Center for American Progress

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Lessons From State Performance on NAEP

Why Some High-Poverty Students Score Better Than Others

By Ulrich Boser and Catherine Brown January 2016

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Introduction and summary

Students from low-income backgrounds face a variety of social and economic challenges that make it more difficult for them to achieve their potential. They often have challenging home lives. They are more likely to have health issues.[1] They are exposed to millions fewer words than their more affluent peers and often lack access to high-quality early childhood education programs that could help them catch up.[2] To make matters worse, low-income students often attend public schools that receive less funding than schools serving more affluent students.[3] If all that were not enough, low-income students also are taught disproportionately by the most inexperienced and out-of-field teachers.[4]

However, it is also clear that some states do a far better job of educating low-income students than others. According to the National Assessment of Educational Progress, or NAEP, there is a massive gap between the states with the highest-performing low-income students and the states with the lowest. For example, in eighth-grade math, students from a low-income background in Massachusetts scored 17 points higher than low-income students in Mississippi.[5] Or think of it this way: Low-income students in Massachusetts are a full grade and a half ahead of low-income students in Mississippi in eighth-grade mathematics.[6]

The Center for American Progress wanted to better understand the role of standards-based reform in promoting student outcomes, and to that end, we studied the most recent NAEP data. Given previous research, we believed that we might find a strong connection between standards-based reform and student outcomes.

Because it can be hard to make clear connections between policy and outcomes, some of our analysis is anecdotal in nature. We also used more-empirical tools for our study, relying on a statistical approach known as a regression analysis to unpack the relationship between standards-based reform and student outcomes. For that part of our analysis, we looked specifically at the performance of low-income students on NAEP over time in relation to a state's standards-based reform efforts, as

measured by the Education Counts database maintained by *Education Week*.[7] Since policy takes time to have an effect across a state, we measured the impacts of policy improvements on NAEP outcomes two years after the actual policy change was adopted, taking into account time for policy to be implemented.

We believe our findings are particularly relevant given the most recent release of NAEP data, and many critics of standards-based reform have expressed concern that NAEP scores did not tick upward between 2013 and 2015.[8] Our research took a more historical look, examining NAEP data over the past decade, and our findings suggest that there is clear evidence that standards-based reform works, particularly when it comes to the needs of low-income students.

Based on our analysis, we found that:

- **Over the past decade, many states that have not fully embraced standards-based reform have fallen behind, while states that have thoughtfully pushed standards have shown clear gains.** From 2003 to 2015, many states that have been historically averse to standards-based reform have shown some of the lowest rates of growth in NAEP scores for low-income students. There are about a dozen states that have shown less than a 5-point gain for low-income students, on average, including Kansas, Iowa, Idaho, Montana, and North and South Dakota. Generally speaking, these states appear to have not embraced standards-based reform fully. Iowa, for instance, was one of the last states to endorse academic standards, adopting them in 1997.[9]

  In fact, two states—North Dakota and South Dakota—actually showed a decline in NAEP scores for low-income populations from 2003 to 2015, on average. In other words, these two states have actually regressed in terms of high-poverty student performance.

  In contrast, the District of Columbia, Tennessee, Massachusetts, and Florida have had some of the largest gains on NAEP for high-poverty students since 2003, and these areas are at the top of a list of states that have posted more than a 10-point jump on NAEP over the past 12 years.

  While there is an important debate over the definition of standards-based reform—and this analysis is undoubtedly anecdotal and impressionistic—it appears clear that states that have not embraced the approach have shown less success, while more reform-oriented states have shown higher gains over the long term.

- **Implementing standards-based reform significantly improved learning outcomes for low-income students in fourth-grade math and eighth-grade reading.** According to our analysis, states typically saw a jump in outcomes due to standards-based reform from 2003 to 2013, and states' standards-based reform effort accounts showed positive outcomes in elementary school math and middle school reading.

  We modeled our analysis on a 2006 study of the impact of standards-based reform on student achievement by researcher Christopher Swanson, which looked at the impact of reforms on NAEP up to that point. Similar to the CAP analysis, Swanson's study relied on *Education Week* data and showed positive NAEP outcomes for states that implemented standards-based reform as measured by the Education Counts indicators.[10] Our analysis took a slightly different approach, accounting for fiscal equity as well as focusing specifically on low-income students.

  Like all regression analyses, variations in our model can shift the outcomes. Without including a fiscal measure, for instance, policy changes generally have a weaker relationship with changes in achievement. That being said, our empirical results, together with our more anecdotal results, make us confident in our overall findings.

- **States posting poor results are among those looking to leave the Common Core State Standards, or Common Core—a set of higher academic K-12 standards in reading and math—which were developed and adopted by governors and chief state school officers in 2010.** Oklahoma and South Carolina have both recently left the Common Core.[11] What is notable about this development is that these two states generally have low levels of achievement, and they score below the national average in almost every tested subject area and grade level. The states also have a long way to go when it comes to low-income students. In South Carolina, for instance, just 14 percent of low-income students are at grade level in middle school math.[12] In Oklahoma, just 13 percent of low-income students are doing grade-level work in middle school math.[13]

  Given these findings, we believe that states should remain dedicated to standards-based reform. The Common Core is the most recent major policy initiative to advance the broader standards-based reform approach. Because of its potential to drive reforms that benefit many students, states should continue their commitment to the Common Core's full implementation and aligned assessments.

A short history of the standards-based reform movement

In many ways, standards-based reform began in 1983 with the release of the groundbreaking report, "A Nation at Risk: The Imperative for Educational Reform," published by the U.S. Department of Education. The report—written by a commission comprised of members representing both political parties, along with business and education leaders—condemned the U.S. public education system for inadequately preparing all students for the workforce, particularly low-income students and students of color.[14]

"The educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people," the report warned. "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war."

The report recommended significant change in five areas: standards; content; time; teachers; and leadership. Specifically, it recommended higher entrance standards for colleges and universities, more instruction time spent on core subjects, regular tests of mastery of content, a professionalized teaching workforce, and particular attention paid to the needs of disadvantaged groups such as low-income students and students of color.[15]

In response to the report's call to action, policymakers sought ways to improve schools across the United States, and many argued that setting clear academic standards for student learning would guide improvements across the whole education system.

Over the next six years, momentum for standards-based reform built until 1989, when President George H.W. Bush hosted an education summit in Charlottesville, Virginia, with the nation's governors. There, governors from both parties worked with the Bush administration to establish and commit to six educational priorities, including that all students would become competent in challenging subject matter.[16]

A few years later, President Bill Clinton signed the Goals 2000: Educate America Act, which expanded on those earlier aims, requiring every state to have grade-level subject area standards and to assess student progress against those standards at least once each in elementary, middle, and high school.[17] This act was the first time that states were required to have academic standards as a condition of receiving federal funds. President Clinton also called for common national academic standards in math and reading that the states would adopt voluntarily.

The national commitment to standards-based reform was reaffirmed in the next reauthorization of ESEA: the No Child Left Behind Act, or NCLB. This law increased the number of times states were required to assess student progress. Specifically, states had to test yearly in third through eighth grade and once in high school.[18] Furthermore, NCLB required the disaggregation of student test scores by student subgroup. This important policy highlighted student achievement gaps. Finally, NCLB required states and districts to intervene in schools that were not improving student achievement.

NCLB, while well-intentioned, was not without its shortcomings. Some states did not do enough to help teachers boost instruction, and some schools became overly focused on test scores. Many states also administered tests that were made up only of multiple-choice items, despite the fact that these sorts of exams do not adequately measure what students should know and be able to do.[19]

The Common Core and standards-based reform today

Today, vast differences in educational opportunities remain. What's more, students in many communities are performing well below grade level. And while standards-based reform has led to some clear success, the nation needs to do far more to boost student learning. That is why the Common Core effort is so important: It builds on the standards movement by raising expectations, creating consistency, and supporting teachers who are looking to hone their craft.

Like previous standards-based reforms, the Common Core arose from the shared desire of educators, policymakers, and other stakeholders to raise academic standards in schools. What is different about the Common Core is that multiple states are adopting the same standards and high-quality aligned assessments for their entire K-12 education system. Local districts also are doing far more when it comes to adopting high-quality curricula and more focused capacity building.[20]

It is important to note that although standards-based reform does not have one consistent definition, the term implies several central components.[21] For one, the effort aims to focus schooling practices around a set of academic standards that specify what students should know and be able to do in each grade level and subject.

For another, the academic standards should guide educators' work in the classroom, helping teachers set goals for students. Advocates also believe that there should be assessments that are aligned to the standards, and that these standards-based assessments should offer students an opportunity to demonstrate how well they have met the standards.[22]

This does not mean that standards-based reforms require teachers to teach in certain ways. Instead, educators—administrators, teachers, and support staff—have the freedom to develop learning experiences for students to attain grade-level standards. That autonomy is balanced with accountability. When schools fail to successfully prepare students for these tests, their states might take action in response. In the most extreme cases, the state might take over the school.

Critics of the Common Core and other standards-based reform efforts argue that the approach creates a one-size-fits-all education system that fosters teaching to the test.[23] And while these criticisms are misplaced, what is clear is that the Common Core will only be successful in improving student outcomes if it drives other positive changes in the education system.

Previous research on standards-based reform

When the federal government released the results of the latest National Assessment of Educational Progress test earlier this year, the results were surprising.[24] From 2013 to 2015, outcomes dipped in some areas, and critics blamed the Common Core.[25] But it is too soon to gauge the success of the new standards. "Big change never happens overnight," Secretary of Education Arne Duncan told reporters. "I'm confident that over the next decade, if we stay committed to this change, we will see historic improvements."[26]

But one can get a better sense of the potential of the new Common Core standards by looking at standards-based reform prior to the Common Core, and as noted above, part of our research effort was based on the work of Editorial Projects in Education's Chris Swanson. In his original study from 2006, he found strong evidence for the power of standards-based reform. Swanson looked at NAEP data from 1997 to 2006 and showed that there is "a consistently positive relationship between achievement gains and the implementation of standards-based policies related to academic-content standards, aligned assessments, and accountability measures."[27]

Other researchers have come to similar conclusions. Joshua Goodman, a researcher at Harvard University, found a positive effect in eighth-grade mathematics when studying the effect of higher-quality academic standards on student achievement, though there were some inconsistent results.[28] Some years ago, the think tank Education Sector studied the impact of higher standards on the achievement of a state's lowest-performing students and found that states with higher standards increased performance at higher rates than states with weaker standards.[29]

There is also significant evidence from other countries that standards can boost achievement. As recounted in Amanda Ripley's book, *The Smartest Kids in the World,* Poland has seen its educational outcomes skyrocket in recent years, and today the Eastern European nation beats out Germany and the United Kingdom when it

comes to Program for International Student Assessment, or PISA, scores.[30] For Ripley, a key factor in the nation's turnaround was the fact that it raised its education standards and implemented a more rigorous and thoughtful instructional system.

One critical piece of standards-based reform is how states hold districts and schools accountable for improving student performance. In an important study of the effects of state accountability systems on student outcomes, researchers Martin Carnoy and Susanna Loeb cataloged the strength of state accountability systems and found higher gains in NAEP in eighth-grade mathematics in high-accountability states.[31] Other key factors in standards-based reform include support for teachers, along with additional dollars for low-income students.[32]

However, not all researchers interpret the impact of standards-based reform positively. For example, researcher Laura Hamilton and her colleagues at the RAND Corporation have found the research to be inconclusive on the whole.[33] But overall, the studies on standards-based reform seem to have found a positive impact. In a recent summary of the research, for instance, researcher Morgan Polikoff asked, "Does standards-based reform and accountability improve student outcomes?"[34] Polikoff concluded that "there is no reasonable way to read the literature and conclude the answer is anything other than 'yes.'"[35]

CAP analysis

In this study, we looked at standards-based reforms over the past dozen years. Specifically, we wanted to see if low-income students in states that had implemented standards-based reforms with greater fidelity performed better than others.

First, we looked across the data to find patterns and trends, trying to connect policy developments to outcomes. It is this line of inquiry that led us to our first conclusion around certain states falling behind due to a lack of standards-based reform.

As part of our work, we also modeled a regression analysis based on researcher Christopher Swanson's previous study. In his report, Swanson looked at the impact of standards-based reform on National Assessment of Educational Progress scores, from 1997 to 2006.[36] He focused on overall changes in policy and achievement from the mid-1990s to the mid-2000s. Our study looked only at the performance of low-income students on NAEP and goes up to 2013. Unlike Swanson, we focused on changes over smaller time intervals—every two years—since the passage of No Child Left Behind in 2002.

As part of our regression analysis, we considered several indicators of standards-based reforms, such as "standards that are clear, specific, and grounded in content," whether state tests were "aligned to state standards," and whether a "state sanctions low-performing schools." We relied on the best data source of this kind—the Education Counts indicators developed by *Education Week*.[37]

For the regression, we created a standards-based reform score for each state. The score was based on the results of the state's performance in three categories: standards; assessments; and accountability. Within each of these categories, there were multiple indicators relevant to that category. In the standards category, for instance, we looked at whether a state had grade-specific academic standards in English language arts, or ELA; mathematics; science; and social studies.

In the assessment category, there were indicators looking at numerous factors, including whether a state had aligned assessments on all three schooling levels—elementary, middle, and high school—and if the assessments included open-ended items on exams. The accountability category also included a number of indicators, including whether a state intervenes in low-performing schools and rewards high-performing schools.

We rolled *Education Week's* indicators of standards-based reform into a policy implementation score, similar to Swanson's original analysis. If a state received credit on an indicator from *Education Week*, then the state had a higher standards-based policy reform score—all else being equal—than a state that did not receive credit on an indicator in our evaluation. On most policies, states were given 1 point for having each policy in place. So if a state's math test aligned with the state's math standards, it received 1 point, and if a state's math test did not align with its math standards, it received 0 points. Some indicators counted for 2 points.

Key indicators of *Education Week's* standards-based reform approach

The indicators in our model fall into three categories, which are listed in the Appendix.

The indicators fell into one of three categories. Standards indicators measured the quality of state content standards in different subjects. Assessment indicators rated whether state tests were aligned with state standards and gave states extra points for including more than just multiple-choice items. Finally, states received points for various aspects of their accountability systems, such as—"reward[ing] high-performing schools" and "sanction[ing] low-performing schools." We normed the results within each category to a final 10-point scale and averaged them.

To account for fiscal equity, we included an indicator about school funding, also from the Education Counts database. This measure expresses the difference between expenditures in the highest- and lowest-spending districts. The indicator is known as the "restricted range" because it ignores outlier districts. States with higher values for this indicator are more inequitable. All results are adjusted for differences in cost of living and student demographics.

Then, we examined the relationship between the states' policy scores over time and their progress on NAEP exams. We performed a regression analysis of these scores against the NAEP results of low-income students in each state. Our analysis

included these changes in policy and states' overall policy scores. Note that since there were not the same number of indicators for each category, some indicators had more weight than others. We provide more information about our regression analysis in the Appendix.

Limitations

Determining how well a state has implemented a set of education reforms over a dozen years is difficult, and there are significant variations and nuances in policy that we were unable to capture in any of our approaches.

For this reason, we used both a qualitative and quantitative approach, looking to see trends in the data and trying to connect those trends to specific policy developments in a state related to standards-based reform.

And while the regression analysis is more empirical, it overlooks significant nuance. *Education Week* was unable to gather information about quality of reforms beyond whether a policy had been implemented. For instance, some state report cards, which contain some of the data upon which this analysis is based, are of higher quality than others.

As noted above, variations in our model also can shift the outcomes. Without including the fiscal measure regarding the restricted range, for instance, policy changes generally have a weaker relationship with changes in achievement.

It is also important to note that how *Education Week* measured some of the state policies did undergo small adjustments over time. In 2007, *Education Week* adjusted the data, including the approach to state standards, changing from whether standards are "clear, specific, and grounded in content" to "course- or grade-specific."[38] Also, after 2007, state standards policies were evaluated biannually rather than annually.

Also, some categories had more indicators than others. For example, a state's accountability policy score is based on four indicators, while the standards and assessments policy scores relied on five indicators, many with multiple subindicators. Therefore, a single change in an accountability indicator would produce a greater change in the state's overall score than a single change in a state's standards policy due to the way that the category was constructed. Still, we believe these data are the most comprehensive available on state standards-based reform policies.

Results

Our analysis of academic achievement over the past decade suggests that standards-based reform efforts have made a positive difference. We found that improvements in state standards-based policies were associated with academic growth for students from low-income families, as measured by the National Assessment of Educational Progress.

Some of this evidence is anecdotal and impressionistic. We found, for instance, that states such as Kansas, Iowa, Idaho, Montana, and North and South Dakota showed some of the lowest gains on NAEP for low-income students since the late 1990s, and broadly speaking, these states have been less committed to standards-based reform.[39] In contrast, many of the states that took a more robust standards-based approach to school reform—such as the District of Columbia, Tennessee, Massachusetts, and Florida—showed some of the largest gains.

Using a more empirical approach—a regression analysis—we found that a 1-point increase in the standards-based policy implementation index was associated with a 0.2-point gain on NAEP in fourth-grade math and a 0.4-point gain in eighth-grade reading. Our model controlled for states' prior NAEP scores and past policy changes, as well as a measure of fiscal equity. We did not find any statistically significant relationships between improvements in standards-based policies and NAEP performance for low-income students in fourth-grade reading or eighth-grade math.[40]

One way to understand our regression findings is to look at specific examples. Take Iowa, for instance. The state has seen relatively limited overall gains on NAEP for low-income students, and we believe that one reason for this is that the state has not fully embraced standards-based reform. During the time period covered by our study, for example, Iowa's standards-based reform policy scores were the lowest of any state in the United States. Likewise, the Hawkeye State did not show much improvement over time in its scores, and by 2013, the state's policy scores were among the nation's lowest.

Our findings are far from conclusive. For one, some of our work is plainly anecdotal and thus potentially suffers from confirmation bias. Also, we have only shown a relationship between implementing standards-based reform policies and improvement on national assessments, and even there, we only found robust results on two of the four NAEP tests.

Our study also did not capture all of the factors that could explain differences in academic performance in states, such as the quality of professional development or the level of school spending. And finally, our measure of policy implementation is limited and may not account for differences in quality of implementation. That being said, we believe that our findings—taken together—are valid.

Recommendations

Embrace the Common Core

Given the positive relationship between standards-based reforms and increased achievement, states should stick with the Common Core and its associated assessments. Unfortunately, some have decided to opt out of the Common Core, including Oklahoma and South Carolina.[41] What is notable is that these states have low achievement, and they score below the national average in most subject areas. For high-poverty students, Oklahoma and South Carolina do a bit better, scoring higher than the national average in some areas. But they still have a long way to go. In South Carolina, for instance, just 14 percent of low-income students are at grade level in middle school math. In Oklahoma, just 13 percent of low-income students are doing grade-level work in middle school math.[42]

Part of the benefit of the Common Core is that it raises expectations for all students. The standards are structured to build on top of one another and lead to college and career readiness. They are also internationally benchmarked against academic standards for high-achieving countries such as Korea and Singapore. The standards also emphasize critical thinking and problem solving—the very skills students need to be competitive in today's workplace.[43]

Before the Common Core, the quality and expectations of state academic standards varied greatly across the country.[44] Many states had weak standards, and Iowa's English language arts standards earned an "F," a failing grade, according to the Fordham Institute.[45] The Common Core standards are a major step forward in this regard, and the new standards were found to be "clearer and more rigorous than the ELA and math standards presently used by the vast majority of states."[46]

Embrace Common Core-aligned assessments and improve testing practices

In our analysis, states received higher standards-based policy scores if they improved their testing practices. Specifically, if a state added more extended-response items, which are more likely to assess higher-level thinking skills on the state tests, the state's policy score would go up. At the same time, we also must acknowledge that some states may continue to use low-quality tests that do not cover all the standards or assess a student's true ability to solve problems and understand concepts. Such low-level tests can lead to a narrowing of curricula and excessive test preparation.

Generally, state assessments up to this point have been low quality, however, the new Common Core tests offer an opportunity to change that dynamic.[47] Typically, the older assessments tested only the most basic knowledge and skills, were misaligned with what students were actually learning in school, and on some tests, students were not even asked to write or show their work. In short, assessments have long failed to make the grade.[48]

On the other hand, the Common Core-aligned assessments are different. They are designed to assess student thinking and problem-solving skills rather than memorization. Therefore, students will need to demonstrate their thinking, apply what they know, and write to be successful on these next-generation assessments. The Smarter Balanced assessments, for example, are computer adaptive, which means that the test gets easier or more challenging depending on student ability.[49] In other words, the exam results would be far more detailed about what students actually know and are able to do. Simply put, by raising the bar for students, tests also have to be improved to accurately measure what students are learning.

Build instructional capacity

Standards-based reform does not happen in a vacuum, and states should support teachers to grow their practice as they transition to the new standards. Among other things, states can help support teachers' professional growth by providing dedicated time for teachers to review and internalize the standards. Many teachers report not having enough time and capacity to delve deeply into the standards or to familiarize themselves with new problems or instructional items.[50] To solve this

problem, districts and schools could provide dedicated Common Core planning time, during which novice educators would work with an experienced teacher to create new lesson plans. Another option would be for schools and districts to pay for teachers to take summer courses or workshops in order to help them get a better sense of the new standards.

States and districts also should create robust curricula, bringing the standards even closer to classroom practices. Between 2002 and 2009, for instance, Maryland supported its teachers in creating a common curriculum that could guide teachers' work.[51] High-quality curricula also can provide teachers with lesson suggestions and instructional materials that can substantially reduce teacher workload as states transition to new standards and associated assessments. Individual districts, such as Washoe County, Nevada, also have supported teachers in creating instructional materials aligned with the Common Core and found ways to give teachers more time to work with each other to develop these standards.[52] But these stories of sustained and thorough commitment to the Common Core are the exception rather than the rule.

Conclusion

Should states continue to use the Common Core standards as a lever for improving outcomes for low-income students? Our research provides an answer, and the evidence on standards-based reform strongly supports the potential of the Common Core to drive improvements in educational outcomes for all students. Our study adds to this body of research, suggesting that states that have embraced standards-driven reforms over the past decade have enabled low-income students to perform at much higher levels.

However, a commitment to new standards and higher-quality assessments will not be enough. States also must build capacity to support educators to rise to the challenges of teaching to the Common Core. Bringing the standards fully to life and achieving their potential requires teachers to master the standards and learn new techniques. States can help make these efforts successful by creating new opportunities for teachers to collaborate and providing new curricular materials that can guide teachers' work. But it all starts with setting high academic standards that support and guide best practice.

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Appendix: Methodology[53]

For this report, we followed the analytic approach taken by Christopher Swanson, vice president of research and development at the Editorial Projects in Education, for his study of standards-based reform and student achievement.[54] Our findings are based on regressions that compared changes in achievement for low-income students with changes in policy. We used a robust fixed-effects model with states as the unit of analysis. We regressed differences in National Assessment of Educational Progress scores for low-income students on measures of their standards-based reform policies and their previous NAEP scores.

To measure student achievement, we used average scores from the NAEP grade-level tests in math and reading. We analyzed changes in test scores between each NAEP administration from 2003 through 2013; namely, 2003–2005, 2005–2007, 2007–2009, 2009–2011, and 2011–2013.

We measured policy differences across states using information from the Education Counts database. We created a policy implementation score that includes several Education Counts indicators that measure various aspects of state standards, assessments, and accountability systems. A full list of the indicators is in Table A1 below, and *Education Week* created the categories within which the indicators were placed. The standards category indicators measure the quality of state standards—for example, are they clear and specific? The assessments category indicators primarily track the alignment of state tests with state standards—for example, does the test measure what is included in state standards? Finally, the accountability category items include information about public reporting and also "rewards" and "sanctions" for schools based on their performance. We included a different subset of the accountability indicators than Swanson.

Education Counts indicators developed by *Education Week* assign points to states that have certain policies in place.[55] Most indicators only counted for 1 point. We note exceptions in Table A1 below. The scores are added up in each major category and then converted to a scale of 10 total points. We focused on two-year internals, shorter time periods than Swanson.

We also included an indicator about school funding equity, also from the Education Counts database. This measure expresses the difference between expenditures in the highest- and lowest-spending districts. The indicator is known as the "restricted range" because it ignores outlier districts. States with higher values for this indicator are more inequitable. All results are adjusted for differences in cost of living and student demographics.

We illustrate our model in the text box below. We regressed the change in NAEP scores over a given two-year period onto policy changes from the same two-year period, controlling for where they started. For example, we regressed changes in fourth-grade reading scores—2009 to 2011—on changes in their policy implementation scores—2009 to 2011—controlling for their 2009 NAEP score, their 2009 policy score, and their 2011 funding equity indicator.

Change in NAEP fourth-grade reading score (from year T-1 to T) is related to change in policy implementation score (T-1 to T) + NAEP fourth-grade reading baseline (T-1) + policy implementation baseline (T-1) + restricted range (T).

Our model could not account for all the factors that could affect student achievement on the NAEP tests. For example, there are factors outside schools' control that might have affected the performance of low-income students. Nevertheless, because we used a fixed-effects model at the state level, we were able to partially account for differences across states. The coefficients from our regression analysis are shown below.

TABLE A1

Results from regression of NAEP scores on standards-based policy measures

	Math		Reading	
	Grade 4	Grade 8	Grade 4	Grade 8
Change in policy implementation score	0.23*	-0.049	-0.19	0.42*
Prior policy score	0.19	-0.12	-0.23	0.34
Prior achievement on NAEP	-0.45**	-0.34**	-0.052**	-0.27**
Restricted range	0.000	0.000	0.000	0.000

* Effect is significant at the p = 0.10 level.

** Effect is significant at the p = 0.05 level.

Note: We do not report the regression constant.

Sources: Authors' analysis based on Education Week policy indicators and NAEP state results, respectively, from Education Counts Research Center, "Select Indicators," available at http://www.edcounts.org/createtable/step1.php (last accessed November 2015); National Center for Education Statistics, "NAEP Data Explorer," available at http://nces.ed.gov/nationsreportcard/naepdata/dataset.aspx (last accessed November 2015).

List of indicators

Standards

1. **Core Standards:**
   - State has standards in the core subjects

     2 = all subjects, 1 = some subjects, 0 = no subjects

2. **Content-based English language arts, or ELA, standards:**
   - State has standards that are clear, specific, and grounded in content in English/language arts in elementary school
   - State has standards that are clear, specific, and grounded in content in English/language arts in middle school
   - State has standards that are clear, specific, and grounded in content in English/language arts in high school

     2 = all grade levels, 1 = some grade levels, 0 = no grade levels

3. **Content-based math standards:**
   - State has standards that are clear, specific, and grounded in content in mathematics in elementary school
   - State has standards that are clear, specific, and grounded in content in mathematics in middle school
   - State has standards that are clear, specific, and grounded in content in mathematics in high school

     2 = all grade levels, 1 = some grade levels, 0 = no grade levels

4. **Content-based science standards:**
   - State has standards that are clear, specific, and grounded in content in science in elementary school
   - State has standards that are clear, specific, and grounded in content in science in middle school
   - State has standards that are clear, specific, and grounded in content in science in high school

     2 = all grade levels, 1 = some grade levels, 0 = no grade levels

5. **Content-based social studies standards:**
   - State has standards that are clear, specific, and grounded in content in social studies in elementary school
   - State has standards that are clear, specific, and grounded in content in social studies in middle school
   - State has standards that are clear, specific, and grounded in content in social studies in high school

     2 = all grade levels, 1 = some grade levels, 0 = no grade levels

Assessments

6. **State assessments include short answer and extended response items**
   - State elementary-school test includes short answer test items
   - State middle-school test includes short answer test items
   - State high-school test includes short answer test items
   - State elementary-school test includes extended response test items in English/writing
   - State middle school test includes extended response test items in English/writing
   - State high-school test includes extended response test items in English/writing
   - State elementary-school test includes extended response test items in subjects other than English/writing
   - State middle-school test includes extended response test items in subjects other than English/writing
   - State high-school test includes extended response test items in subjects other than English/writing

     2 = Short answer AND extended response, 1 = short answer OR extended response, 0 = multiple-choice only or no assessment

7. **State ELA test is aligned to state standards**
   - Elementary-school ELA test is aligned to state standards
   - Middle-school ELA test is aligned to state standards
   - High-school ELA test is aligned to state standards

     1 = any or all grade levels, 0 = no grade levels

8. **State mathematics test is aligned to state standards**
   - Elementary school mathematics test is aligned to state standards
   - Middle-school mathematics test is aligned to state standards
   - High-school mathematics test is aligned to state standards

   1 = any or all grade levels, 0 = no grade levels

9. **State science test is aligned to state standards**
   - Elementary-school science test is aligned to state standards
   - Middle-school science test is aligned to state standards
   - High-school science test is aligned to state standards

   1 = any or all grade levels, 0 = no grade levels

10. **State social studies test is aligned to state standards**
   - Elementary-school social studies/history test is aligned to state standards
   - Middle-school social studies/history test is aligned to state standards
   - High-school social studies/history test is aligned to state standards

   1 = any or all grade levels, 0 = no grade levels

Accountability

11. **State has school report cards**

   1 = yes, 0 = no

12. **State sanctions low-performing schools**

   1 = yes, 0 = no

13. **State rewards high-performing schools**

   1 = yes, 0 = no

14. **State requires exit exams**

   1 = yes, 0 = no

*Subjects were counted as 'yes' if they had indicator in place in any grade level.

Source: List of indicators was retrieved from Education Counts Research Center, "Select Indicators," available at **http://www.edcounts.org/createtable/step1.php** (last accessed November 2015).

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