How is policy affecting classroom instruction?

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Executive Summary

Five-plus years into the experiment with new "college- and career-ready standards" (of which Common Core is the most notable and most controversial example), we know little about teachers' implementation and the ways policy can support that implementation. This paper uses new state-representative teacher survey data to characterize the degree of standards implementation across three states—Kentucky, Ohio, and Texas. We also investigate teachers' perceptions of the extent to which the policy environment supports them to implement the standards. We find a great deal of variation in perceptions of policy, with Ohio teachers perceiving policy to be less supportive than Kentucky or Texas teachers. Teachers in all states are mostly implementing the content in new standards, but they are also teaching a good deal of content they should not—content that has been deemphasized in their grade-level standards. Perceptions of policy do not explain much of the variation in instruction, contrary to our theory. If greater attention is not paid to supporting teachers to implement the standards and reduce coverage of deemphasized content, we worry the standards will not have much effect.

Introduction

The Common Core State Standards (CCSS) have sucked much of the oxygen out of the room when it comes to discussing K-12 educational standards. In the eyes of many American parents, the mere mention of "Common Core" has become a poison pill to members of both parties. But regardless of the political controversies, it's worth asking whether teachers believe in these standards, and whether they might be changing their instruction as a result. Even in non-Common Core states, there are new demands on instruction called for by "college and career ready standards" that merit investigation. We find some evidence that teachers are implementing the content in new standards as expected, but we also find that teachers are implementing content that should have been deemphasized. We see little evidence that teachers' beliefs about state policy are associated with their instructional choices.

As investigators in the Center for Standards, Alignment, Instruction, and Learning (C-SAIL), which is funded by the Institute for Education Sciences (IES), we understand that the term "Common Core" often distracts from a broader discussion of college- and career-readiness standards. The Common Core is one such set of standards, but certainly not the only one, as states have drifted towards their own individualized standards post-Common Core. Texas, after all, never adopted Common Core.

Despite their longstanding place at the heart of education policy, standards-based reforms have only a modest record of success. Certainly, there is some evidence that the accountability pressures that typically come with standards-based reforms can induce student learning gains.[1] But a wide variety of quantitative and qualitative research finds that standards implementation—the extent to which teachers use the standards in classroom instruction—is typically moderate, at best.[2]

This most recent wave of standards-based reform, which started with the CCSS, calls for even more ambitious instructional change than previous versions (for some states). Given these sweeping changes, we wanted to know—have we better learned how to implement standards? Are teachers changing their instruction to match the standards? What are states doing to help teachers adapt?

To answer these questions, we draw on state-representative survey data collected by the C-SAIL project team.[3] Our data and methods are described in full in the appendix, which can be found in the downloadable PDF of this report. While our work is not causal, it provides suggestive evidence on the ways policy can encourage stronger standards implementation and through that, better student achievement outcomes.

How were teachers in our three states different?

To examine teachers' implementation of standards in this new era with these new, more ambitious standards, we draw on the "policy attributes theory."[4] This theory has been used to study teachers' responses to education policy for several decades, and it is the theoretical framework that undergirds C-SAIL's research. The framework posits that five attributes are related to successful policy implementation:

- **Specificity:** How extensive, detailed, and/or prescriptive a policy is.
- **Authority:** How policies gain legitimacy and status through persuasion (e.g., rules or law, historical practice, or charismatic leaders).
- **Consistency:** The extent to which policies are aligned and how policies relate to and support each other. When the policy system is consistent, standards and tests align with each other.
- **Power:** How policies are reinforced and enacted through systems of rewards and sanctions. Policies that have power include incentives for compliance.
- **Stability:** The extent to which policies change or remain constant over time.

Table 1 shows the distribution of the attributes among all teachers across the three states. Texas ranks highest in specificity, power, and stability while Kentucky ranks highest in consistency and authority. According to our theory, differences between states among policy features help explain why teachers may or may not be aligning their instruction with their respective state standards. Every comparison was statistically significant except for consistency, which is only significantly different between Ohio and Kentucky; power, which is not significantly different across any of the three states, and stability, which is only significantly different between Texas and Kentucky.

Table 1. Teacher policy attribute means across states

	Texas teachers n=564-586	Ohio teachers n=379-405	Kentucky teachers n=390-436
Specificity	3.03 (0.89)	2.38 (0.99)	2.75 (0.78)
Consistency	2.82 (0.62)	2.71 (0.56)	2.91 (0.55)
Authority	2.56 (0.69)	2.30 (0.63)	2.78 (0.54)
Power	2.68 (0.67)	2.50 (0.63)	2.56 (0.64)
Stability	2.51 (1.01)	2.44 (0.95)	2.29 (1.02)

Note: Numbers are means and (standard deviations). In general, a 2.0 indicates relatively weak or "somewhat disagree" attitudes, whereas 3.0 represents relatively higher or "somewhat agree" attitudes.

Do teachers' perceptions of policy predict their coverage of standards?

After examining differences in how teachers perceive the attributes of their policy environment, we wanted to see how well these attributes predicted what teachers do in the classroom—specifically, whether teachers were more likely to cover instruction emphasized in their state's standards.

In our predictive models, we wanted to account for several important factors that are likely related to teachers' content coverage. Thus, we control for teacher experience (novice or not), and the following four classroom-level variables: percentage of high-achieving students, percentage of low-achieving students, percentage of students on IEPs, and percentage of ELLs.

Analytic approach

First, we report means for standards emphasized and standards de-emphasized content by grade level, subject, and state.

Second, we run a series of teacher-level regressions where the dependent variables are coverage indices for the emphasized content, and our focal predictors are the five policy attributes, controlling for the descriptive variables listed above. That is, we are examining whether teachers who report higher specificity, consistency, authority, power and stability in their policy environments are more likely to cover the content emphasized in their state's standards.

To what extent are teachers teaching standards-aligned content?

Figures 1 and 2 show the mean teacher reports of coverage of the standards emphasized and de-emphasized content for elementary teachers and then high school teachers. Across states, grade levels, and subjects, responses range from 2.57 to 3.68 (recall 1=no coverage, 2=minor coverage, 3=moderate, and 4=major). From these figures, several patterns emerge.

First, teachers generally report covering the standards emphasized content regardless of state, grade, and subject. The mean coverage score is always greater than 3, ranging from 3.07 for secondary math teachers in Kentucky to 3.59 for secondary ELA teachers in Texas.

Second, we would expect that the coverage of the de-emphasized content would be less than the coverage of the emphasized content. However, we find that in about half the cases there is actually greater reported coverage of the de-emphasized content. In other words, it is not the case that teachers are omitting content in the standards. Instead, they are teaching content emphasized in the standards as well as content that is not emphasized. Previous research is consistent with this idea of teachers adding on to their instruction when presented with a new curriculum or standards, rather than replacing old content.[5]

Third, there are some clear subject and grade-level patterns in the data. In elementary school, mathematics teachers report covering more emphasized content and less de-emphasized content—the pattern we might hope for. This is true for elementary mathematics in all three states, and in all three cases the differences are statistically significant. In contrast, elementary school ELA teachers report covering more de-emphasized content than emphasized content in all three states, though these differences are not statistically significant. In high school, the pattern is exactly opposite— mathematics teachers report covering more de-emphasized content and less emphasized content, while ELA teachers report covering more emphasized content and less de-emphasized content. Our findings were quite consistent across all three surveyed states.

Overall, the results of this analysis suggest that teachers believe they are covering the content emphasized in the standards. However, they also report covering the de-emphasized content, often just

as much as they cover the emphasized content. There are some subjects, grades, and states where teachers seem to do better at emphasizing the content in the standards, especially in elementary mathematics, but this is not the norm.

Figure 1. Content coverage as reported by elementary school teachers in Texas, Ohio, and Kentucky
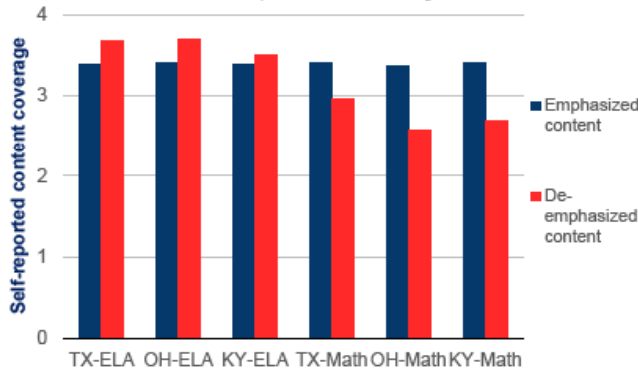
Note: Blue bars represent content emphasized by the standards; red bars are de-emphasized content. According to the standards, we would expect blue bars to be significantly taller than red bars.

Figure 2. Content coverage as reported by secondary school teachers in Texas, Ohio, and Kentucky
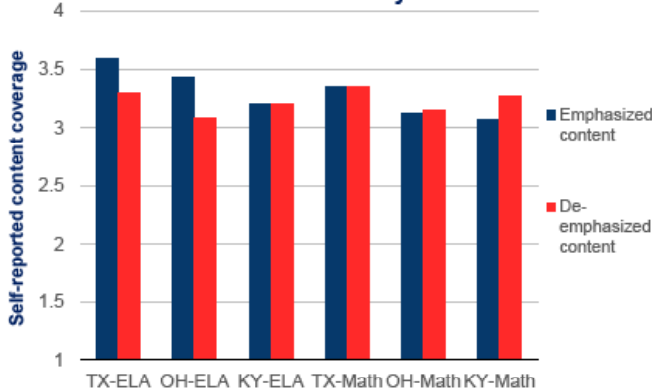
Note: Blue bars represent content emphasized by the standards; red bars are de-emphasized content. According to the standards, we would expect blue bars to be significantly taller than red bars.

Which policy attributes are related to teacher's coverage of the standards?

Table 2 below shows which of the policy attributes significantly predict coverage of emphasized standards content.[6] There were no similarities among predictors across states. Taken together, these results show a) quite weak relationships of policy with reported instruction within states (much weaker than has been found elsewhere), and b) differences across states

in relationships between the attributes and content.[7] Where there were nonzero results, they were more often in the expected positive direction than not.

In general, the results seem more supportive of policy predicting instruction in ELA than in mathematics. Even though statistical significance is modest, 14 of the 15 coefficients across the three states are greater than zero in ELA (as compared to just 9 of 15 in mathematics). Whether the policy attributes are more salient for teachers of ELA than mathematics is a worthwhile question for future investigation.

Table 2. Predictive model for emphasized content using the policy attributes for content coverage

State	TX	OH	KY	TX	OH	KY
	ELA Emph	ELA Emph	ELA Emph	Math Emph	Math Emph	Math Emph
Specificity	0.116***	-0.013	0.046	0.032	-0.035	0.065
Consistency	0.013	0.133*	0.110	0.054	-0.021	0.149
Authority	0.132**	0.093	0.067	-0.089	0.045	-0.128
Power	0.065	0.076	0.025	0.110	-0.066	0.112
Stability	0.017	0.048	0.030	-0.093*	0.063	0.056
N	201	144	165	180	118	111
R^2	0.236	0.154	0.102	0.057	0.172	0.123

Standard errors in parentheses
*p < 0.05, ** p < 0.01, *** p < 0.001*

Conclusion

The latest college- and career-readiness standards sought to encourage certain content effects on teachers' instruction. We do not take a stance on whether these desired changes were "good;" we report whether they had the desired effect. We find that one aspect of the intended shift seems to have occurred—teachers are teaching content emphasized in the standards (though we cannot say they would not have been teaching this content if the standards did not exist). But, another part of the intended shift—moving away from certain content—has not occurred.[8]

The ability of teacher policy perceptions to predict instruction is limited. However, the ability of specificity and authority to predict emphasized instruction among Texas English Language Arts teachers is encouraging, as there may be something particular to Texas that explains the unique associations we see there. Texas has been a nonparticipant in many of the multi-state attempts at standards-based reform, yet it may be having more success.

Texas did not participate in Race to the Top or ascribe to the Common Core State Standards. Yet Texas teachers perceive policy to be more specific than teachers in the other two states, indicating they believe their districts provide more guidance on how to cover the standards. This distinction may be important for future policymakers to consider the efficacy of federally based or cross-state initiatives as opposed to state-based ones. Or, it may suggest that larger states simply have greater capacity for this time-intensive and expensive work.

We know that the standards will not matter much if they do not change what teachers teach. We found that teachers are covering content emphasized by their state's new standards, but teachers are also still covering content not emphasized in the standards. This runs counter to the idea that teachers should focus their instructional efforts on the (already comprehensive) topics and skills in the grade-level standards. Overall, it seems clear that states and districts could provide more support in helping teachers move away from certain content, which we know from previous research is a challenge for teachers. Without these shifts, we cannot say that the policy has been well implemented, which makes it even more difficult to decide whether the standards have a chance to improve student outcomes.

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[1] For a review of this literature see Figlio, D. N., & Loeb, S. (2011). School Accountability. In E. A. Hanushek, S. Machin & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 3, pp. 383-421). North-Holland, The Netherlands: Elsevier.
[2] See for instance Polikoff, M. S. (2012c). Instructional alignment under No Child Left Behind. *American Journal of Education*, 118, 341–368.
[3] This analysis examines select data from a survey administered to teachers in Texas, Ohio and Kentucky during the spring of 2016. We employed a stratified random sampling technique designed to ensure the sample was representative of districts in each state. Forty-two Texas districts, forty-two Ohio districts and eighty-nine Kentucky districts were included in the sample. In each district, we sampled up to two elementary schools and two high schools, making sure to capture representative samples of public, private and charter schools based on demographics. In each of these elementary schools, we sampled two fifth-grade math teachers, two fourth-grade ELA teachers, one teacher of students with disabilities (SWDs) and one teacher of English Language Learners (ELLs). In each high school participating in the study, we sampled two English Language Arts (ELA) teachers and one teacher in each of the following specialties or subjects: SWD, ELL, algebra I, algebra II, and geometry. We chose these three math subjects because they are the most common high school math courses, thus including them maximizes the number of high school target course responses we obtained. Further, we wanted to identify math classes enrolling students who were likely to be required to take the state mathematics assessment. In total 603 out of 1,089 sampled Texas teachers responded, for a response rate of 55 percent; 417 out of 654 sampled Ohio teachers responded, for a rate of 64 percent, and 554 out of 1731 sampled Kentucky teachers responded, for a response rate of 32 percent.
[4] For an early description of the policy attributes theory see Porter, A., Floden, R., Freeman, D., Schmidt, W., & Schwille, J. (1988). Content determinants in elementary school mathematics. In D. A. Grouws & T. J. Cooney (Eds.), *Perspectives on research on effective mathematical teaching* (pp. 96-113). Hillsdale, NJ: Lawrence Erlbaum Associates
[5] Cohen, D. K. (1990). A revolution in one classroom: The case of Mrs. Oublier. *Educational Evaluation and Policy Analysis*, 12(3), 327-345.
[6] We tested a baseline model with no covariates (i.e., only the five policy attributes and no other predictors), and then a full model, which included novice teacher and percentage of high-achieving students, low-achieving students, students with IEPs, and percentage of ELL students. Adding the covariates did not change results for the policy attributes, so we report results of the full model.
[7] See for instance Polikoff, M. S. (2012c). Instructional alignment under No Child Left Behind. *American Journal of Education*, 118, 341–368.
[8] We note that our survey included only a small slice of the content in the complete standards. Results might be different depending on what content we ask teachers to report.
[9] See Porter, 2002.

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EVIDENCE SPEAKS

Appendix

Measures

Dependent variables—content coverage. It can be challenging to obtain valid reports of teachers' instructional practices and content. We specifically designed our teacher survey items to address some of the concerns with obtaining this information accurately. Our survey items on instruction asked a series of questions about the teacher's amount of coverage of different English and math content. We defined content at the intersection of specific topics and levels of cognitive demand (e.g., perform measurement conversions, where "perform" is the cognitive demand and "measurement conversions" is the topic), as we have in previous work. C-SAIL content experts created the list of content items based on an analysis of each state's standards, to identify a sample of content areas that the new standards emphasized, and content areas that were de-emphasized. The items varied by grade level and subject to correspond with the standards; for the full list of items, please refer to Table 2 below.

The survey questions did not indicate which items were emphasized or de-emphasized in the standards. Further, to reduce social desirability responses, all items on the survey were chosen by C-SAIL content experts to include only reasonable content that teachers in that grade might have covered. All items were asked on a scale of 1=no coverage, 2=minor coverage, 3=moderate coverage, and 4=major coverage, and the responses for the items within each category (emphasized and de-emphasized) were averaged to create a total score for emphasized content and de-emphasized content.

Policy attributes

We measured each policy attribute with several survey items, created a composite index for each attribute using the average of the several items, and tested the reliability of each composite. Teachers responded whether they strongly disagreed, somewhat disagreed, somewhat agreed, or strongly agreed with the statements below for specificity, authority and power; we averaged these to create a scale of 1–4 for each construct. For consistency, teachers indicated their opinion on the degree to which a set of policy documents were aligned to state standards (1–not at all aligned, 2–somewhat aligned, 3–aligned, 4–strongly aligned). For stability, teachers responded how long they thought a set of policies would last (1=1–2 years, 2=3 years, 3=4 years, 4=5+ years). These items are summarized in Table 1 below. Alpha reliabilities range from .64 to .92.

Appendix Table 1. Survey items measuring the policy attributes

Specificity (3 items)	CCR standards clearly indicate the content I teach.
	I have received guidance from my district that clearly indicates the order in which I should teach each content area.
	Teachers have received guidance from my district that clearly indicates how much time we should spend on each content area.
Consistency (9 items)	The English Language Arts or math sections of the test
	District-mandated summative assessments
	Formative or diagnostic assessments selected or created by schools
	Formative or diagnostic assessments used district-wide
	Textbooks used in your school
	Curriculum selected or developed by your district
	State-developed or organized professional development activities that you've participated in this year.
	District-developed or organized professional development activities that you've participated in this year.

	Administrator feedback provided to you from observations (i.e., walkthroughs, formal observations, etc.)
Authority (13 items)	CCR standards for ELA or math positively affect the degree to which students are prepared for middle school
	CCR standards for ELA or math make learning relevant to everyday lives
	Since starting to implement for CCR standards for ELA or math, I have made instructional shifts to ensure students meet those standards.
	Students' results from the ELA or math section provide valuable information about how well my students are mastering CCR standards for ELA or math.
	CCR standards for ELA or math exclude important content that students should learn.
	CCR standards for ELA or math provide a manageable number of topics to teach in a school year, for my grade level.
	CCR standards for ELA or math give educators the flexibility they need to help students who are below grade level.
	CCR standards for ELA or math are more rigorous than previous state standards.
	Students' results from the ELA or math sections of the state test are useful for improving my practice.
	CCR standards for ELA or math set appropriate expectations for English Language Learners.
	CCR standards for ELA or math set appropriate expectations for students with diabilities.
	CCR standards for ELA or math set appropriate expectations for students learning at each grade level.
	I plan lessons with CCR standards for ELA or math in mind.
Power (4 items)	Teachers who poorly implement CCR standards for math or ELA will have a lower summative evaluation rating.
	There are negative repercussions for teachers at this school whose students performed poorly on the state test
	Teachers at this school are recognized for using exemplary classroom practices that support the implementation of CCR standards for math or ELA.
	Teachers at this school ar erecognized for their students' achievement gains on the state test.
Stability (3 items)	CCR standards for ELA or math
	The ELA or math section of state test
	The current proficiency standards (i.e., cut scores) for the state test

Table 2 lists the content that falls under both categories for every surveyed subject. To obtain the list of emphasized and de-emphasized content, we used the following process. We started with existing content analyses of state standards in our partner states pre-NCLB. These data listed the topic and cognitive demands that trained raters coded the standards as covering. These were what teachers in these states should have been teaching before their new college- and career-readiness standards. We compared these to content analyses of the new CCR standards in each state. We determined the particular content that saw the greatest average proportional increase at each grade level from pre-CCR to CCR standards, and we called this the "emphasized"

content. The "de-emphasized" content was the content that saw the greatest decrease in coverage from pre-CCR to CCR standards.

Appendix Table 2. Instructional content items by emphasis, comparing new to old standards

<u>Emphasized content</u>	<u>De-emphasized content</u>
Elementary English Language Arts	
Apply grammatical rules	Apply cognitive strategies when reading
Compare multiple texts on the same theme	Demonstrate correct spelling rules
Demonstrate ability to write different forms of text	Identify main, key and supporting ideas, and details
Engage in effective conversation and discussion with peers	Interpret words and phrases with multiple meanings
Identify correct meaning within context for words with multiple meanings	Locate and use textual evidence to support comprehension
High School English Language Arts	
Analyze vocabulary choices in different forms of text (e.g., use technical or figurative language as appropriate)	Identify rhyme scheme in a poem
Apply rules for capitalization and punctuation	Demonstrate correct grammar rules
Identify similar themes in multiple texts	Discuss the characteristics of different genres of text
Demonstrate ability to write for different purposes	Locate and use textual evidence to support comprehension
Demonstrate speaking and listening skills in different engagements with peers (e.g., conversations, discussions, debates)	Vary sentence construction in writing
Elementary Math	
Demonstrate understanding of angle measurement	Calculate simple probabilities
Demonstrate understanding of fraction multiplication	Demonstrate understanding of data in tables or graphs
Perform the procedures of adding and subtracting fractions	Demonstrate understanding of geometric or arithmetic patterns
Represent fractions	Demonstrate understanding of rate of change/slope
Solve one-step equations	Perform measurement conversions
Algebra	
Demonstrate understanding of angle measurement	Compute with exponents and radicals (e.g., square roots)
Demonstrate understanding of fraction multiplication	Demonstrate understanding of estimation
Perform the procedures of adding and subtracting fractions	Find the factors of an algebraic expression
Represent fractions	Perform operations on polynomials
Solve one-step equations	Perform procedures involving rate of change/slope
Algebra 2	
Perform procedures with complex numbers	Solve systems of equations
Demonstrate understanding of linear functions	Memorize the symbolic representation for a linear function
Apply functions to real world settings	Perform procedures on polynomials
Demonstrate understanding of polynomials	Perform operations on exponential expressions

Demonstrate understanding of inequalities	Memorize attributes of exponential functions
Geometry	
Demonstrate understanding of rigid transformations (e.g., slides/translations, flips/reflections, turns/rotations)	Perform procedures associated with triangles
Use geometry to model situations (e.g., use circles, three-dimensional objects to model real-world situations)	Memorize definitions and formulas associated with triangles
Demonstrate understanding of similarity	Perform procedures to determine angle measures
Justify properties of circles	Memorize definitions and formulas associated with quadrilaterals
Generalize transformations to other concepts (e.g., congruence)	Perform procedures associated with circles