



ARIZONA STATE UNIVERSITY

Arizona's Education Financing

Elementary and Secondary Education: 2002-2011

By Dan Hunting
Senior Policy Analyst
Morrison Institute for Public Policy

Presented Nov. 19, 2013 at



CONFERENCE

Arizona's Education Financing

Elementary and Secondary Education: 2002-2011

Education financing in the U.S. is a complicated affair, with funding coming from local, state and federal revenue. Comparisons between the states can be difficult because of differences in accounting for this revenue, but by almost any measure Arizona ranks near the bottom for funding of education. Arizona has grown rapidly over the years and our education system has grown in step with the population. But increasing the total budget for education doesn't mean that we have directed more resources to each student.

The numbers show that Arizona has one of the lowest per-pupil funding rates in the country. Parties of one faction or another argue endlessly about which numbers to use in comparing Arizona to other states, or even whether such comparisons are possible. What is indisputable is that Arizona ranks in the bottom tier of states in both education spending and in student achievement and that we have made substantial cuts in our funding of both K-12 and higher education since the beginning of the Great Recession.

Arguing over whether the state ranks 48th or 45th or 42nd in the nation on any of these measures misses the point. The important fact is that we are not serving our children well and we are not positioning our economy to prosper. Continuing disputes about which numbers best describe our educational expenditures do nothing to advance the cause of improving our state. Glossing over the situation by pointing to one narrow demographic that seems to perform near the national average masks the reality that as a whole our students perform poorly. We can set our aspirations much higher and commit to the idea that all Arizona children need and deserve a quality education.

Methodology

Education funding is complex, in part because of the many conflicting data sources used. Even in Arizona it is nearly impossible to identify a definitive number that accurately represents annual education spending. Further, some advocacy groups, when reporting on education financing, compromise their research methods for the sake of advancing their policy position.

In an effort to circumvent these distortions and draw accurate comparisons between Arizona and other states, this paper reports conclusions from a single dataset, the Statistical Tables of Primary and Secondary Education, compiled annually by the United States Census Bureau.

(<http://www.census.gov/govs/school/>) This has the advantage of providing "apples-to-apples" comparison among all 50 states, across time, from a source of known and accepted reliability. Due to the length of time needed to compile the census data, the most recent data are from 2011.

All dollar amounts are inflation-adjusted and expressed in 2011 dollars.

Note: Comparisons in this analysis were made with Arizona and the other 49 states. Although the District of Columbia is included as an entry in the Census data, it was omitted from this analysis. A state-level analysis of education funding would be unnecessarily skewed by inclusion of a region that is not a state and whose funding profile is so radically different from the other entries in the dataset.

Education Funding in FY 2011

What are the sources of Arizona's K-12 education revenue?

In fiscal year (FY) 2011, a total of \$8.4 billion was spent on K-12 education in Arizona. Of this amount, \$1.2 billion (15%) was from federal sources, \$3.1 billion (37%) was state funding, and \$4 billion (48%) was local funding.

State revenue is primarily General Fund revenue generated through Transaction Privilege (sales) tax and personal and corporate income taxes. The primary local revenue source is property tax, but state money is also passed through to local districts through several channels.

How does Arizona's current education funding compare to other states?

In 2011, the national average amount spent was \$12,411 per K-12 pupil. When including all federal, state, and local monies, Arizona spent \$8,806 per K-12 pupil, 29% less than the national average, ranking 47th of the 50 states.

It is also instructive to consider Arizona's education funding in comparison to the size of its overall economy. Arizona spends \$38.49 on K-12 education for every \$1,000 of personal income. The national average is \$48.68, ranking Arizona 49th in the nation.

A third way to gauge the state's financial education support is calculating the ratio of per-pupil expenditure to per-capita personal income. This measure accounts for both the size of the economy and the size of the state's population. Arizona ranks 45th nationally on this measure.

What percent of the total state budget is spent on education, and how does this compare to other states?

As a percentage of the total state, budget, Arizona spends 20% on K-12 education, matching the national average,

Figure 1: State Spending as a Percent of Total State Expenditures

	Arizona	All States
K-12 Education	20.0%	20.2%
Higher Education	13.9%	10.3%
Public Assistance	0.2%	1.7%
Medicaid (AHCCCS)	33.9%	23.7%
Corrections	3.5%	3.1%
Transportation	6.2%	7.4%
All Other	22.3%	33.6%
Total	100.0%	100.0%

Source: State Expenditure Report: Examining FY 2012 State Spending, National Association of State Budget Officers

Is education funding lower here because Arizona is a low-income state?

Common sense dictates that wealthy states can pay more for education than poor ones, and per-pupil spending is highly correlated with per capita personal income. However, Arizona's per capita personal income ranks 42nd among the states, yet 47th in per-pupil spending. By contrast, New Mexico, with a lower per capita personal income than Arizona (ranked 43rd), spends considerably more on education, ranking 34th.

Arizona spends 17% less on education than the national average when adjusted for statewide wealth.¹ If spending were adjusted to the level expected for a state with our per capita personal income, it would raise per-pupil spending from \$8,806 to \$10,332, representing an additional \$330 million expenditure, and moving us from 47th in per-pupil funding to 40th.

Funding Changes 2002-2011

Easily comparable data from the Census Bureau span from FY2002 to FY2011. This time span provides a useful look at historical funding trends, including both the boom and bust years of the 2000s.

NOTE: All 2002 figures have been inflation-adjusted and are expressed in 2011 dollars.

How have total funding and per-pupil funding changed since 2002?

Arizona's total education funding in 2002 was \$7.7 billion², compared with 2011 funding of \$8.4 billion, an 8% absolute increase. However, over the same time period there was a 10% increase in K-12 enrollments in the state, resulting in a net 2% decrease in per-pupil funding. Nationwide, there was a 12% increase in per-pupil funding over that same period, with 47 states increasing their total per-pupil funding. Arizona ranked 48th for per-pupil education funding growth over that period and was one of only three states, including Idaho and Georgia, to register a funding decline.

Federal, state, and local funding components

Education is funded by federal, state, and local monies. But, there has been a significant change in the mix of these funds since 2002, with state funds accounting for a smaller share of total revenue. State funding for education went from 46% of the total in FY2002 to 37% in FY2011. Local funding went from 44% in FY2002 to 48% in FY2011. Federal revenue, which made up about 10% of FY2002 education funding, rose to 15% of the \$8.3 billion the state spent on education in FY2011.

**Figure 2: Changes in Funding Sources:
2002-2011**

	State	Local	Federal
Arizona 2002	46%	44%	10%
Arizona 2011	37%	48%	15%

Decreases in state funding for K-12 education have been partially offset by increases in revenue from local and federal sources. Federal revenue flowing to Arizona's K-12 education increased from \$619,869,000 in FY 2002 to \$1,245,814,000 in FY 2011, a 46% increase when these amounts are

¹ Regression equation: Predicted FY11 Education Expenditure = (0.4331 * Per Capita Personal Income) - 4173.6

² All dollar amounts in this section have been expressed in 2011 dollars. Total Arizona education funding in 2002 dollars was \$6.2 billion.

expressed in 2011 dollars. Although a substantial increase, this is far below the 76% national average increase in federal funding. Had Arizona’s per-pupil funding from federal sources remained flat over this period, the state would have seen a 6% drop in overall funding per pupil instead of the 2% drop actually realized. Arizona ranked 45th for increases in federal education funding between FY 2002 and FY 2011.

Federal education funding comes from both formula-based funding and competitive grants. More study is needed to understand why Arizona’s growth in federal funding is below the national average.

State funding for K-12 education fell by 21% between FY 2002 and FY 2011, the largest decline in the country. This reduction was partially offset by an 8% increase in funding from local sources, the 37th largest increase over the period.

Complex funding formulas may blur the lines between state and local funding sources and it is possible that not all states report state and local revenues in the same way to the Census Bureau. To address this issue, state and local revenue funding sources can be summed to capture both sources and eliminate any distortions.

Between FY 2002 and FY 2011 combined state and local revenue decreased by \$573 per pupil, a 7% drop. Only Georgia and Idaho showed larger decreases in per-pupil state and local revenue over the period, while 37 states showed increases.

Figure 3: Changes in Per-Pupil Revenue: 2002-2011

	State Only	Local Only	State + Local	Federal	Total
Arizona	-21%	8%	-7%	46%	-2%
United States	0%	13%	6%	76%	12%

Other Questions:

How do Arizona students perform on the NAEP test?

In 2013, scores on the National Assessment of Educational Progress showed that performance of 4th-grade math students in Arizona was statistically equal to the national average. The scores on 4th-grade reading, 8th-grade math, and 8th-grade reading tests were below the national average.

Figure 4: 2013 NAEP Tests (50 States)

Test	States with Scores Higher than Arizona	States with Scores Not Significantly Different from Arizona	States with Scores Lower than Arizona	Arizona Score Compared to National Average
4th Grade Math	20	21	8	Same
4th Grade Reading	40	6	3	Below
8th Grade Math	29	13	7	Below
8th Grade Reading	36	10	3	Below

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013

How do sub-groups perform in Arizona?

No sub-group of Arizona students in any grade or testing area exceeded the national average on the 2013 NAEP test.

The National Center for Education Statistics provides NAEP scores for several demographic sub-groups including gender, race/ethnicity, and participation in the National School Lunch Program (NSLP). Students eligible for NSLP represent those from families that earn less than 185% of the federally defined poverty level. Data is also provided on students in the top quartile (75th percentile) and bottom quartile (25th percentile) of test performance.

Figure 5 shows how various demographic sub-groups performed versus similar sub-groups nationwide. Note that it is possible for a state to perform below the national average overall, yet have sub-groups that perform at or above the average.

Figure 5: 2013 NAEP Tests (50 States)

Arizona's Performance – Above, the Same, or Below the National Average

Group	4th Grade Math	4th Grade Reading	8th Grade Math	8th Grade Reading
All Students	Same	Below	Below	Below
Male	Same	Below	Below	Below
Female	Same	Below	Below	Below
White Students	Same	Same	Same	Same
Hispanic Students	Same	Same	Same	Same
Black Students	Same	Same	Same	Same
School Lunch Eligible	Same	Below	Same	Below
Not School Lunch Eligible	Same	Below	Same	Below
75 th Percentile	Same	Below	Below	Below
25 th Percentile	Same	Below	Below	Below

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013

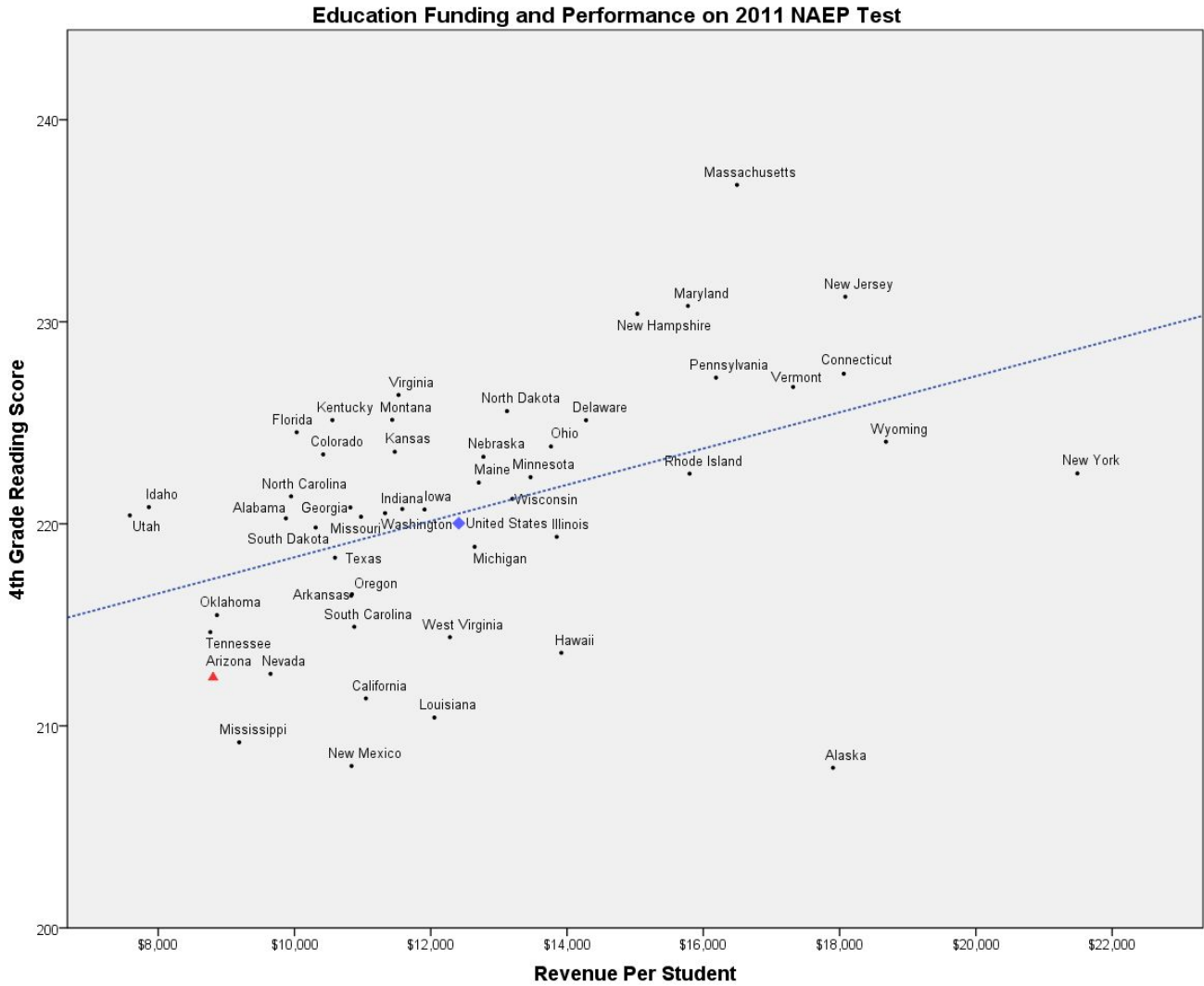
Is funding per pupil positively correlated with student performance?

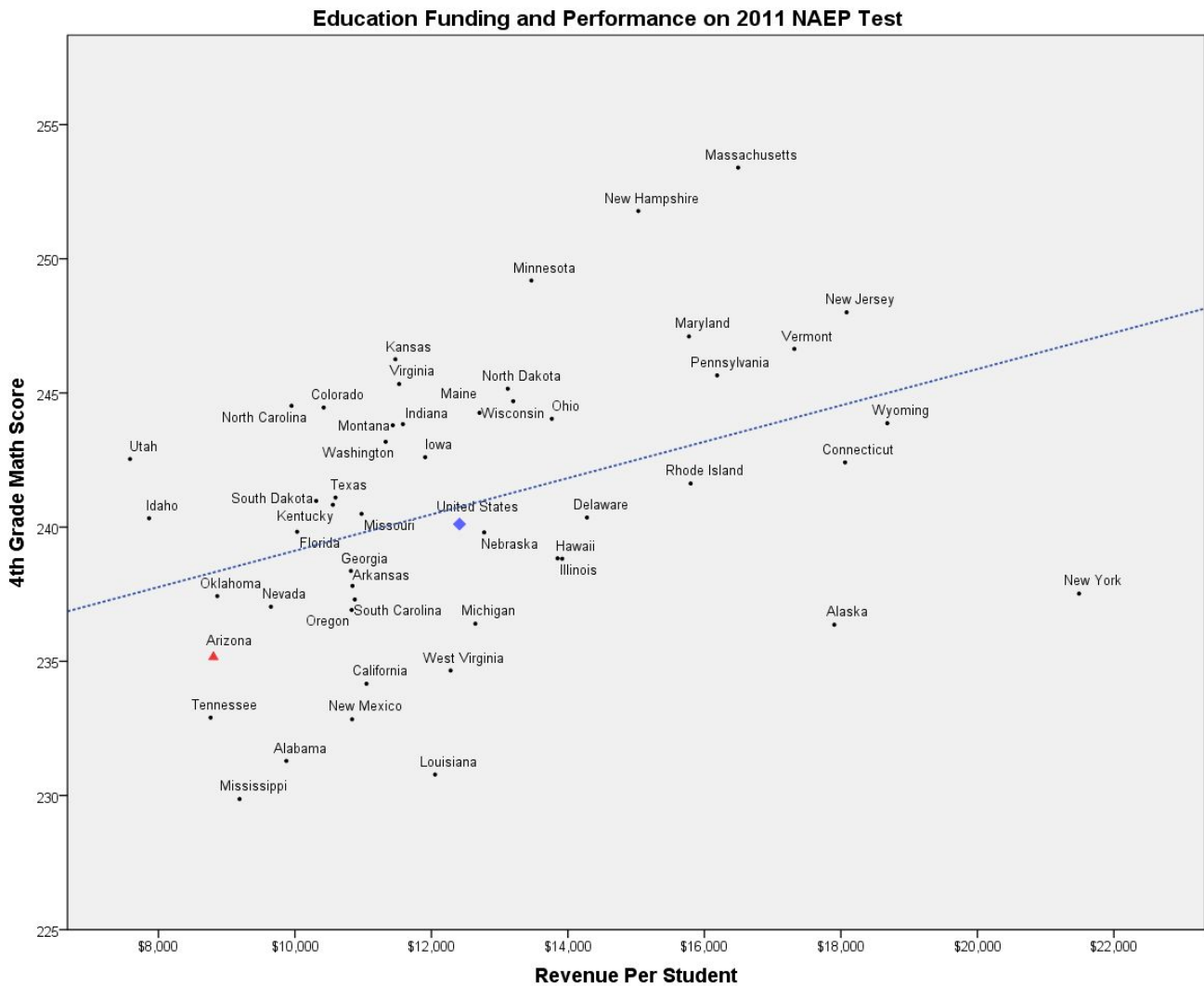
A simple bivariate correlation between per-pupil funding and 2011 NAEP scores indicates a positive connection between test performance in reading and math in 4th and 8th grades and per-pupil funding. The more money invested, the higher the test scores.

Figure 6: Correlations Between Funding Per Pupil and 2011 NAEP Scores (50 States)

Test	Spearman's rho	
4th Grade Math	0.444	**
4th Grade Reading	0.492	**
8th Grade Math	0.403	**
8th Grade Reading	0.470	**
** Correlation is significant at the 0.01 level		

A full exploration of the many complex factors that influence testing outcomes, including the economics and demographics of the students, teacher qualifications and more, is well beyond the scope of this paper but across 50 states, increased in per-pupil funding is generally tied to increased test scores.





Do Arizona's per-pupil expenditures appear artificially low because of inaccurate account of state and local funding and bad student counts?

A Joint Legislative Budget Committee (JLBC) memo from September 2012 was written in response to a report from the Center on Budget and Policy Priorities (CBPP) stating that Arizona education funding was cut by 21.8% in FY 2013.³ The JLBC rebuttal of this claim was based on two perceived errors: (1) QTR and SETR property taxes should be counted as state rather than local funding and (2) the student counts used by CBPP were too high, depressing the funding per pupil.

However, QTR and SETR are local, not state property taxes, although their rates are set by state statute. The classification of this money as either state or local is one of the many complicating issues surrounding education financing. Absent the ability to trace the complex relationship between state and local funding in all 50 states, it is not good research practice to apply a correction on one

³ <http://www.azleg.gov/ilbc/cbppreport.pdf>

member of a dataset and not the others.⁴ Arizona’s division of state and local funding may be reported differently than other states, but without further research we cannot know if these discrepancies are unduly biasing the data. However, this issue can largely be address by looking at combined state and local funding, as has been done throughout this paper. Using that unbiased measure, the declines in education funding in Arizona are documented.

JLBC suggests that student counts are overstated between 4% and 9%. Using the upper estimate of 9%, Arizona’s total per-pupil funding would rise from \$8,806 to \$9,599 in FY2011, placing it 45th among the states, rather than 47th. Again, it is inappropriate to make such a correction on a single state and not on all the others. This results in an “apples-to-oranges” comparison and distorts the picture. If one is not able to apply corrections to all members of the dataset, and in the absence of evidence for systematic bias, it is better to assume that such errors are randomly distributed among members.

Don’t we look a lot better if we look at per-classroom funding instead of per-pupil funding?

This line of reasoning assumes that larger classrooms do not have a negative effect on learning, making staff reductions an effective way to lower costs without harming students. However, higher pupil-teacher ratios are negatively correlated with performance on the NAEP test, as seen in the table below. Simply stated, lower test scores are seen with increased class sizes.

Figure 7: Correlation Between Student/Teacher Ratio and 2011 NAEP Scores (50 States)

Test	Spearman’s rho	
4th Grade Math	-0.374	**
4th Grade Reading	-0.510	**
8th Grade Math	-0.345	*
8th Grade Reading	-0.425	**
* Correlation is significant at the 0.05 level		
** Correlation is significant at the 0.01 level		

Using the classroom as the unit of analysis may make some sense in terms of fiscal policy, but in terms of education policy, the proper unit of analysis is the student. The output of any education system is students, not classrooms.

In FY 2011, Arizona spent an average of \$166,609 per classroom, 14% below the \$193,329 national average, placing the state 31st, down from 24th in 2002. By comparison, Arizona is 47th in per-pupil revenue.

⁴ Both the CBPP used data from the National Center for Educational Statistics, which is identical to the Census data used in this report, but their methodology in handling the data is not well documented. For this reason, raw data from the NCES/Census was used when compiling this paper.