EDUCATION

Does higher spending lead to better educational outcomes?

By Luke Hill
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MOUNTAIN STATES
POLICY CENTER

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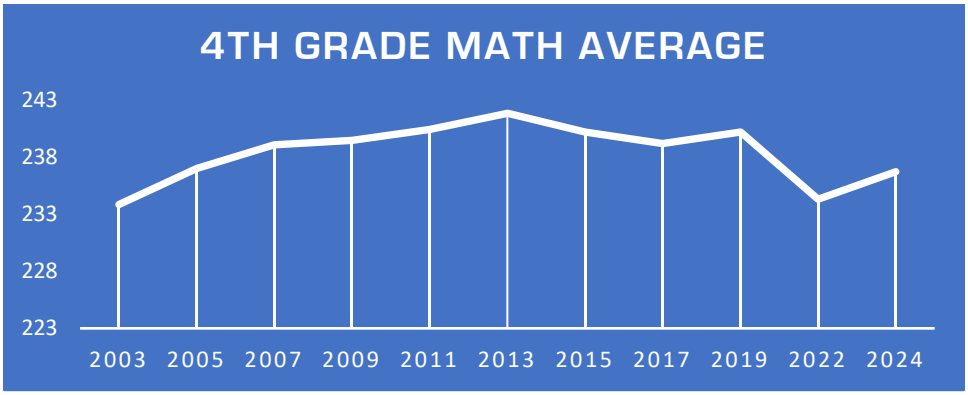
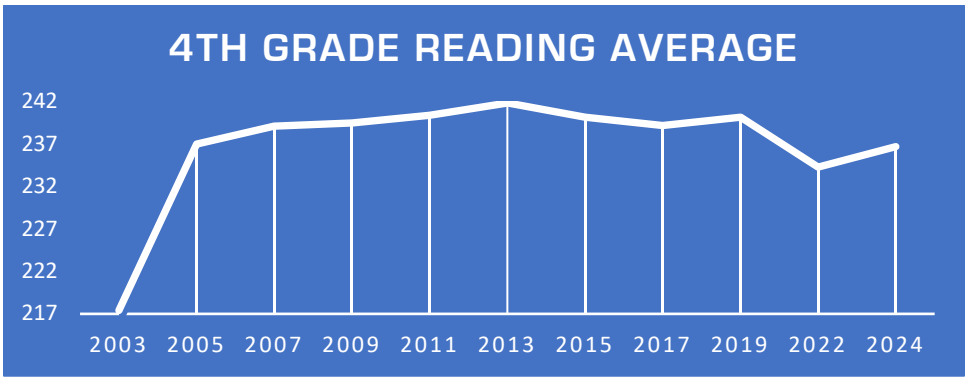
INTRODUCTION

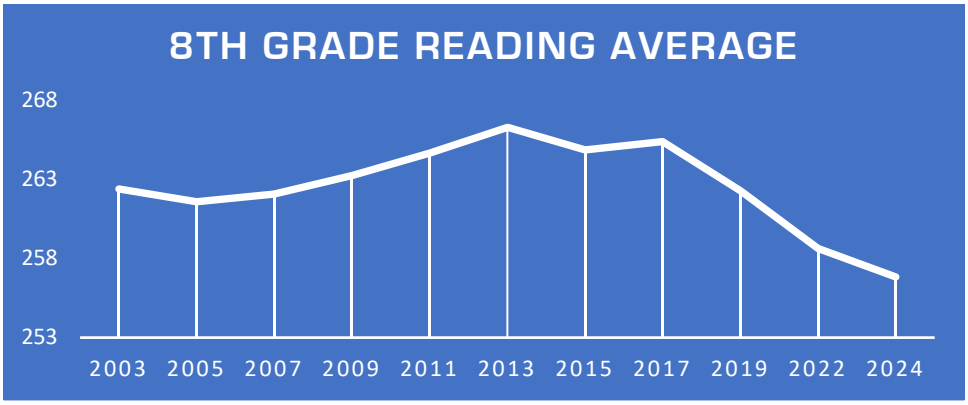
The American education system is at a crossroads. The rise of AI, student apathy, the literacy crisis and recovery from the global COVID-19 pandemic and lockdowns are looming over the education system. Indeed, COVID-19 represented a significant fall in student outcomes when comparing pre- and post- COVID testing data from the National Assessment of Educational Progress (NAEP). As the graphs below show, 4th and 8th grade math and reading scores fell significantly after COVID and have yet to recover fully.

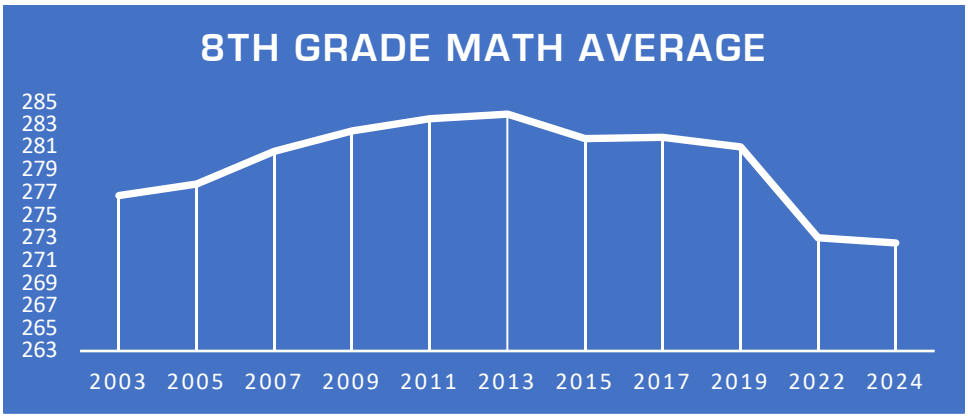
American education is important. Labor is not some homogenous unit that possesses no intelligible differences between its members. Just as low quality steel will lead to a lower quality chassis of a car, poorly educated American workers will lead to a drop in quality of their respective vocations. At this stage of specialization in the American economy, it is more important than ever to improve American education. By drawing on data from the past several years of education spending and outcomes, this paper will seek to answer if higher spending leads to better student outcomes.

Idaho, Washington, Wyoming, and Montana all base their school district expenditure primarily on enrollment.







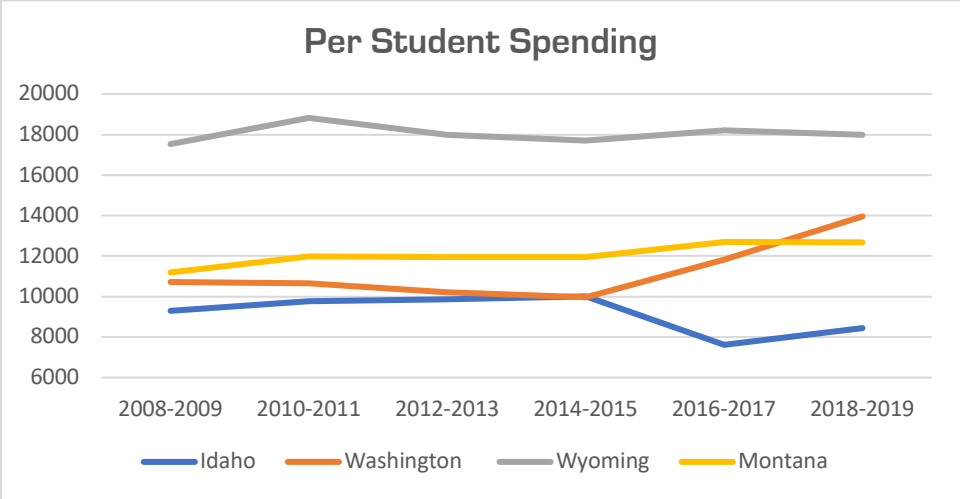


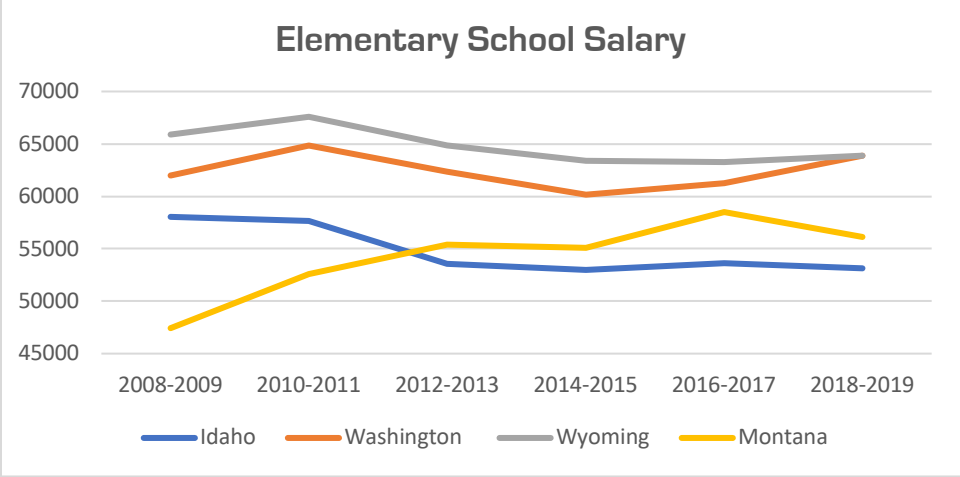
Four State Comparison

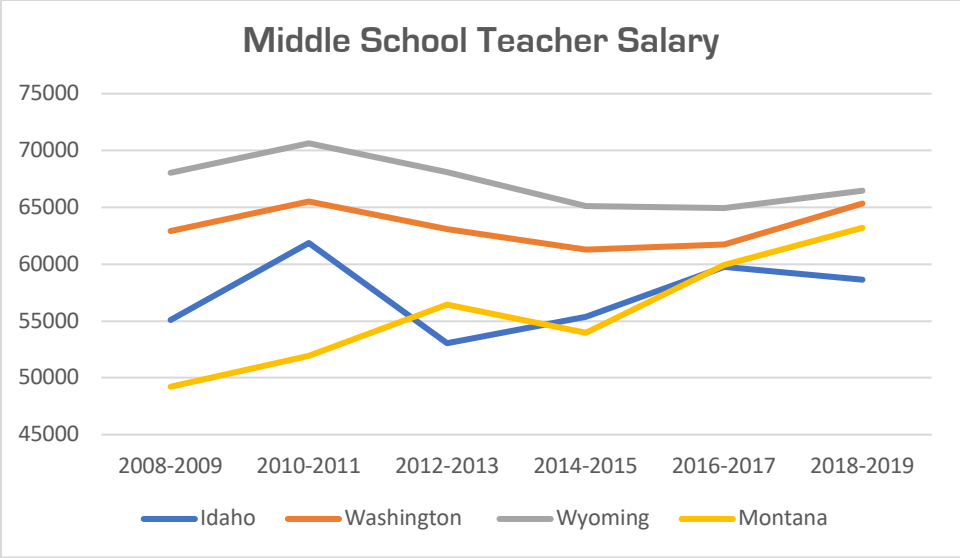
Before looking at a larger data set, it is worth scoping this discussion to the Mountain State region of Idaho, Montana, Washington, and Wyoming. A ten-year analysis from the 2008-2009 school year to the 2018-2019 school year reveals very interesting points about education spending and outcomes.

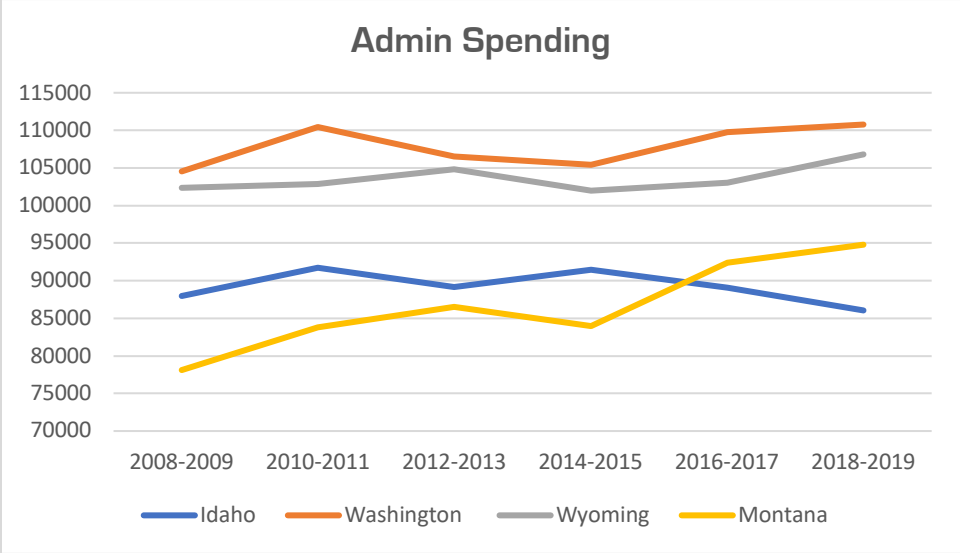
The outcome data used comes from the NAEP, a standardized test that gives a representative sampling of all students in a state's population. The outcomes given are compared against per student spending, teacher salaries at the respective grade level, and school administrators' salaries. Reviewing this data will help answer whether greater levels of spending will produce better results. It is important to note at the outset that no state bases its primary K-12 funding on student outcomes.

Idaho, Washington, Wyoming, and Montana all base school district expenditure primarily on enrollment.







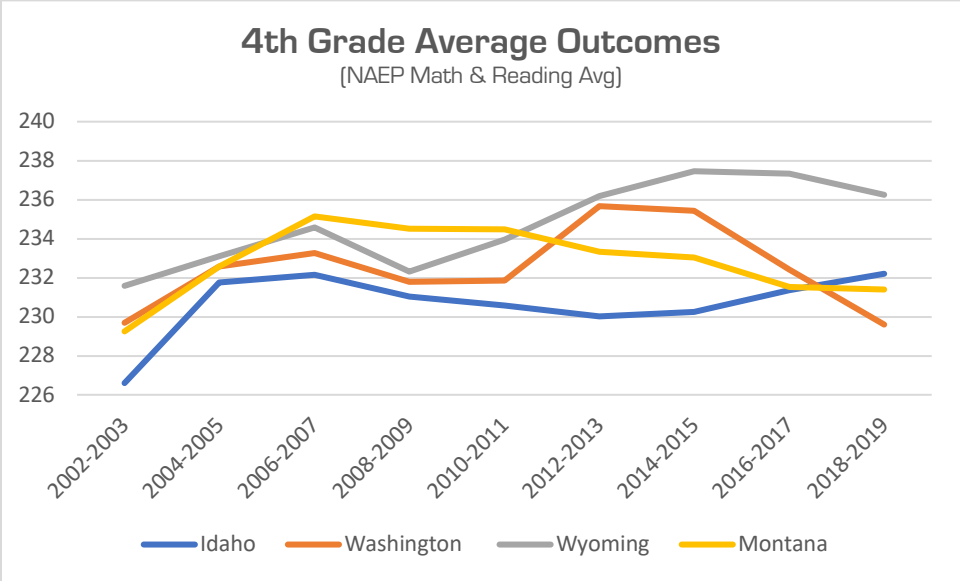


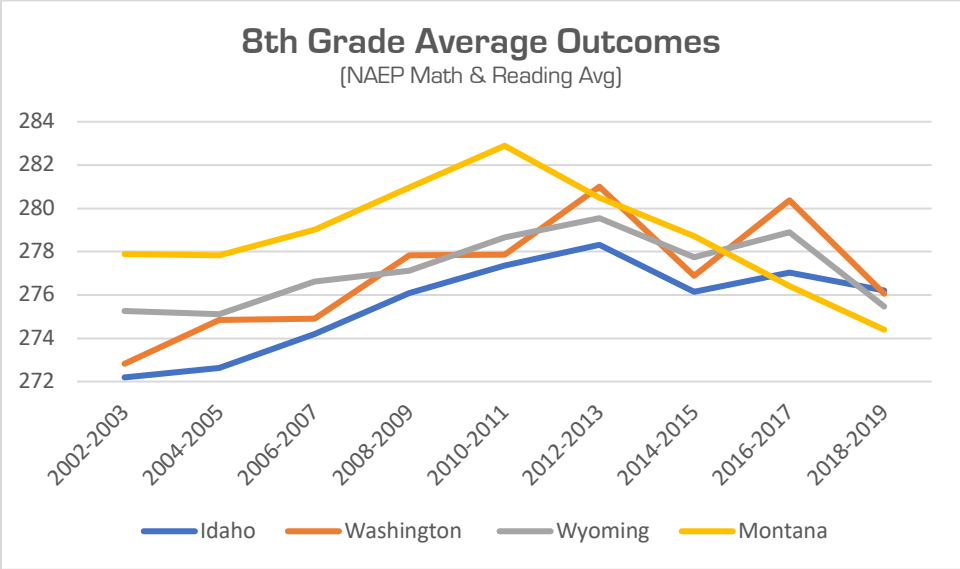
First, notice that Wyoming spends significantly more per student than any other state. This is in part because Wyoming receives high levels of school funding from taxes on natural resource extraction. What is curious is that though Wyoming has always had significantly higher per student spending and salaries for staff, its performance remained close to the other states mentioned above.

Second, note that Washington is the highest spender on administration, and has been since 2008. Finally, note how Idaho and Washington had similar per student spending since 2008, but suddenly diverged after 2015. This is because of the court case McCleary vs State of Washington, in which the Supreme Court of Washington ruled that Washington had underfunded its school districts. In 2014, the Court held Washington in contempt, and in

2015 imposed a $100,000 penalty for each day that Washington did not comply with its ruling.[1]

Now, compare this spending to the 4th and 8th grade outcomes measured by the NAEP.





Clearly, the outcomes shown here are not strictly dependent on spending changes. While Idaho's per student spending declined as Washington's rose, outcomes were essentially equal by the 2018-2019 school year.

[1] "Supreme Court Order No. 84362-7," Washington Supreme Court, August 13th, 2025, available at https://www.courts.wa.gov/content/publicUpload/Supreme%20Court%20News/843627_081315McClearyorder.pdf

Washington's actual outcomes were even rising prior to the McCleary ruling. Wyoming, in spite of being a massive spender relative to the other states, has not outperformed 8th graders in Idaho or Washington, and marginally beats out Montana, but only recently. This intra-state comparison reveals that there is more to the story than simply spending.

Measuring Outcomes

In order to perform any analysis of what factors produce "successful" student outcomes, there must be a standardized means of measuring student outcomes.

Of course, standardized testing is not a perfect measure of student outcomes. No test can possibly capture the holistic human person. However, it certainly can reflect general academic knowledge across several states in a comparable way.

While Idaho's per student spending declined as Washington's rose, outcomes were essentially equal by the 2018-2019 school year.

Therefore, to measure student outcomes, this paper will rely on data from the National Assessment of Educational Progress (NAEP). NAEP tests at the national level are performed on a number of different subjects, but tests at the state level center on mathematics and reading – two fundamental baselines for measuring student performance.

One benefit of the NAEP testing is that it takes effort to take a representative sample of students based on location, performance, and other identity traits which could influence outcomes.[2] This sets it apart from tests like the SAT or ACT, which may select for higher performing students, given the fact that they are optional assessments that lower performing students not planning to go to college may opt out of.

While the NAEP does include private schools in its national assessments, it does not in its state assessments. This will become particularly relevant when trying to draw conclusions from different data markers. Per student spending data is only reflective of public schools, meaning that there is no distorting data with regards to outcome or spending. However, when teacher and administrator salaries are analyzed, it must be kept in mind that the OEWS data drawn from does not delineate between public and private school teachers. This is a limitation of the data set and does reflect a challenge to the veracity of these findings. However, the results of

[2] "Select Participants," National Assessment of Educational Progress, available at https://nces.ed.gov/nationsreportcard/assessment_process/selection.aspx

subsequent analysis will lead to largely intuitive conclusions, and without better data, accounting for the effects would be largely impossible.[3]

Per Student Spending

In a discussion of spending in the aggregate, the data analysis will focus on the different kinds of spending, including per student spending, teacher salaries, and administrative salaries, and then later offer an interpretation of the data.

Per student expenditures are published by the National Education Association (NEA), the largest labor union in the United States. In order to standardize all the data, two controls must be placed on per student expenditures.

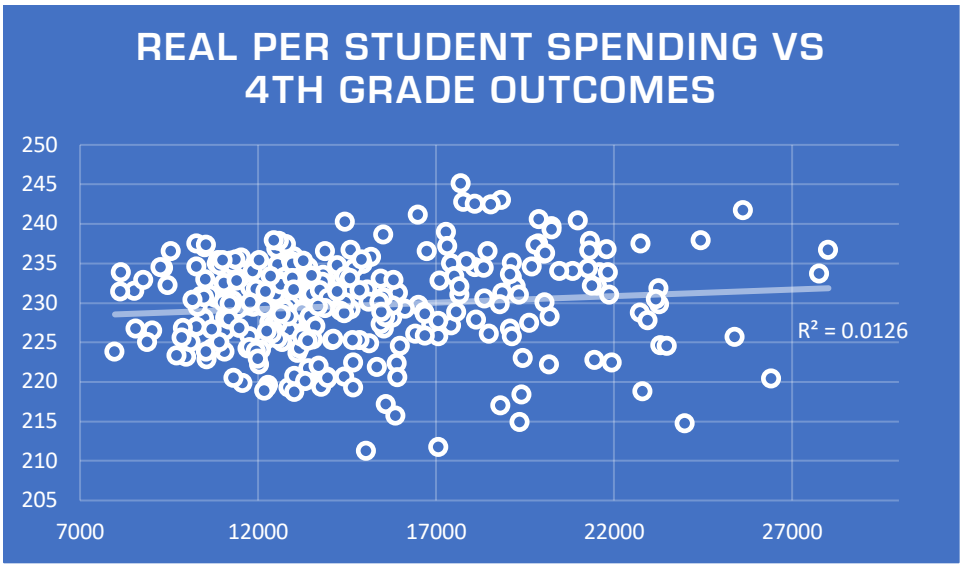
Rhode Island, New York, and Alaska all allocate higher amounts on teacher salaries, but see mediocre or poor results.

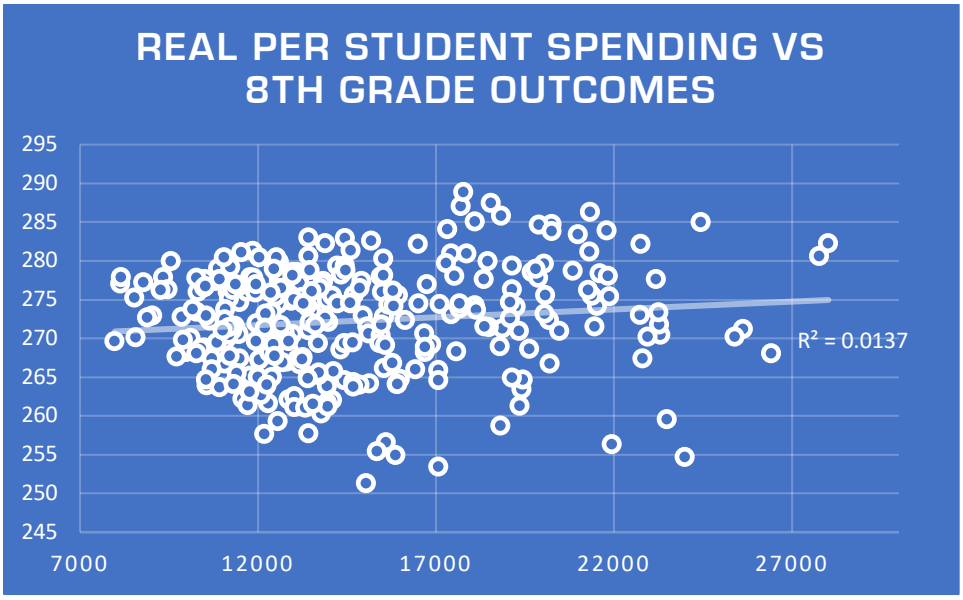
First, Regional Price Parity (RPP) allows for controls between the states. For instance, the overall cost of living for Mississippi is significantly lower than California, meaning that an accurate comparison of salaries and other expenditures for schools will need to be accounted for in order to discern the real difference between the two states.

Second, all data is weighted to 2022 national-level Personal Consumption Expenditure (PCE) values. Like the Consumer Price Index (CPI), PCE allows for controlling for inflation between years, but is now the preferred method for economists due to its ability to control for substitution effects. PCE data is drawn from the St. Louis Federal Reserve,[4] and RPP data is drawn from the Bureau of Economic Analysis (BEA), a government agency of the U.S. Department of Commerce.[5]

With this background in place, the regression analysis shows that real per student spending is a statistically significant predictor of 4th (p = 0.0498173) and 8th (p = 0.0404835) grade outcomes.[6]

[3] NCES data does exist for public school teachers, but does not delineate between elementary, middle, and high school teachers, which can matter when the difference between both inter and intra state salaries are both a few thousand dollars.
[4] "Personal Consumption Expenditures: Chain-type Price Index," Federal Reserve Bank of St. Louis, available at https://fred.stlouisfed.org/series/PCEPI.
[5] "Regional Price Parities by State and Metro Area," Bureau of Economic Analysis, December 12th, 2024, available at https://www.bea.gov/data/prices-inflation/regional-price-parities-state-and-metro-area.
[6] Typically, a p-value of <= 0.05 is the minimum to identify a connection between two variables as "statistically significant."





High spending states such as Vermont and Massachusetts have some higher outcomes, but this is not a universal rule. New York, for example, is a very high spender but hasn't always seen positive outcomes. In fact, it was in the bottom quarter of states in 2022.

To make this data more palatable, below is a breakdown of the top five highest spenders, the lowest five spenders, the five highest outcomes, and the five lowest outcomes.[7]

As shown in the table, high spenders like Vermont and Massachusetts have experienced high outcomes, but this is not a universal rule. New York, as shown, spends large sums but hasn't always seen positive outcomes. In fact, the Empire State was in the bottom quarter of states in 2022.

On the flip side, low spenders can have positive outcomes. Idaho and Utah have below average spending but are consistently on the upper end of state

[7] Of 306 data points.

outcomes. Low performing areas like New Mexico, West Virginia, and D.C. all have high spending levels but limited results.

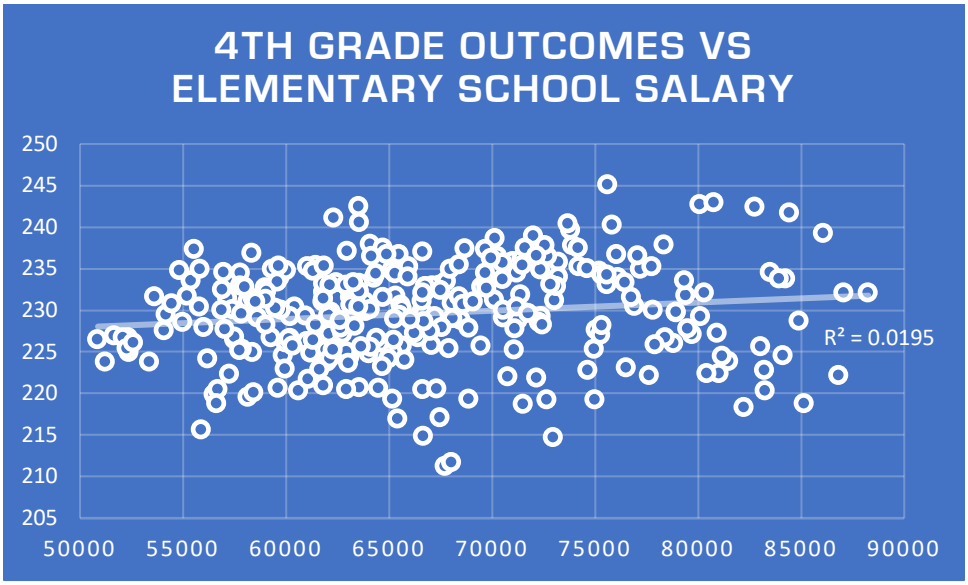
In the end, the lower end of spending has more concentration towards the trendline, but as spending increases, variability does as well.

After Idaho's per-student spending fell from 2015 to 2016, it saw increases in both 4th and 8th grade outcomes.

Top 5 Per Student Spenders	Top 5 Elementary School Outcomes	Top 5 Middle School Outcomes
#1 – 2015 Vermont Ranked 17th by Composite Outcome[8]	#1 – 2011 Massachusetts Ranked 67th by Spending	#1 – 2013 Massachusetts Ranked 66th by Spending
#2 – 2017 Vermont Ranked 43rd by Composite Outcome	#2 – 2015 Massachusetts Ranked 54th by Spending	#2 – 2017 Massachusetts Ranked 57th by Spending
#3 – 2022 New York Ranked 263rd by Composite Outcome	#3 – 2013 Massachusetts Ranked 66th by Spending	#3 – 2011 Massachusetts Ranked 67th by Spending
#4 – 2019 New York Ranked 55th by Composite Outcome	#4 – 2013 New Hampshire Ranked 64th by Spending	#4 – 2013 New Jersey Ranked 25th by Spending
#5 – 2022 Vermont Ranked 217th by Composite Outcome	#5 – 2017 Massachusetts Ranked 57th by Spending	#5 – 2015 Massachusetts Ranked 54th by Spending
Bottom 5 Per Student Spenders Salaries[9]	Bottom 5 Elementary School Outcomes	Bottom 5 Middle School Outcomes
#5 – 2013 Arizona Ranked 207th by Outcome	#5 – 2022 West Virginia Ranked 93rd by Spending	#5 – 2015 DC Ranked 109th by Spending
#4 – 2011 Utah Ranked 120th by Composite Outcome	#4 – 2022 Alaska Ranked 45th by Spending	#4 – 2022 West Virginia Ranked 93rd by Spending
#3 – 2017 Utah Ranked 69th by Composite Outcome	#3 – 2022 DC Ranked 7th by Spending	#3 – 2022 DC Ranked 7th by Spending
#2 – 2017 Idaho Ranked 99th by Composite Outcome	#2 – 2022 New Mexico Ranked 79th by Spending	#2 – 2022 New Mexico Ranked 79th by Spending
#1 – 2011 Arizona Ranked 235th by Composite Outcome	#1 – 2011 DC Ranked 114th by Spending	#1 – 2011 DC Ranked 114th by Spending

Next, an analysis of teachers' salaries versus outcomes. After controlling for the same inflation and regional differences with per student spending, regression analysis found a statistically significant connection between elementary school teachers' real salaries and 4th grade outcomes (p = 0.01486835), and middle school teachers' real salaries and 8th grade outcomes (p = 0.0000104502433591659).

[8] Composite Outcome refers to an average between 4th and 8th grade outcomes.
[9] #1 refers to the lowest spender and lowest outcome when discussing bottom 5 spenders and outcomes.



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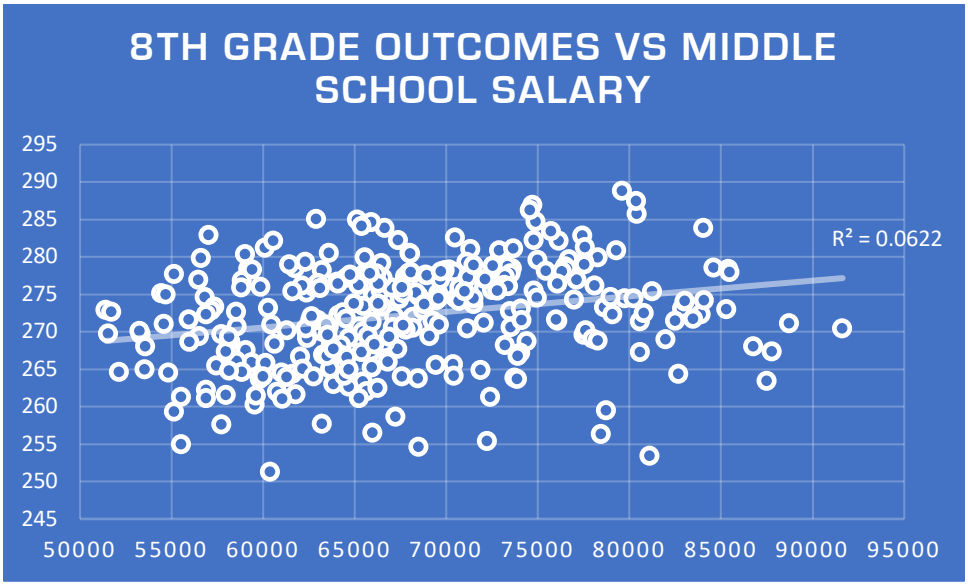


Below is another breakdown of the top five and bottom five for salaries and outcomes. Here, there is more of a mixed bag than with per student spending. Rhode Island, New York, and Alaska all spend more on teacher salaries, but see mediocre or poor results. High performing middle school states like Massachusetts and New Jersey do have high teacher salaries, however.

At the bottom of teacher salary spending, states including Oklahoma, Arizona, and Mississippi all spend very little on teacher salaries and get poor results.

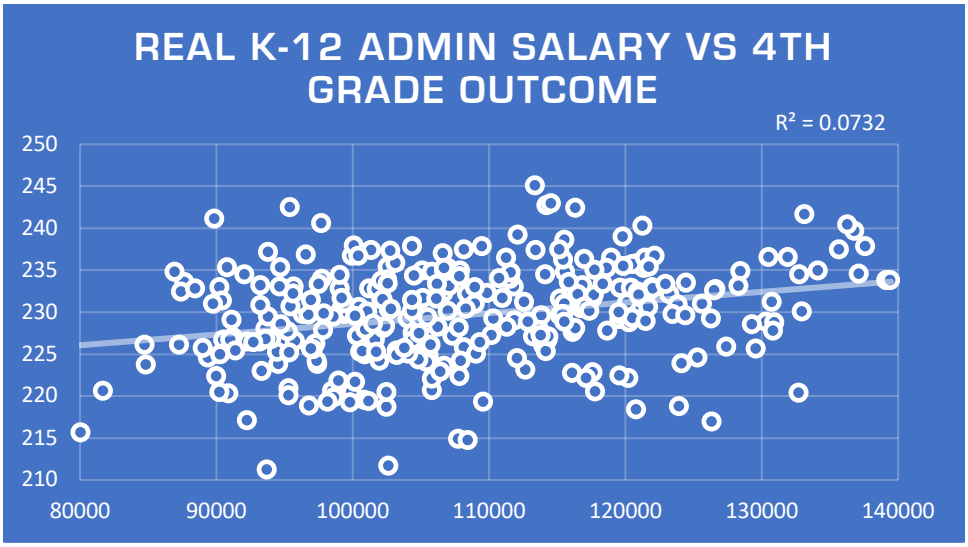
Improving student outcomes is possible without blindly increasing spending.

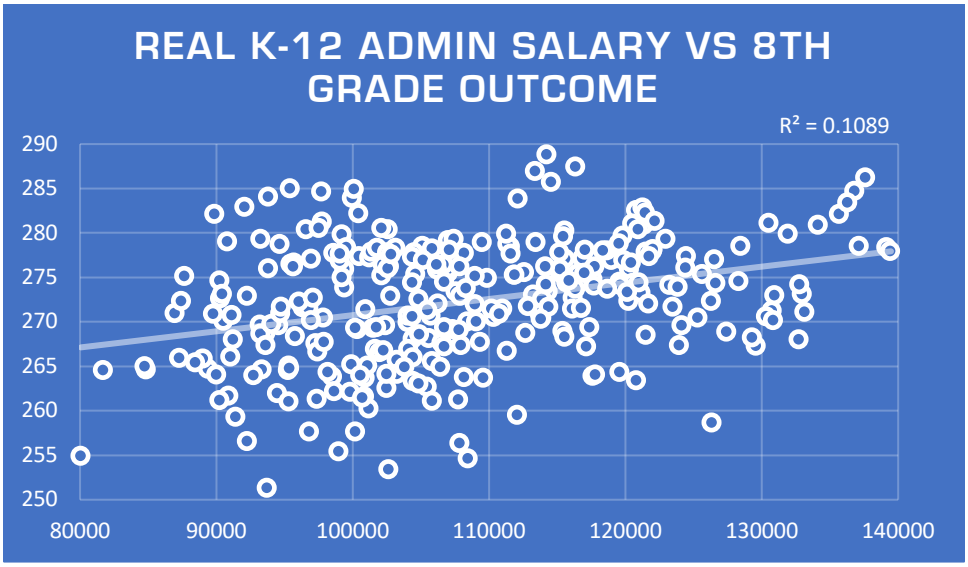
Top 5 Elementary School Teacher Salaries	Top 5 Elementary School Outcomes	Top 5 Middle School Teacher Salaries	Top 5 Middle School Outcomes
#1 – 2011 Rhode Island Ranked 112th by Outcome	#1 – 2011 Massachusetts Ranked 48th by Spending	#1 – 2015 Alaska Ranked 194th by Outcome	#1 – 2013 Massachusetts Ranked 29th by Spending
#2 – 2013 Rhode Island Ranked 109th by Outcome	#2 – 2015 Massachusetts Ranked 21st by Spending	#2 – 2019 New York Ranked 180th by Outcome	#2 – 2017 Massachusetts Ranked 26th by Spending
#3 – 2011 Alaska Ranked 272nd by Outcome	#3 – 2013 Massachusetts Ranked 25th by Spending	#3 – 2017 Alaska Ranked 233rd by Outcome	#3 – 2011 Massachusetts Ranked 63rd by Spending
#4 – 2019 Massachusetts Ranked 151st by Outcome	#4 – 2013 New Hampshire Ranked 188th by Spending	#4 – 2019 Alaska Ranked 277th by Outcome	#4 – 2013 New Jersey Ranked 64th by Spending
#5 – 2017 Alaska Ranked 295th by Outcome	#5 – 2017 Massachusetts Ranked 15th by Spending	#5 – 2022 New York Ranked 227th by Outcome	#5 – 2015 Massachusetts Ranked 25th by Spending
Bottom 5 Elementary School Teacher Salaries	Bottom 5 Elementary School Outcomes	Bottom 5 Middle School Teacher Salaries	Bottom 5 Middle School Outcomes
#5 – 2022 Mississippi Ranked 236th by Outcome	#5 – 2022 West Virginia Ranked 150th by Salary	#5 – 2013 Arizona Ranked 198th by Outcome	#5 – 2015 DC Ranked 90th by Salary
#4 – 2019 Arizona Ranked 210th by Outcome	#4 – 2022 Alaska Ranked 140th by Salary	#4 – 2022 Arizona Ranked 261st by Outcome	#4 – 2022 West Virginia Ranked 178th by Salary
#3 – 2017 Oklahoma Ranked 208th by Outcome	#3 – 2022 DC Ranked 69th by Salary	#3 – 2017 Arkansas Ranked 156th by Outcome	#3 – 2022 DC Ranked 7th by Salary
#2 – 2022 Arizona Ranked 261st by Outcome	#2 – 2022 New Mexico Ranked 121st by Salary	#2 – 2019 Arkansas Ranked 202nd by Outcome	#2 – 2022 New Mexico Ranked 128th by Salary
#1 – 2015 Arizona Ranked 218th by Outcome	#1 – 2011 DC Ranked 125th by Salary	#1 – 2015 Arizona Ranked 218th by Outcome	#1 – 2011 DC Ranked 249th by Salary

Finally, a look at administration. Here, the data is slightly more rocky. The Occupational Employment and Wage Statistics (OEWS) report not only does not delineate between private and public school administrators, but it also does not distinguish between elementary, middle, or high school, or between the different kinds of administration roles like vice president,

athletic directors, or superintendents. The description given for the job is "Plan, direct, or coordinate the academic, administrative, or auxiliary activities of kindergarten, elementary, or secondary schools."[10]

The regression analysis returned a statistically significant connection between both 4th and 8th grade outcomes and K-12 administrative salaries (p = 0.0000015479199176971 and p = 0.00000000331232955810259).





Below is the top/bottom five breakdown. States including Vermont, Connecticut, and New Jersey all have high administrator salaries and good testing results, and in general the top performing schools have relatively

[10] "Occupational Employment and Wage Statistics: 11-9032 Education Administrators, Kindergarten through Secondary," U.S. Bureau of Labor Statistics, available at https://www.bls.gov/oes/2023/may/oes119032.htm.

high admin salaries, with the exception of New Hampshire. Further, none of the bottom five performing schools break the top hundred in administrator salary.

Top 5 Administrative Salaries	Top 5 Elementary School Outcomes	Top 5 Middle School Outcomes
#1 – 2019 Vermont Ranked 66th by Composite Outcome	#1 – 2011 Massachusetts Ranked 109th by Administrator Salary	#1 – 2013 Massachusetts Ranked 100th by Administrator Salary
#2 – 2017 Connecticut Ranked 62nd by Composite Outcome	#2 – 2015 Massachusetts Ranked 97th by Administrator Salary	#2 – 2017 Massachusetts Ranked 82nd by Administrator Salary
#3 – 2013 New Jersey Ranked 8th by Composite Outcome	#3 – 2013 Massachusetts Ranked 100th by Administrator Salary	#3 – 2011 Massachusetts Ranked 97th by Administrator Salary
#4 – 2015 Connecticut Ranked 51st by Composite Outcome	#4 – 2013 New Hampshire Ranked 258th by Administrator Salary	#4 – 2013 New Jersey Ranked 3rd by Administrator Salary
#5 – 2011 New Jersey Ranked 7th by Composite Outcome	#5 – 2017 Massachusetts Ranked 82nd by Administrator Salary	#5 – 2015 Massachusetts Ranked 97th by Administrator Salary
Bottom 5 Administrative Salaries	Bottom 5 Elementary School Outcomes	Bottom 5 Middle School Outcomes
#5 – 2015 North Carolina Ranked 133rd by Outcome	#5 – 2022 West Virginia Ranked 306th by Administrator Salary	#5 – 2015 DC Ranked 233rd by Administrator Salary
#4 – 2022 Arizona Ranked 262nd by Composite Outcome	#4 – 2022 Alaska Ranked 144th by Administrator Salary	#4 – 2022 West Virginia Ranked 306th by Administrator Salary
#3 – 2022 North Carolina Ranked 247th by Composite Outcome	#3 – 2022 DC Ranked 134th by Administrator Salary	#3 – 2022 DC Ranked 134th by Administrator Salary
#2 – 2019 Louisiana Ranked 278th by Composite Outcome	#2 – 2022 New Mexico Ranked 192nd by Administrator Salary	#2 – 2022 New Mexico Ranked 192nd by Administrator Salary
#1 – 2022 West Virginia Ranked 303rd by Outcome	#1 – 2011 DC Ranked 271st by Administrator Salary	#1 – 2011 DC Ranked 271st by Administrator Salary

Analysis of the Data

Based on the regression analysis of the data, higher spending, at least as it pertains to the categories given above, is correlated with higher outcomes. But does that mean that there is a causal connection between spending and outcomes? Can a state simply increase its budget and produce better students?

One of the most important factors, if not the most important factor, to student success is teacher quality.

That does not seem to bear out in the case study between Montana, Wyoming, Washington, and Idaho. After Idaho's per-student spending fell from 2015 to 2016, it saw increases in both 4th and 8th grade outcomes, while Washington's large per-student spending increase was followed by a fall in 4th grade outcomes (though 8th grade outcomes did rise).

One of the most important factors, if not the most important factor, to student success is teacher quality. Research from Eric Hanushek and others finds that "[t]eachers and therefore schools matter importantly for student achievement." Their research goes on to state that "[s]imilar to most past research, we find absolutely no evidence that having a master's degree improves teacher skills" and "[t]here appear to be important gains in teaching quality in the first year of experience and smaller gains over the next few career years. However, there is little evidence that improvements continue after the first three years."[11]

What are teacher salaries based on in most states? School districts often use what is referred to as a steps and lanes system, which provides pay increases for each year of experience ("steps"), and higher base pay for education increases ("lanes").[12] Under this system, a teacher with a bachelor's degree who has been teaching for 10 years will make more than a teacher with a bachelor's who has been teaching for 5, but if the latter teacher got a master's degree, he may increase his pay more than the former. But this pay system does not reward better quality teaching, as was just shown. This problem is compounded by the fact that it is nearly impossible to fire a low-quality public school teacher. The process, if it is not blocked by teacher tenure, can take two to five years in a lengthy and costly legal process.[13] Depending on the location, it becomes nearly impossible to fire anyone.

What can be done about this predicament? Improving student outcomes is possible without blindly increasing spending. It is time to turn to a final case study from New Orleans to illustrate this point.

Lessons From New Orleans

After Hurricane Katrina hit New Orleans in 2005, the school system was so devastated that it overturned the entire education system. Almost every

[11] "Teachers, Schools, and Academic Achievement," Econometrica, March 2005, available at https://www.jstor.org/stable/pdf/3598793.pdf?refreqid=fastly-default%3Abd45455517f0a337c24efb479bf3b1a1&ab_segments=&initiator=&acceptTC=1 page 449.
[12] "Teachers Pay, Explained: Salary, Benefits, and Pensions," EdWeek, April 17, 2025, available at https://www.edweek.org/teaching-learning/teacher-pay-explained-salary-benefits-and-pensions/2025/04
[13] "Study: It's Far Too Hard to Fire Bad Teachers," EdWeek, December 8th, 2016, available at https://www.edweek.org/teaching-learning/study-its-far-too-hard-to-fire-bad-teachers/2016/12.

Reforms adopted in New Orleans after the Hurricane Katrina disaster worked – allowing for significant increases in student achievement, graduation rates, college entry rates, college persistence rates, and college graduation rates.

school was converted to a non-profit, privately run charter school with complete pay, hiring, and firing autonomy.[14]

According to the research, this reorganization worked. The reforms were followed by significant increases in student achievement, graduation rates, college entry rates, college persistence rates, and college graduation rates.[15] Keep in mind, this was following the economic disaster that was Hurricane Katrina, and it happened in the district ranked 67th out of 68th in math and reading test scores among Louisiana school districts. It happened in a district with a previous graduation rate 10% lower than the state average.[16] The lesson here is that improvements in teacher and school quality come from more than just funding increases, and that a fundamental part of a child's education quality is their teacher.

Conclusion

While there appears to be a correlation between education expenditures and student outcomes, it is not clear that this implies a causal relationship between funding and outcomes. Research on teacher quality, comparing the spending and outcomes in our region, and case studies from New Orleans give compelling evidence that academic performance can be improved by giving schools greater autonomy over who they hire and fire. It is also clear from the research that teacher quality is not improved merely by increases in teacher education levels or a one-size-fits-all salary model that doesn't focus on rewarding excellence. Yet this continues to be the dominant formula that determines how teacher pay is determined.

Policy makers should make decisions centered around improving school autonomy to manage their staff and reward high-performing teachers rather than flooding the system with greater funds if student performance is waning.

[14] "Charter School City: What the End of Traditional Public Schools in New Orleans Means for American Education," Douglas N. Harris, July 15th, 2020, available at https://www.google.com/books/edition/Charter_School_City/wbjtDwAAQBAJ?hl=en&gbpv=1&pg=PA3&printsec=frontcover Page 11.

[15] "What Effect Did the New Orleans School Reforms Have on Student Achievement, High School Graduation, and College Outcomes," Education Research Alliance for New Orleans, July 15th, 2018, available at https://educationresearchalliancenola.org/files/publications/071518-Harris-Larsen-What-Effect-Did-the-New-Orleans-School-Reforms-Have-on-Student-Achievement-High-School-Graduation-and-College-Outcomes.pdf Page 1.

[16] IBID. Page 2.

SUMMARY & KEY FACTS

This study analyzes whether increased education spending leads to improved student outcomes, using NAEP testing data and adjusted spending figures across the Mountain States and nationally. While higher per-student, teacher, and administrative spending can correlate with better test scores, the relationship is inconsistent—many high-spending states perform only average, and some low-spending states achieve strong results. The findings suggest that school autonomy and teacher quality—not merely funding levels—are the key drivers of educational success.

1. Wyoming consistently spends far more per student than neighboring states but achieves similar NAEP outcomes.
2. Regression analysis found statistically significant links between spending and test scores, yet causation remains unproven.
3. High teacher and administrator salaries correlate with higher outcomes, but exceptions (e.g., Alaska, New York) show the limits of pay alone.
4. Most districts base pay on “steps and lanes,” rewarding tenure and degrees rather than teaching effectiveness.
5. After Hurricane Katrina, New Orleans’ charter-based school reforms produced substantial gains in achievement, graduation, and college success.

ABOUT THE AUTHOR

Luke Hill was a policy intern for Mountain States Policy Center in 2025. A long time Idahoan, he is an undergraduate at Hillsdale College in Michigan studying economics with a minor in Math.

He hopes to pursue an academic career in economics after he graduates.

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