>	<b>(\$810)</b>	<b>(\$90)</b>	<b>(\$219)</b>	<b>(\$561)</b>	<b>(\$1,680)</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

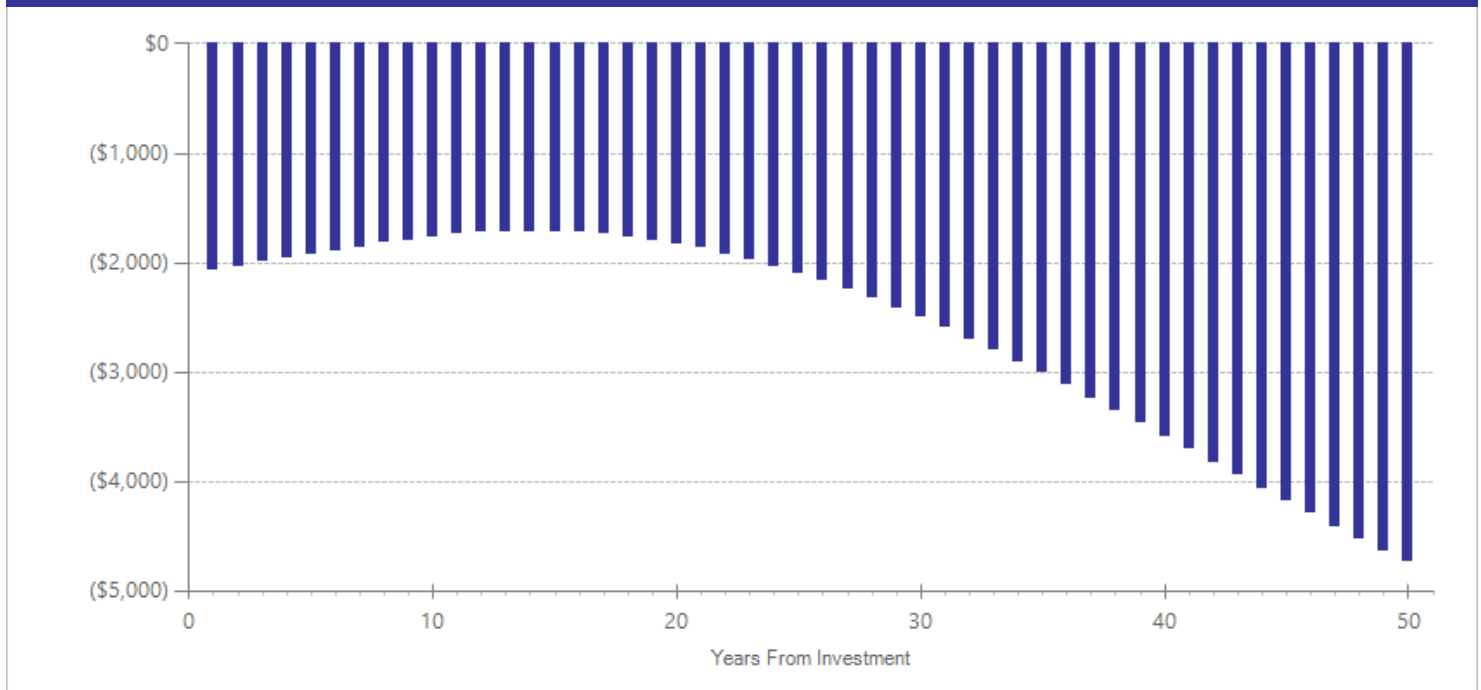
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$1,329	2014	Present value of net program costs (in 2018 dollars)	(\$1,398)
Comparison costs	\$0	2014	Cost range (+ or -)	30 %

Costs for check-in programs can vary depending on the type and intensity of the intervention. To calculate a per-student annual cost, we use the average between a minimal check-in program facilitated by a paraprofessional serving a caseload of up to 15 students and a more intensive program facilitated by a school counselor with a caseload of up to 35 students. We use average Washington State compensation costs (including benefits) for K-12 staff as reported by the Office of the Superintendent of Public Instruction and include training time in our estimate. Program implementation details are based in part on information provided by the following sources: National Center on Intensive Intervention. (n.d.) Behavior Education Program (BEP) or Check-in/Check-out (CICO). Retrieved from <http://www.intensiveintervention.org/chart/behavioral-intervention-chart> and Coalition for Evidence-Based Policy. (2015). Check and Connect. Retrieved from <http://evidencebasedprograms.org/1366-2/check-and-connect>.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Externalizing behavior symptoms	8	1	121	-0.094	0.209	9	-0.052	0.127	12	-0.218	0.298
Grade point average <sup>^</sup>	8	1	89	0.070	0.146	15	n/a	n/a	n/a	0.070	0.633
Internalizing symptoms	8	1	121	-0.140	0.209	9	-0.140	0.209	11	-0.325	0.122
Office discipline referrals <sup>^</sup>	8	2	116	-0.276	0.143	15	n/a	n/a	n/a	-0.276	0.054
School attendance <sup>^</sup>	8	1	89	0.010	0.146	15	n/a	n/a	n/a	0.010	0.945
Test scores	8	1	121	-0.016	0.209	9	-0.010	0.230	17	-0.037	0.858

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Educator professional development: Use of data to guide instruction Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated June 2014.

Program Description: One form of professional development (PD) involves training senior/mentoring/coaching teachers how to use student academic assessment data to modify and improve instruction. In this "train the trainers" approach, teacher-leaders directly receive the training and then share what they have learned with classroom teachers. This type of PD is usually paired with computer software that tracks and reports student assessment data to teachers. The specific types of assessments and software evaluated and included in this meta-analysis are (in no particular order) Individualized Student Instruction (ISI) using A2i software and Ohio's Personalized Assessment Reporting System (PARS).

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	(\$784)	Benefit to cost ratio	(\$189.79)
Participants	(\$1,841)	Benefits minus costs	(\$3,624)
Others	(\$971)	Chance the program will produce	
Indirect	(\$9)	benefits greater than the costs	31 %
<u>Total benefits</u>	<u>(\$3,605)</u>		
<u>Net program cost</u>	<u>(\$19)</u>		
Benefits minus cost	(\$3,624)		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	(\$1,841)	(\$784)	(\$971)	\$0	(\$3,595)
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$9)	(\$9)
<b>Totals</b>	<b>(\$1,841)</b>	<b>(\$784)</b>	<b>(\$971)</b>	<b>(\$9)</b>	<b>(\$3,605)</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

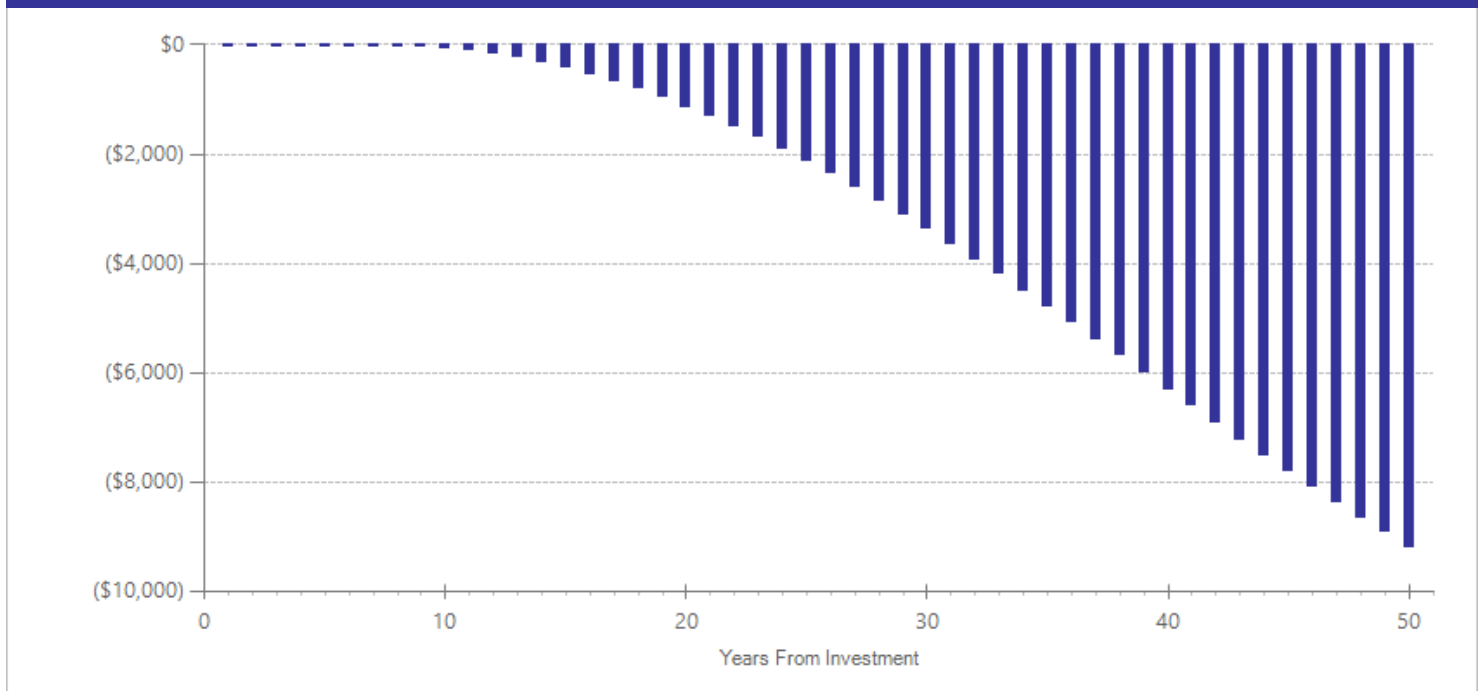
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$18	2013	Present value of net program costs (in 2018 dollars)	(\$19)
Comparison costs	\$0	2013	Cost range (+ or -)	10 %

In the evaluations included in this meta-analysis, educators received an average of three hours of training in how to use student assessment data to guide instruction. We calculated the value of PD time using average teacher salaries (including benefits) as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and added per-student materials, supplies, and operating costs to account for the overhead (i.e. facility, computer, and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated			ES	p-value
				ES	SE	Age	ES	SE	Age		
Test scores	10	2	26047	-0.030	0.036	10	-0.020	0.040	17	-0.030	0.409

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

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## Even Start Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated April 2012.

Program Description: Even Start is a federally-funded program that provides early childhood education, adult education (including basic education and/or instruction for English language learners), parenting education, and parent-child literacy activities to low-income families with young children.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	(\$671)	Benefit to cost ratio	(\$1.19)
Participants	(\$1,577)	Benefits minus costs	(\$9,812)
Others	(\$832)	Chance the program will produce	
Indirect	(\$2,244)	benefits greater than the costs	32 %
<b>Total benefits</b>	<b>(\$5,324)</b>		
<b>Net program cost</b>	<b>(\$4,488)</b>		
<b>Benefits minus cost</b>	<b>(\$9,812)</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Labor market earnings associated with test scores	(\$1,577)	(\$671)	(\$832)	\$0	(\$3,080)
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$2,244)	(\$2,244)
<b>Totals</b>	<b>(\$1,577)</b>	<b>(\$671)</b>	<b>(\$832)</b>	<b>(\$2,244)</b>	<b>(\$5,324)</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

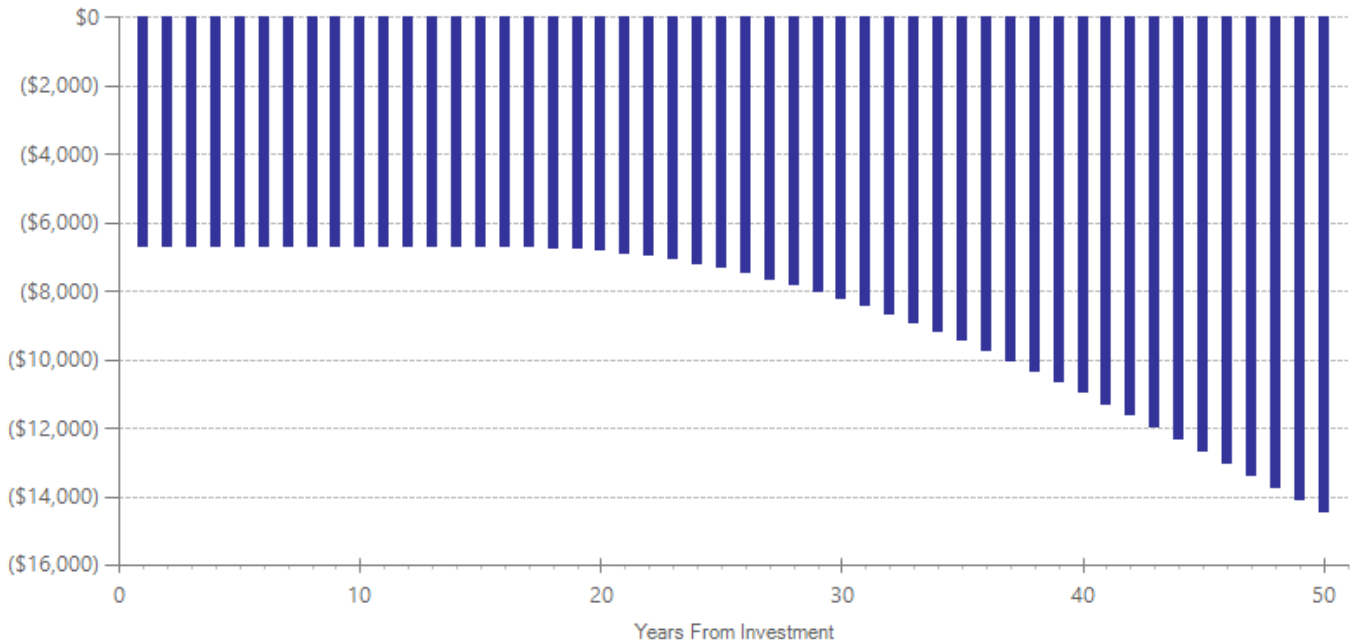
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$4,708	2001	Present value of net program costs (in 2018 dollars)	(\$4,488)
Comparison costs	\$1,679	2010	Cost range (+ or -)	10 %

Families typically participate in Even Start for a year or less. Per-family costs from St. Pierre, R.G., Ricciuti, A., Tao, F., Creps, C., Swartz, J., Lee, W., Parsad, A., & Rimdzius, T. (2003). *Third National Even Start Evaluation: Program impacts and implications for improvement*. Cambridge, MA. Abt Associates, Inc.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	Primary or secondary participant	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
					First time ES is estimated			Second time ES is estimated				
					ES	SE	Age	ES	SE	Age	ES	p-value
Test scores	1	Primary	2	183	-0.051	0.142	6	-0.021	0.156	17	-0.051	0.718
Adult literacy <sup>^</sup>	29	Secondary	2	234	0.006	0.124	31	n/a	n/a	n/a	0.006	0.961
Employment <sup>^^</sup>	29	Secondary	2	234	0.004	0.216	31	n/a	n/a	n/a	0.004	0.984
GED attainment <sup>^</sup>	29	Secondary	2	249	0.074	0.234	31	n/a	n/a	n/a	0.074	0.753

<sup>^</sup>WSIPP’s benefit-cost model does not monetize this outcome.

<sup>^^</sup>WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

## Citations Used in the Meta-Analysis

- St. Pierre, R., Ricciuti, A., Tao, F., Creps, C., Swartz, J., Lee, W., . . . Rimdzius, T. (2003). *Third national Even Start evaluation: Program impacts and implications for improvement*. Cambridge: Abt Associates.
- St. Pierre, R., Swartz, J., Gamse, B., Murray, S., Deck, D., & Nickel, P. (1995). *National evaluation of the Even Start Family Literacy Program*. Cambridge: Abt Associates.

## Early Head Start Pre-K to 12 Education

Benefit-cost estimates updated December 2019. Literature review updated April 2012.

Program Description: Early Head Start is a federally-funded program for low-income pregnant women and families with infants or toddlers that aims to enhance children's development and health and strengthen families. Families can receive services until the children are three years old. Early Head Start accounts for 10% of the Head Start budget; program providers determine the specific services offered following Head Start guidelines.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	\$3,305	Benefit to cost ratio	\$0.02
Participants	\$788	Benefits minus costs	(\$11,332)
Others	\$450	Chance the program will produce	
Indirect	(\$4,336)	benefits greater than the costs	29 %
<u>Total benefits</u>	<u>\$207</u>		
<u>Net program cost</u>	<u>(\$11,539)</u>		
Benefits minus cost	(\$11,332)		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: <sup>1</sup>	Benefits to:				
	Participants	Taxpayers	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	\$0	\$0	\$0	\$0	\$0
Labor market earnings associated with test scores	\$561	\$239	\$296	\$0	\$1,096
K-12 grade repetition	\$0	\$49	\$0	\$24	\$73
K-12 special education	\$0	\$1,803	\$0	\$902	\$2,705
Health care associated with externalizing behavior symptoms	\$20	\$70	\$73	\$35	\$198
<b>Subtotals</b>	<b>\$581</b>	<b>\$2,161</b>	<b>\$369</b>	<b>\$961</b>	<b>\$4,072</b>
From secondary participant					
Labor market earnings associated with major depression	\$495	\$211	\$0	\$0	\$706
Health care associated with major depression	\$22	\$79	\$82	\$40	\$222
Public assistance	(\$312)	\$854	\$0	\$427	\$969
Mortality associated with depression	\$1	\$0	\$0	\$6	\$7
<b>Subtotals</b>	<b>\$207</b>	<b>\$1,144</b>	<b>\$82</b>	<b>\$472</b>	<b>\$1,904</b>
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$5,769)	(\$5,769)
<b>Totals</b>	<b>\$788</b>	<b>\$3,305</b>	<b>\$450</b>	<b>(\$4,336)</b>	<b>\$207</b>

<sup>1</sup>In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

<sup>2</sup>"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

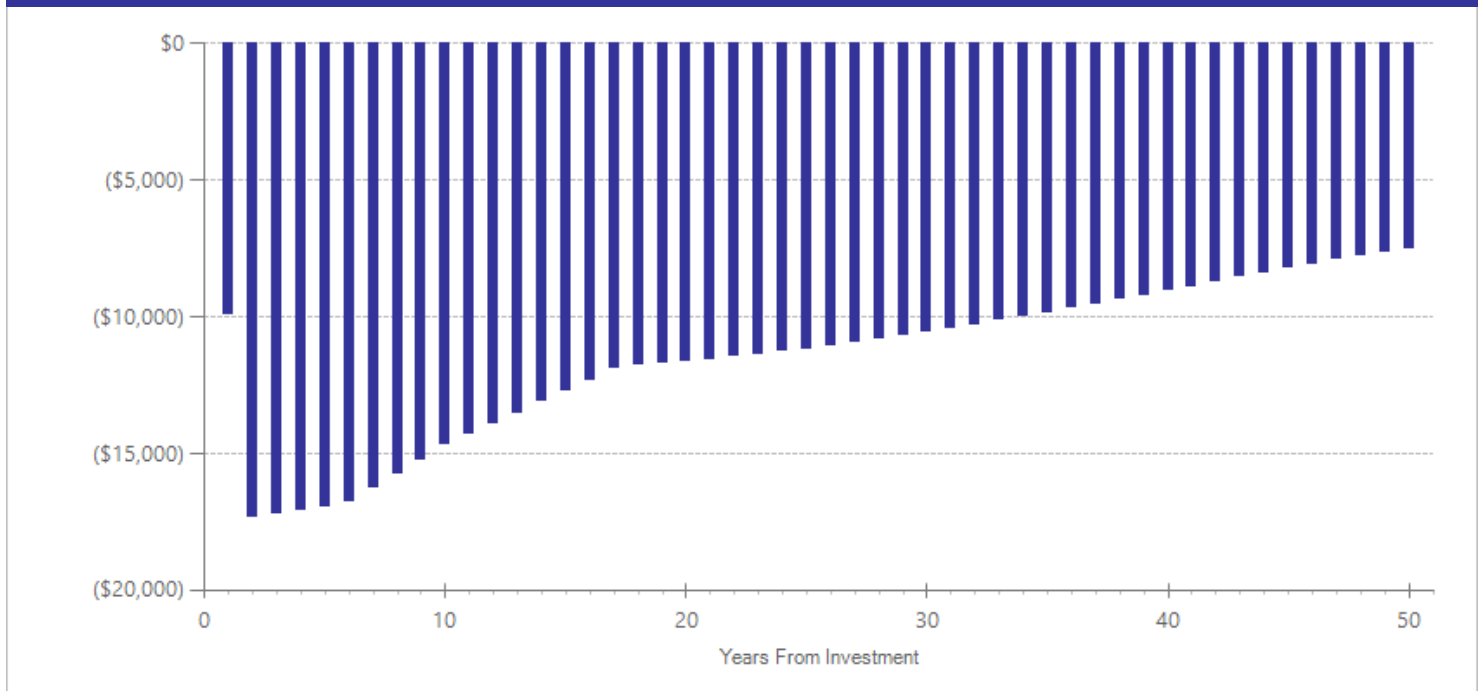
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$7,600	2010	Present value of net program costs (in 2018 dollars)	(\$11,539)
Comparison costs	\$1,679	2010	Cost range (+ or -)	10 %

Families who participate in Early Head Start typically participate for 1.75 years. Per-family costs from the US Department of Health and Human Services, Administration for Children & Families, FY 2010.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

## Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

## Meta-Analysis of Program Effects

Outcomes measured	Treatment age	Primary or secondary participant	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
					First time ES is estimated			Second time ES is estimated			ES	p-value
					ES	SE	Age	ES	SE	Age		
Crime	1	Primary	1	842	0.000	0.050	10	0.000	0.050	20	0.000	1.000
Externalizing behavior symptoms	1	Primary	1	842	-0.038	0.050	10	-0.021	0.031	13	-0.038	0.447
Internalizing symptoms	1	Primary	1	842	-0.052	0.050	10	-0.052	0.050	12	-0.052	0.296
K-12 grade repetition	1	Primary	1	842	-0.041	0.088	10	-0.041	0.088	17	-0.041	0.637
K-12 special education	1	Primary	1	842	-0.093	0.081	10	-0.093	0.081	17	-0.093	0.252
Test scores	1	Primary	1	842	0.011	0.052	10	0.007	0.057	17	0.011	0.827
Employment <sup>^^</sup>	20	Secondary	1	842	0.000	0.050	29	n/a	n/a	n/a	0.000	1.000
Major depressive disorder	20	Secondary	1	842	-0.045	0.050	29	-0.023	0.274	31	-0.045	0.364
Public assistance	20	Secondary	1	842	-0.073	0.060	29	-0.073	0.060	39	-0.073	0.224
Substance use disorder <sup>^</sup>	20	Secondary	1	842	-0.008	0.112	29	n/a	n/a	n/a	-0.008	0.940
Years of education	20	Secondary	1	842	0.000	0.050	29	0.000	0.050	39	0.000	1.000

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

<sup>^^</sup>WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

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## Citations Used in the Meta-Analysis

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# Charter schools: overall impact

## Pre-K to 12 Education

Literature review updated August 2013.

Program Description: A charter school is a public school governed under a “charter,” or contract, between the group operating the school and an authorizing agency, typically a state or local jurisdiction. Charter schools are often exempt from some state or local rules and regulations but must meet accountability standards articulated in its charter. The studies included in this analysis measure the impact of attending a charter school compared to a traditional public school. We present the findings for reading scores here.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	65	1597623	0.013	0.007	12	0.013	0.057

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# Academic vocabulary instruction

## Pre-K to 12 Education

Literature review updated March 2018.

Program Description: Academic Vocabulary Instruction is a structured approach to teaching specialized vocabulary words that appear frequently in expository, informational, and academic texts across disciplines (especially in secondary grades) but that are not commonly used in spoken English, such as hypothesis, generate, and domain. The program included in this analysis (Academic Language Instruction for All Students, or ALIAS) was designed for use in classrooms with low performance in English Language Arts and high numbers of English Language Learners. The program provided daily lessons to middle school students over 20 weeks, covered 70 vocabulary words, and provided teachers with materials and monthly implementation support meetings.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	1	971	0.019	0.044	11	0.043	0.326

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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## Citations Used in the Meta-Analysis

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# Pre-K and elementary bilingual instruction for English language learners

## Pre-K to 12 Education

Literature review updated June 2014.

Program Description: Bilingual instructional programs provide English language learner (ELL) students with classroom instruction partially in their native language and partially in English. The evaluations included in this analysis compare programs that use bilingual instruction to those in which instruction is conducted entirely in English, such as English as a Second Language (ESL) teaching strategies.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	21	58227	0.014	0.006	9	0.014	0.016

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Charter schools: urban charter schools

## Pre-K to 12 Education

Literature review updated August 2013.

Program Description: Charter schools have traditionally been located in cities; many are designed to serve minority students in high-poverty areas. A body of literature suggests that charter schools located in urban areas may be more effective than charters located outside of the urban core. The studies in this analysis measure the impact of attending a charter school compared to a traditional public school in urban areas. The analysis includes findings from specific cities (e.g. New York or Chicago), as well as statewide studies that examine impacts by urbanicity. We present the findings for reading scores here.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	38	339551	0.044	0.013	12	0.044	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Daily Behavior Report Cards

## Pre-K to 12 Education

Literature review updated April 2018.

Program Description: Daily behavior report cards (DBRC) are a systematic method of communicating with parents about a student's behavior in school. Typically, teachers identify students exhibiting behavior problems for participation. The report cards are sent home with the child or electronically, and the student must return the form the following morning with the parent's signature. Behavioral reinforcements or consequences are delivered to students by parents or teachers and are selected based on the individual child. In this analysis, teachers issued electronic report cards to students in 3rd grade over a three-week period, and parents issued behavioral rewards or consequences.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Attention-deficit/hyperactivity disorder symptoms	1	31	-0.065	0.340	8	-0.284	0.405
Externalizing behavior symptoms	1	31	-0.158	0.340	8	-0.685	0.049
Internalizing symptoms	1	31	-1.070	0.359	8	-1.070	0.003

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WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Principal quality Pre-K to 12 Education

Literature review updated August 2013.

Program Description: Do school principals directly affect student academic outcomes? The studies in this analysis use a "fixed effects" statistical approach to examine variation in principal quality. The studies focus on principals that move from one school to another; impacts on student outcomes can be estimated for different principals in the same school. The effects presented here represent the impact on test scores from a principal who is one standard deviation above average principal effectiveness.

Meta-Analysis of Program Effects							
Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	6	2580828	0.107	0.020	11	0.107	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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# Charter schools: Knowledge Is Power Program (KIPP)

## Pre-K to 12 Education

Literature review updated August 2013.

Program Description: The Knowledge Is Power Program (KIPP) is a network of public charter schools operating in 20 states and the District of Columbia. The schools predominantly enroll low-income and minority students. The studies included in this analysis are of KIPP middle schools around the country and measure the impact of attending a KIPP school compared to a traditional public school. The evidence suggests that KIPP charter schools improve test scores in both reading and math. We present the findings for reading scores here.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	9	16665	0.053	0.011	11	0.053	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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## Citations Used in the Meta-Analysis

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# National Board for Professional Teaching Standards (NBPTS) certified teachers (for elementary school students)

Pre-K to 12 Education

Literature review updated March 2018.

**Program Description:** The National Board for Professional Teaching Standards (NBPTS) certification is an advanced teaching credential that complements (and does not replace) state certification. This analysis estimates the effects elementary school students experience from having been taught by a NBPTS-certified teacher.

Teachers earn NBPTS certification upon completion of a one- to five-year assessment process. The assessment process requires applicants to complete one general skills exam and three portfolios demonstrating their teaching ability and content knowledge. Washington State provides an annual salary bonus to NBPTS-certified teachers. Some NBPTS-certified teachers working in qualifying high-poverty schools can also receive an additional annual bonus.

## Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
School attendance	4	20605	0.045	0.021	10	0.045	0.030
Suspensions/expulsions	4	20605	0.001	0.001	10	0.001	0.487
Test scores	17	405356	0.021	0.005	10	0.021	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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# National Board for Professional Teaching Standards (NBPTS) certified teachers (for secondary school students)

## Pre-K to 12 Education

Literature review updated March 2018.

**Program Description:** The National Board for Professional Teaching Standards (NBPTS) certification is an advanced teaching credential that complements (and does not replace) state certification. This analysis estimates the effects middle and high school students experience from having been taught by a NBPTS-certified teacher in a math or English Language Arts course.

Teachers earn NBPTS certification upon completion of a one- to five-year assessment process. The assessment process requires applicants to complete one general skills exam and three portfolios demonstrating their teaching ability and content knowledge. Washington State provides an annual salary bonus to NBPTS-certified teachers. Some NBPTS-certified teachers working in qualifying high-poverty schools can also receive an additional annual bonus.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	10	284612	0.031	0.006	13	0.031	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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# Teacher in-subject graduate degrees

## Pre-K to 12 Education

Literature review updated April 2012.

Program Description: This analysis examines the impact of having a teacher with a graduate degree in the subject that they teach (e.g., a math teacher with a graduate degree in mathematics), versus having a teacher without a graduate degree, holding all other measured school, teacher, and student characteristics equal.

Meta-Analysis of Program Effects							
Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	7	58621	0.028	0.011	11	0.028	0.013

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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# Teacher graduate degrees Pre-K to 12 Education

Literature review updated April 2012.

Program Description: This analysis examines the impact of having a teacher with a graduate degree, versus having a teacher without a graduate degree, holding all other measured school, teacher, and student characteristics equal.

Meta-Analysis of Program Effects							
Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	31	5242072	0.000	0.002	11	0.000	0.931

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- Leak, J.A., & Farkas, G. (2011). *Effects of teacher credentials, coursework, and certification on student achievement in math and reading in kindergarten: An ECLS-K study*. Evanston, IL: Society for Research on Educational Effectiveness.
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# Model early childhood education programs

## Pre-K to 12 Education

Literature review updated December 2013.

**Program Description:** This analysis focuses on pre-kindergarten programs developed and administered by researchers primarily in the 1960s and 1970s, including demonstration and pilot programs such as Abecedarian and Perry Preschool. The curriculum and philosophy of these programs varied widely and programs ranged in length from one to five years.

### Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
				ES	SE	Age	ES	p-value
Crime	Primary	2	110	-0.322	0.214	29	-0.322	0.132
High school graduation	Primary	3	203	0.314	0.265	18	0.314	0.237
K-12 grade repetition	Primary	3	192	-0.463	0.253	17	-0.463	0.067
K-12 special education	Primary	3	204	-0.470	0.263	17	-0.470	0.074
Teen births under age 18	Primary	2	109	-0.441	0.395	17	-0.441	0.265
Test scores	Primary	2	309	0.568	0.123	4	0.568	0.001
Teen births (second generation)	Secondary	2	109	-0.441	0.395	17	-0.441	0.265

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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# Transition programs for incoming kindergarteners

## Pre-K to 12 Education

Literature review updated March 2018.

Program Description: Transition programs for incoming kindergarteners provide support to at-risk students and their caregivers in order to enhance school readiness, improve academic and social skills, and increase caregiver involvement in school. In the program included in this analysis (Kids in Transition to School [KITS]), students attend 24 structured group sessions over two months in the summer prior to kindergarten entry and two months in the fall after school begins. The sessions focus on early literacy, prosocial skills, and self-regulation. In addition, caregivers attend 12 workshops with a focus on parenting skills, behavior management, and strategies to help their student develop literacy skills and consistent academic routines.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Externalizing behavior symptoms	1	102	-0.094	0.282	6	-0.218	0.440
Test scores	1	102	0.052	0.215	5	0.122	0.570

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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# Teacher experience

## Pre-K to 12 Education

Literature review updated April 2012.

Program Description: We performed an analysis of how student test scores improved as their teacher's years of experience increased—more experienced teachers are compared with beginning teachers. This estimate represents the average annual gain in the first five years of teaching.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	53	14393842	0.058	0.005	11	0.058	0.001

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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# Charter schools: non-urban charter schools

## Pre-K to 12 Education

Literature review updated August 2013.

Program Description: While charter schools traditionally operate in urban areas, there is a growing body of literature that examines the impact of attending charters located outside of central cities. This analysis include only studies that measure the impact of attending charter schools located outside of urban areas, including suburban and rural schools. The evidence suggests that charter schools located outside of urban areas have no consistent impact on student test scores compared to traditional public schools. We present the findings for reading scores here.

### Meta-Analysis of Program Effects

Outcomes measured	No. of effect sizes	Treatment N	Adjusted effect size and standard error			Unadjusted effect size (random effects model)	
			ES	SE	Age	ES	p-value
Test scores	5	21015	0.011	0.028	11	0.011	0.695

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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