Evaluating the Impact of Professional Development to Meet Challenging Writing Standards in High-Need Elementary Schools

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Prepared for:

Dr. Linda Friedrich, Director of Research and Evaluation
National Writing Project
2105 Bancroft Way #1042
University of California
Berkeley, CA 94720-1042

Research conducted by SRI International

H. Alix Gallagher
Katrina R. Woodworth
Christina J. Park
Teresa McCaffrey

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Executive Summary

Writing is an essential skill for participating in modern American society. Although it is crucial to careers and civic engagement, student writing falls far short of national expectations (College Board, 2004; NAEP, 2011; Persky, Daane, & Jin, 2003). Until recently, national policy, notably the No Child Left Behind Act of 2001 (NCLB), may have exacerbated the problem by focusing attention on student performance in reading and mathematics—sometimes at the expense of other academic areas (Center on Education Policy, 2005). More recently the Common Core State Standards for English Language Arts (CCSS-ELA), adopted by 45 states as of January 2014, signal the importance of writing and call for changes to the role of writing in schools.

Three major changes to instruction are implicit in the CCSS-ELA: (1) a shift in the types of writing on which instruction is focused, (2) an increasing emphasis on writing in the overall instructional program, and (3) a focus on writing (and writing instruction) across the disciplines (Calkins, Ehrenworth, & Lehman, 2012; Rothman, 2011). The shift in the types of writing seeks to increase the amount of argument and informative/explanatory writing (relative to narrative writing) in schools, reflecting the greater emphasis that both higher education and careers now place on these types of writing than narrative writing (Cutler & Graham, 2008; Rothman, 2011). Additionally, the CCSS-ELA specify that students across all grades should "write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes and audiences" (Common Core State Standards Initiative, 2010, p. 18).

The National Writing Project—a national network comprising nearly 200 university-based Local Writing Project sites—is well positioned to support educators across the country in developing knowledge and skills to change their practices to align with the CCSS-ELA.

SEED Professional Development and Evaluation

In March 2012, the National Writing Project was awarded a 1-year federal grant under the Title II Supporting Effective Educator Development (SEED) grant program. The National Writing Project used a portion of the SEED grant funds to provide intensive in-service to high-need elementary schools focused on CCSS-ELA implementation in third, fourth, and fifth grades.[1] As soon as the grant was awarded, the National Writing Project leadership team began refining the program and recruiting Local Writing Project sites; the sites in turn recruited school partners. In most cases, the professional development began in August 2012 and ended in May 2013.

The National Writing Project specified "nonnegotiables" based on research on effective professional development and an understanding of CCSS-ELA to guide Local Writing Project sites' work on the SEED grant. These nonnegotiables included the following criteria:

- At least 75% of third-, fourth-, and fifth-grade teachers participate in at least 45 hours of SEED professional development
- Joint ongoing planning and review of professional development by site and school
- A variety of professional development delivery strategies
- A focus on supporting teachers as they work to teach to the CCSS-ELA in writing

Once Local Writing Project sites were awarded grants, site and school personnel collaborated to develop individual logic models for the intensive in-service work. Based on these logic models, representatives from the Local Writing Project sites (university faculty and teacher leaders), schools, and the National Writing Project identified additional shared components of SEED professional development. The "common agreements" included establishing common goals and language at each school for argument/opinion/persuasive writing, focusing on teaching argument, using in-class model lessons and model texts, engaging teachers in writing, examining student writing, and engaging students' "funds of knowledge."

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[1] The SEED work initially included a focus on any college-and career-ready standards. However, all participating schools were located in states that had adopted CCSS, and so the work focused on the college- and career-ready standards adopted by the states in which participating schools were located—namely CCSS.

Local Writing Project sites maintained their usual autonomy in determining—typically in collaboration with school-based leaders—how to put these nonnegotiables and common agreements into practice in their work with participating schools.

SRI International designed an evaluation to estimate the effects of the SEED professional development on teachers' writing instruction and student argument writing, while documenting implementation of the SEED program (i.e., examining adherence to the nonnegotiables and common agreements) and attending to the contexts in which the program was implemented. The evaluation was designed as a cluster randomized controlled trial (RCT) in which 44 schools, served by 14 Local Writing Project sites, were assigned to either the treatment or control condition.[2] Because of the nature of the SEED funding, both the professional development and the evaluation spanned a single school year (2012–13).

Members of the SRI research team and National Writing Project staff together formalized the SEED evaluation framework. In addition to specifying the key components of SEED professional development, the evaluation framework explicitly anticipated the important role that contextual factors play in shaping teachers' existing knowledge, skills, beliefs, and practice, and their response to the professional development. These contextual factors include existing curricula, accountability policies and pressures, school leadership, and the extent of focus on the CCSS, among others. Drawing on the National Writing Project staff's vision for the SEED program as well as the recent IES *Educator's Practice Guide* on elementary-level writing instruction (Graham et al., 2012), the evaluation framework detailed the teacher knowledge, skills, beliefs, and practices and student outcomes expected to increase as a result of the SEED professional development. SRI measured the core elements of the evaluation framework through on-demand writing prompts, a teacher survey, interviews and Local Writing Project site/school visits, and professional development monitoring forms (that tracked the amount and nature of the professional development in which teachers participated).

[2] In January 2013, one school attrited from the study and SRI dropped its pair, reducing the final sample to 42 schools.

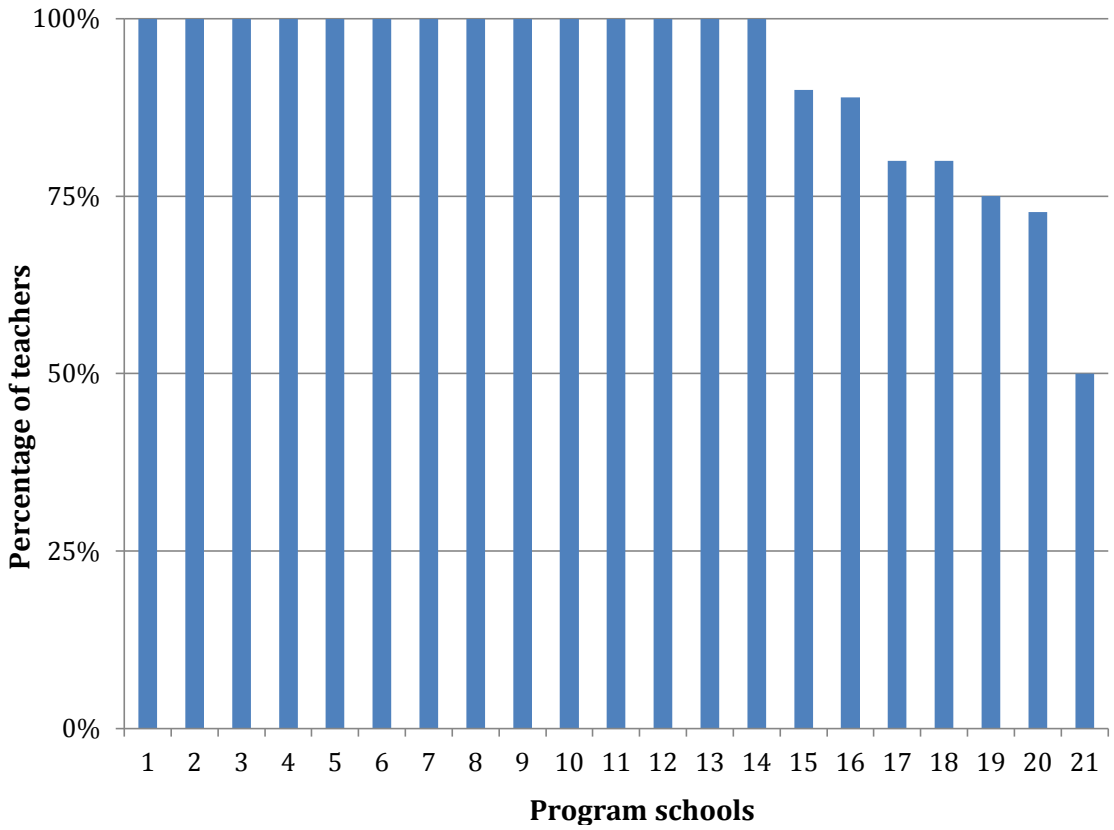
Key Findings

This summary reports key findings on SEED program implementation and the context in which it was implemented, teacher outcomes, and student outcomes.

Local Writing Project sites implemented the SEED professional development with fidelity.

The SEED program sought to provide 75% of third- through fifth-grade teachers in program schools 45 hours or more of SEED professional development. Twelve of 21 schools attained this threshold and, when the threshold is lowered slightly to 40 hours, 19 schools attained the mark (Exhibit ES-1).

Exhibit ES-1. Teachers' rates of participation in 40 or more hours of professional development, by SEED program school



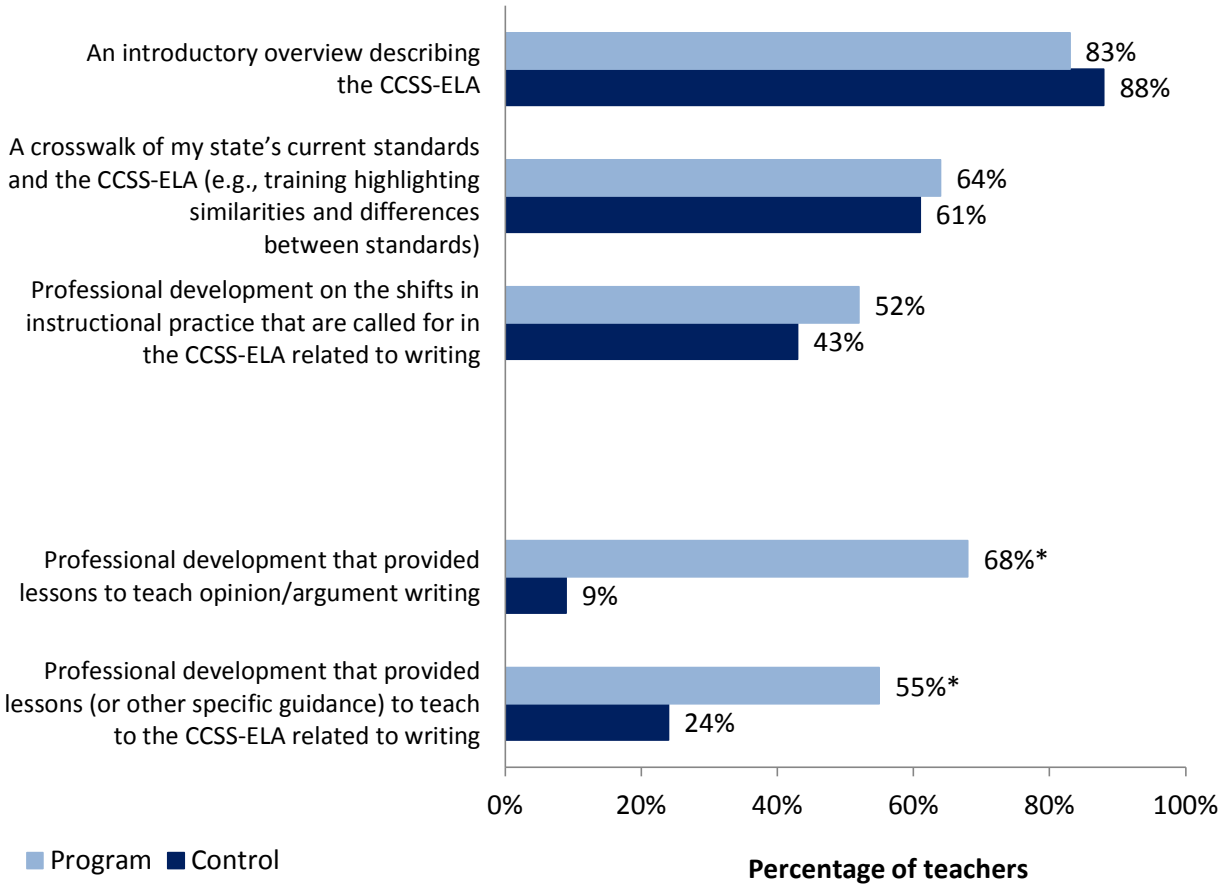
Source: Professional development monitoring.

Teachers in control schools were allowed to attend district-mandated professional development. Nonetheless, program school teachers' hours of participation in writing

professional development far exceeded control school teachers' participation in writing professional development, with program teachers reporting an average of 61 hours of writing professional development compared to 8 hours for control teachers.

While teachers at both program and control schools participated in introductory professional development on the CCSS-ELA, the SEED professional development included more guidance on teaching argument writing and teaching to the CCSS-ELA related to writing (ES-2).

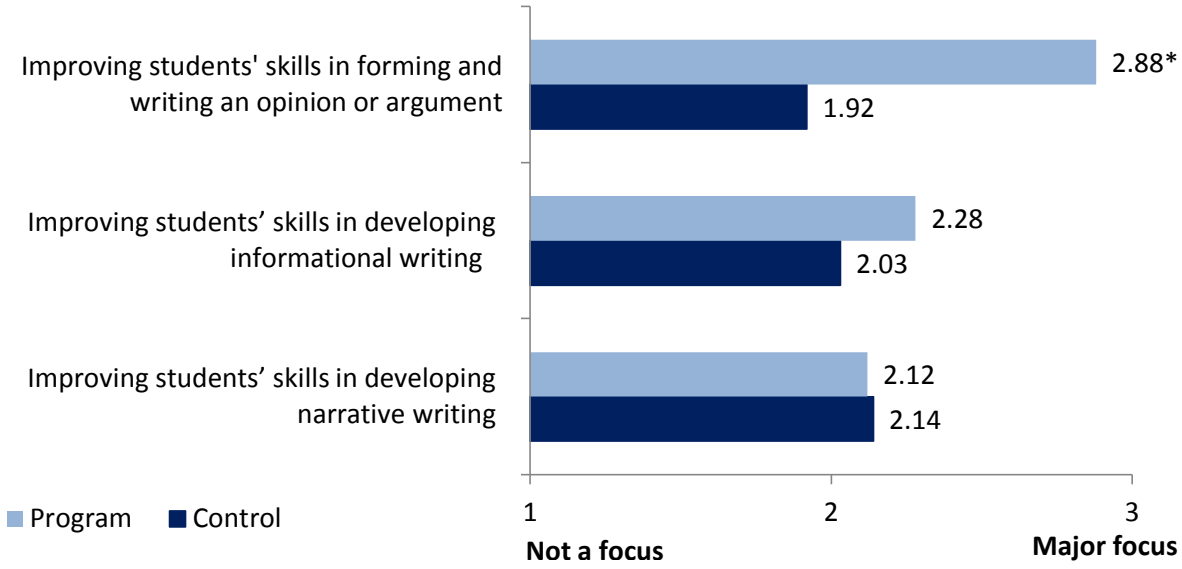
Exhibit ES-2. Frequency with which teachers identified CCSS-ELA foci of professional development, among those who participated in professional development on the CCSS-ELA



*Note: * denotes a statistically significant difference (*p < .05*) between program and control groups.*
Source: SEED teacher surveys.

In line with the goals of the SEED program, SEED professional development focused on argument writing to a greater extent than did professional development in control schools (Exhibit ES-3).

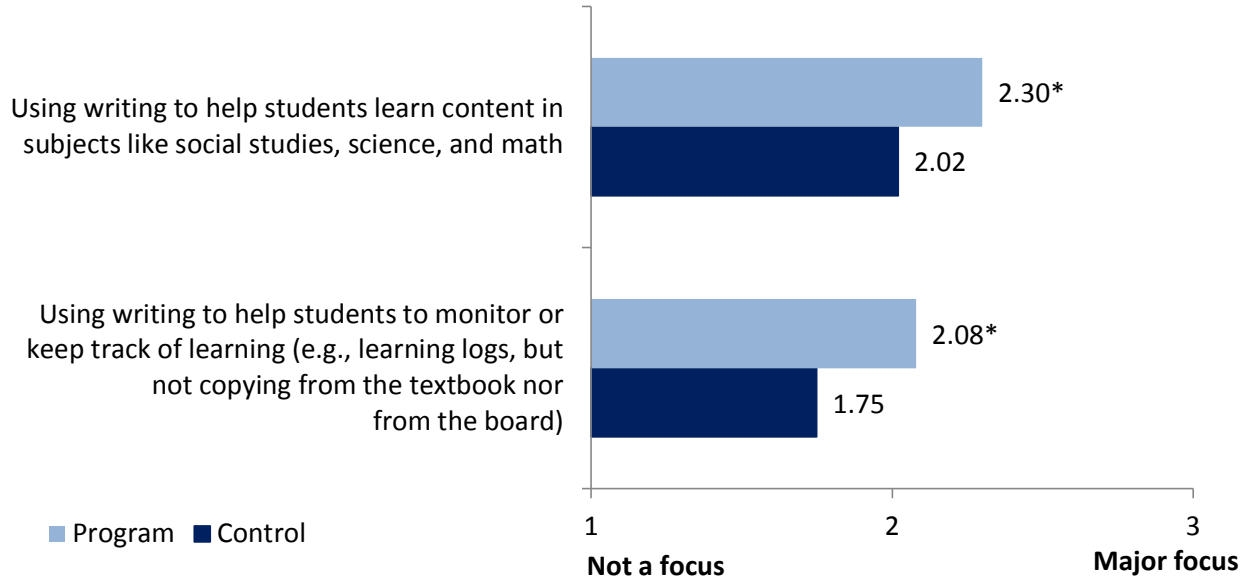
Exhibit ES-3. Teachers' reports on the focus on types of writing in professional development (means), among those who participated in writing professional development



*Note: * denotes a statistically significant difference (*p < .05*) between program and control groups.*
Source: SEED teacher surveys.

SEED professional development also reflected common, research-based Writing Project practices that were not specified in the SEED design principles but were reflected in the evaluation framework. In particular, SEED professional development focused on using writing to learn and to keep track of learning across content areas to a greater extent than did professional development in control schools (Exhibit ES-4)

Exhibit ES-4. Teachers' reports on the focus on writing to learn and to monitor learning in professional development (means), among those who participated in writing professional development



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys.

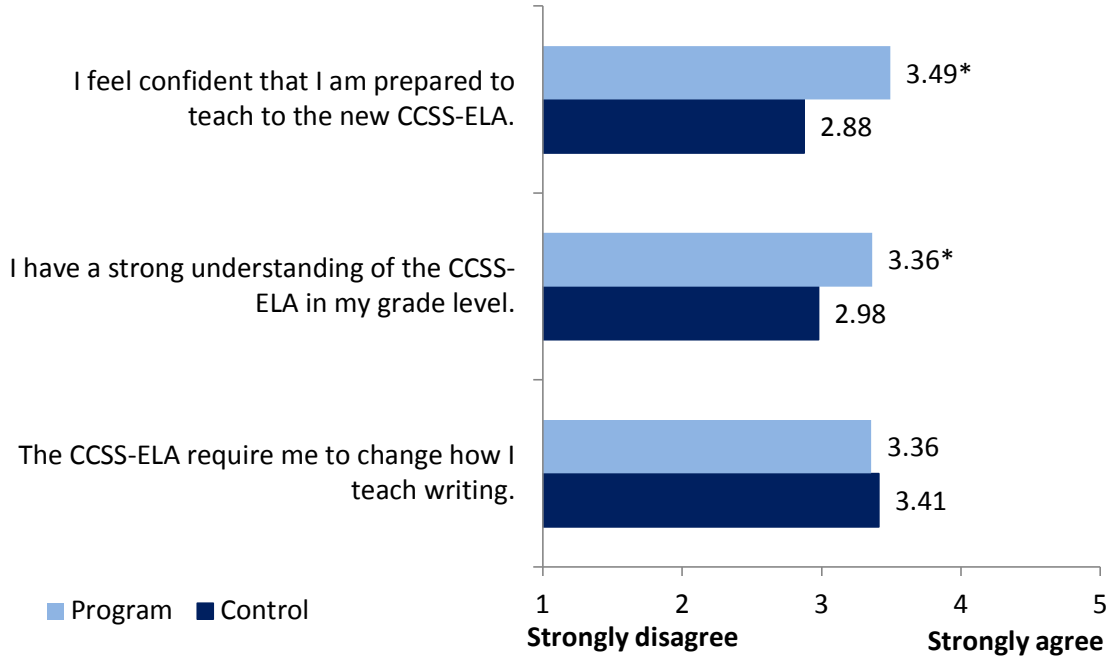
The SEED program improved teacher knowledge and confidence about the CCSS-ELA, but many teachers were unclear about the implications of the CCSS-ELA for their instruction.

In general, the extent to which the CCSS-ELA lead to improved student writing depends on teachers' instructional practice. Prior research on policy implementation and changes in teacher practice suggests that the process by which policies influence instruction is complex and varies across individuals and contexts. For policies to impact teacher practice, teachers must first understand the policy and its implications for their practice. With their context and prior knowledge as a lens, teachers then respond to the policy in ways that may be more or less aligned with the initial intent of the policy (Lipsky, 1978; McLaughlin, 1987; Spillane, Reiser, & Reimer, 2002). Professional development can play a crucial role in helping teachers to understand new policies, revise their vision of effective instruction, and acquire the strategies necessary to implement that vision in their classrooms.

The baseline teacher survey provided a description of program teachers' practices prior to the SEED program and suggested that writing had a relatively small place in the curriculum at program schools in the year preceding schools' participation in SEED professional

development. This finding implies that to fully implement the CCSS-ELA during the implementation year, teachers would need to make substantial shifts in their instructional practices. Importantly, while SEED professional development had positive impacts on teachers' confidence in their ability to teach to the CCSS-ELA and their understanding of how to teach to the CCSS-ELA, the professional development did not impact teachers' sense that they would need to change their practice in response to the CCSS-ELA (Exhibit ES-6).

Exhibit ES-6. Teachers' reported self-confidence in their knowledge and skills related to the CCSS-ELA (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys.

Despite the positive impacts of the SEED professional development, in all cases, the averages for program schools hovered between three and four on the five-point scale, suggesting that after 1 year of SEED, teachers did not yet feel confident about the CCSS-ELA and its implications for their teaching.

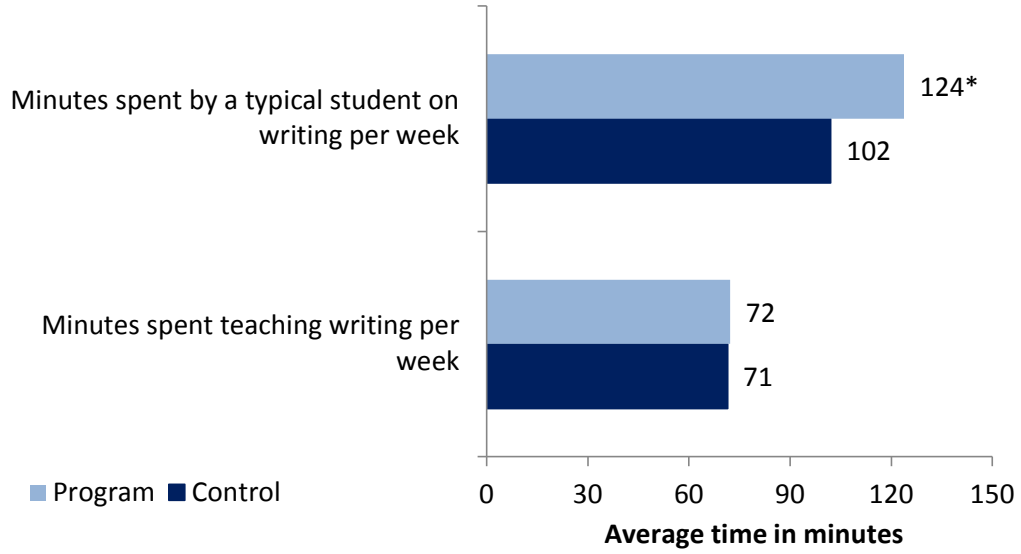
The SEED program positively impacted the amount of time students spent writing. There is no evidence of impact on the time teachers spent teaching writing, the length of student writing, or the time frame over which writing tasks extended.

The Institute for Educational Sciences' *Educator's Practice Guide, Teaching Elementary School Students to Be Effective Writers* reflects the field's current understandings of instructional practices in elementary school writing that are believed to contribute to improved student writing (Graham et al., 2012).[3] *Teaching Elementary School Students to Be Effective Writers* recommends that educators provide daily time for writing—about 30 minutes of writing instruction and an additional 30 minutes for students to practice writing.

SEED professional development impacted how much time students spent writing, but not how much time teachers spent teaching writing. While SEED led to a difference of 20 minutes a week in the time teachers reported students spent writing in program schools compared to control schools, the overall amount of instructional and student practice time spent on writing was still far below recommended levels. Additionally, the cumulative difference is relatively small—if we assume a 180-day (and therefore 36-week) school year, teachers in program schools reported students spent 12 more hours writing, and received no more writing instruction, over the course of the year than teachers reported in control schools (Exhibit ES-6).

[3] This report was based on a search that yielded 1,500 citations for research conducted in the last 20 years on writing instruction and strategies. Of these, 34 were both topically relevant and met What Works Clearinghouse Standards for evidence, and so formed the basis of the review.

Exhibit ES-6. Teachers' reports on minutes students spent writing and teachers spent teaching writing per week (model-adjusted means)



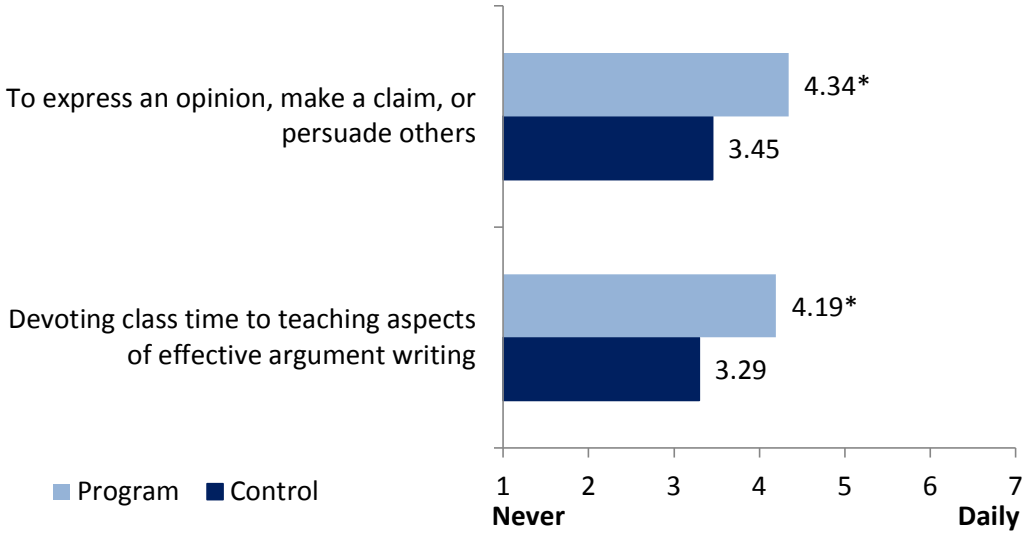
*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys.

Furthermore, there was no evidence that SEED professional development impacted the length of student writing or students' opportunity to work on a single piece of writing over time. Interview data suggest that both the way that instructional time was divided during the school day and pressures to focus instructional time on tested subjects were major barriers to increasing the role of writing in instruction.

SEED professional development impacted the teaching of argument writing and the use of writing for broader learning. However, deeper instructional shifts may have been inhibited by contextual factors.

SEED professional development focused heavily on argument writing. Data show it impacted how frequently teachers asked students to write for the purpose of expressing an opinion or taught aspects of effective argument writing (Exhibit ES-7).

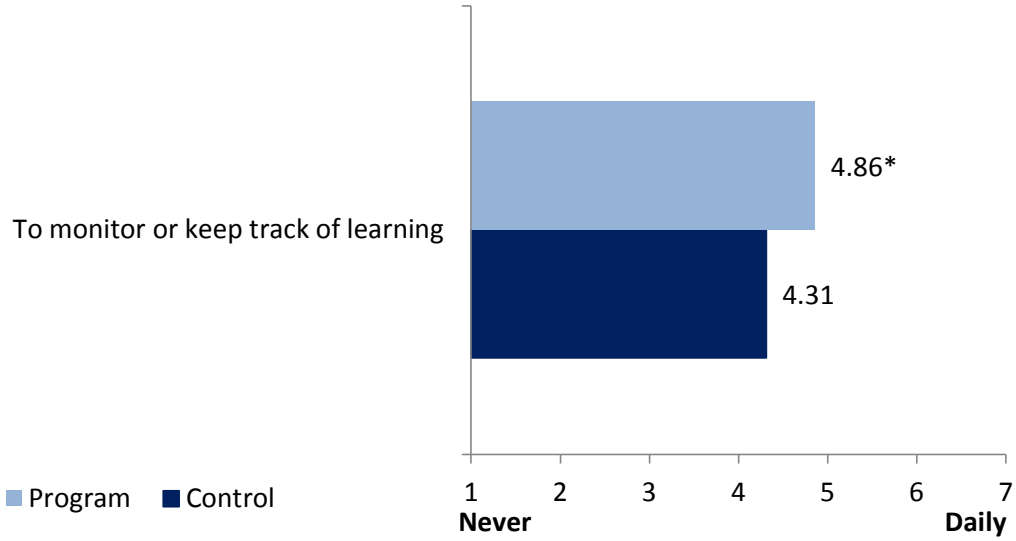
Exhibit ES-7. Teachers' reports of frequency of asking students to write opinion/argument or persuasive text and teaching aspects of effective argument writing (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys

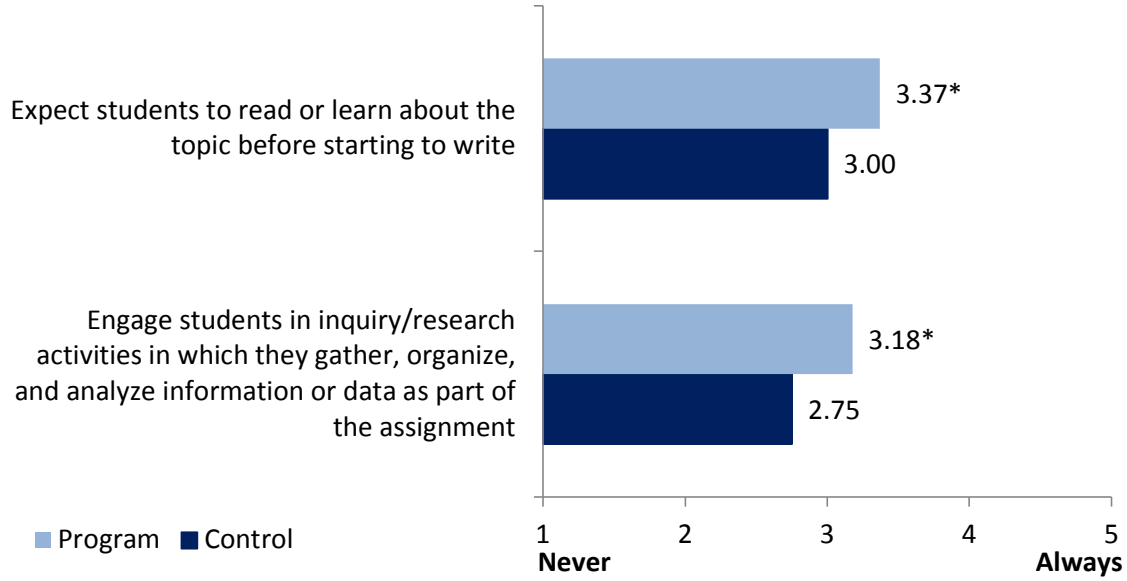
Moreover, key among the research-based practices that SEED tried to influence was teachers' use of writing as an integral part of broader learning. SEED had positive impacts on teachers' asking students to write for the purpose of monitoring learning (Exhibit ES-8) and using writing as part of larger learning activities (Exhibit ES-9).

Exhibit ES-8. Teachers' reports of the frequency with which they asked students to write to monitor learning (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys.

Exhibit ES-9. Teachers' reports of the frequency with which they asked students to write as part of larger learning activities (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups*
Source: SEED teacher surveys.

Teachers' reports on their instructional practices suggest that SEED impacted some practices that research suggests are critical for teaching elementary students to write. The data also suggest that teachers' instructional practices were not transformed across the board, which is not surprising for a 1-year program implemented in schools that were, in many cases, just beginning a larger process of adapting their curriculum to the new requirements of the CCSS-ELA. Some of the deeper shifts in teacher practice that may be necessary to fully meet the CCSS-ELA—for example, the amount of writing instruction teachers provide—were not impacted. The survey and interview data combine to suggest a few reasons for these mixed results.

First, teachers' instructional context put upper bounds on students' opportunities to learn to write. Most specifically, teachers felt limited by the amount of time they felt they could spend on writing instruction and (relatedly) the ways accountability pressures pushed teachers away from using that instructional time for engaging students in strategies for writing and revising longer pieces of writing.

Secondly, there was substantial variation within schools in the extent and nature of changes to instructional practice that teachers reported. Some teachers appeared more eager to change their practices than others, which is in line with general understandings of organizational change (Fullan, 2001).

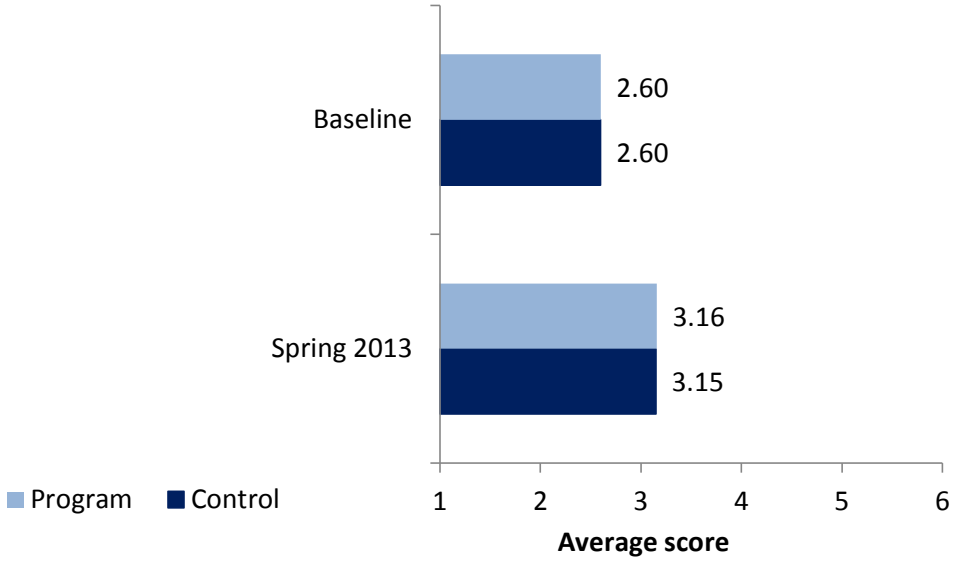
Finally, for the most part, teachers took model lessons or activities learned through their professional development and tried them in their classrooms, but they rarely took strategies from professional development and used them as the basis for revising their overall approach to writing instruction. Changes teachers made beyond implementing specific activities in their classrooms typically were those that could be made by tweaking existing practices as opposed to those that would have required larger shifts in pedagogical approaches or uses of instructional time.

There is no evidence that 1 year of SEED professional development impacted students' argument writing.

The ultimate goal of SEED is to improve the quality of students' argument writing. We conducted an intent-to-treat analysis using the "Analytic Writing Continuum (AWC)

average score," created by averaging scores across six attributes for each student.[4] The results can be interpreted as the mean effect on student AWC average scores for third-, fourth-, and fifth-graders caused by attending a school that participated in 1 year of the National Writing Project's SEED grant. There was no evidence of impact from schools' participation in 1 year of SEED professional development on the quality of student opinion writing in response to an on-demand prompt (Exhibit ES-10).

Exhibit ES-10. Students' AWC average scores in fall 2012 and spring 2013 (averaged across third, fourth, and fifth grades) (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: Student writing prompts, fall 2012 and spring 2013.

[4] Researchers, in consultation with the National Writing Project, selected the AWC average score as the primary outcome measure because the SEED program sought to improve the overall quality of students' argument writing (as opposed to any one particular aspect) and prior research showed a high correlation among the attributes (Bang, 2013).

Implications

This report presents data to support several positive findings about the SEED professional development and its impact on teachers' writing instruction. First, Local Writing Project sites provided professional development that was aligned with consensus in the field about the features of effective professional development (see Yoon, Duncan, Lee, Scarloss, & Shapley, 2007), was consistent with the design principles of the SEED program, and was different—more intensive and focused on opinion writing and implementation of the CCSS-ELA in writing—than the writing professional development received by the control group. In turn, the data show an impact on survey measures related to time students spent writing, teacher instruction on opinion writing, and teachers' use of writing as part of larger learning activities.

However, despite the research-based attributes of the SEED professional development and its influences on program school teachers' instructional practices, SEED professional development did not impact student argument writing as measured by on-demand prompts scored on the National Writing Project's AWC. The lack of evidence of impact on student outcomes raises the question: why not?

Looking across our data on teacher practices, what we found stands in contrast to what the writing instruction research (i.e., Graham et al., 2012) suggests students should have. At the most basic level, students did not have access to the opportunities to learn to write that research indicates they need. Interview data suggest that limited time devoted to writing is partially a legacy of NCLB (and related state and local instructional policies) and the tendency of schools to narrow the curriculum to focus on the most heavily-tested subjects. State English language arts tests have tended to focus on multiple-choice grammar and conventions questions, sometimes on short answer or constructed-response items, and less frequently on extended, nonformulaic writing. While the CCSS-ELA send different signals about writing instruction, implementation was in a very early stage and assessments were not yet aligned with the new standards.

Another element of context for this research is the short time frame of the intervention and evaluation. This study is part of a growing collection of rigorous studies of professional development that had features that mark "effective" professional development but that did not find impacts on student outcomes. It seems likely that absent a surrounding context that is highly supportive of teacher learning and change, professional development does

not alter instructional practices sufficiently and rapidly enough to impact student outcomes in less than a year.

Based on the evaluation's key findings and an understanding of the context in which the National Writing Project's SEED program was implemented, we offer implications for state and district policymakers and school leaders, professional development providers, and researchers. We frame our findings within existing research on policy implementation.

State and district policymakers and school leaders. Research suggests that teachers' decisions (e.g., to change their instructional practices in writing) are influenced by the broader system of ideas, incentives, and sanctions present in their instructional context (Smith & O'Day, 1991). This research implies that if policymakers hope to see students moving towards the CCSS-ELA in writing, they will need to change the instructional policies and expectations that currently prevent writing from taking a more prominent role in instruction. If state tests do not assess students' skills at more extended writing, teachers, schools, and districts will not have the support and pressure necessary to ensure that writing is prioritized. District-level instructional guidance that reinforces the notion of teaching disciplines in isolation is another aspect of this problem. Moreover, schools and districts need to provide teachers necessary resources, in terms of time to enhance their own learning and to redesign their instruction, materials, and the space to try out new ideas.

Professional development providers. Research on cognition and how it affects teachers' responses to substantially different ideas about instructional practices frames implications for professional development providers. Spillane et al. (2002) reviewed studies of past attempts to use standards to reform teaching to more inquiry-oriented approaches. Spillane et al.'s work suggests that a challenge for professional development providers in the early stages of this reform may be teachers' level of understanding of what instruction aligned with new standards would actually look like. Our survey and interview data indicate that many teachers were not yet confident that they knew how to teach to the CCSS-ELA; the data do not address the additional possibility that some teachers' conceptions of instruction aligned with the CCSS-ELA may differ from those intended by the policy. Professional development providers will need to help teachers envision the destination (i.e., a research-based instructional environment for student writing) as well as the path for moving from their current practices to those that are in line with the CCSS-ELA.

Researchers. Finally, this study has implications for future research. Our data clearly show that the impact of SEED professional development cannot be understood absent data on the context in which it was implemented. Given the context-related constraints for change, it might have been impossible for 45 hours of teacher professional development on writing instruction, on its own, to have measurably impacted student writing in 1 school year. Teachers started in very different places, and the barriers to deep and rapid change were so pervasive, that it is hard to imagine how teacher learning could translate into measurably improved student writing in the course of 1 school year. The implication for researchers, including those implementing randomized controlled trials, is the need to collect data not only on implementation and impact but also on context. In our study, some of the most compelling data on context was qualitative data, which many researchers collect sparsely, if at all, when conducting randomized controlled trials.

* * *

Taken as a whole, this study suggests that multiple stakeholders will need to work in concert to attain the goals that states across the nation have set for elementary students' writing. Supporting teachers to teach to these new standards—and ensuring that students master them—will require a systemic effort. While states have attempted systemic reform for two decades, we do not yet have a coherent system that sends teachers consistent messages about instruction. Moreover, we know from prior research on the implementation of new standards that achieving the CCSS will require truly aligned student assessments, a supportive teacher development system, and local leadership with a real understanding of the work involved. Finally, this study reinforces the important role that professional development can play in helping teachers develop new understandings and make the instructional changes necessary to achieve the new standards.

Chapter 1. Introduction

Writing is an essential skill for participating in modern American society. Results of a survey of leaders from 120 large American corporations show that two-thirds of salaried employees in large companies have to write as part of their jobs. Furthermore, half of these companies consider the quality of employees' writing in decisions about hiring and promotion (College Board, 2004). As communication technologies have changed how people interact with one another, writing skills have become increasingly important. Writing skills are also known to be important to the development of reading skills and the ongoing discipline-specific learning that is required in college and many workplaces. Because writing is key to so many aspects of 21st-century life, individuals who cannot write well may have diminished opportunities for education, employment, and civic engagement.

Despite the importance of writing, assessments of student performance suggest that America's students write inadequately. A 2006 Conference Board survey of 400 employers found that, of the "basics" of reading, math, and writing, employers judged high school graduates to be most deficient in writing, with employers describing nearly three-fourths as unable to write at a basic level (as cited in Executive Office of the President Council of Economic Advisers, 2009). Confirming these findings, results from the most recent administration of the National Assessment of Educational Progress (NAEP) 2011 show only 27% of both eighth and eleventh graders are writing at or above a proficient level (National Center for Education Statistics, 2012).[5] Additionally, there are gaps in student performance related to poverty. For eighth graders, only 12% of students eligible for free or reduced-price lunch attained at least a proficient rating, compared to 37% of students who were not eligible. When fourth graders were last included in the assessment in 2002, 28% performed at or above the proficient level (Persky, Daane, & Jin, 2003). This performance

[5] Fourth graders were not included in the 2011 writing assessment.

suggests the vast majority of students are not meeting national expectations for writing beginning in the upper elementary grades.

While these results suggest an urgent need to improve student writing, policies such as the assessment provisions of the No Child Left Behind Act of 2001 (NCLB) have focused attention on student performance in reading and mathematics—sometimes at the expense of other academic areas (Center on Education Policy, 2005). In contrast, more recent policies signal the importance of writing for schools. As of January 2014, 45 states have adopted the Common Core State Standards for English Language Arts and Literacy (CCSS-ELA) and nearly all of these states have signed on with one of two national consortia developing new assessments that align to the new standards; the CCSS-ELA emphasize writing as an essential skill for success in both college and the world of work.

Implementation of the CCSS-ELA is expected to lead to changes in writing instruction. Three major changes to instruction are implicit in the CCSS-ELA: (1) a shift in the types of writing on which instruction is focused, (2) an increasing emphasis on writing in the overall instructional program, and (3) a focus on writing across the disciplines (Calkins, Ehrenworth, & Lehman, 2012; Rothman, 2011).

The CCSS-ELA identify three types and purposes of writing: (1) "arguments to support claims," drawing on "valid reasoning" and "relevant and sufficient evidence"; (2) "informative/explanatory" writing to "examine and convey complex ideas and information"; and (3) narrative writing that "develops real or imagined experiences of events" (National Governors Association, 2010, p. 18). While research and conventional wisdom suggest schools have, up until now, focused heavily on narrative writing (Cutler & Graham, 2008; Rothman, 2011), the CCSS-ELA call for an increase in both argument writing and informative/explanatory writing. This shift is due to the CCSS-ELA authors' understanding that both higher education and careers require more argument and informational writing than narrative writing (Rothman, 2011).[6] Focusing specifically on argument writing, the CCSS-ELA suggest a departure from typical persuasive writing in school, which often focuses on appealing to emotions. Instead, the CCSS-ELA require

[6] The shift also aligns with NAEP, where items are split evenly among the three types of writing at grades 4 and 8 and are weighted towards argument and informative/explanatory writing (40% of items respectively), with less emphasis on narrative writing (20% of items) by 11th grade.

students to write arguments to support claims based on a substantive analysis of text or ideas, with those claims supported by logical reasoning and appropriate evidence.[7]

Additionally, the CCSS-ELA specify that students across all grades should "write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes and audiences" (Common Core State Standards Initiative, 2010, p. 18). The importance of frequent writing is supported by the recent Institute for Education Sciences (IES) *Educator's Practice Guide* on elementary-level writing instruction, which urges teachers to spend a minimum of 1 hour a day on writing, including at least 30 minutes instructing students to learn specific writing strategies and skills (Graham et al., 2012). Implementing this change will require elevating the place of writing in curriculum and instruction (Applebee & Langer, 2011; Calkins et al., 2012).

Finally, the CCSS-ELA prescribe learning goals for both English language arts *and* literacy in history/social studies, science, and technical subjects. One implication of explicitly addressing literacy skills in other disciplines is that teachers are being asked to see writing and content area learning as integrated endeavors, where students build disciplinary and literacy skills simultaneously (Calkins et al., 2012).

To make these substantial changes in their practice, teachers will need aligned instructional policies (e.g., aligned assessments) and supports ranging from curricular materials to informed school leadership. Teachers also will need effective professional development in the teaching of writing. Prior experience with standards-based reform tells us that if teachers do not receive the supports they need, their responses to the new standards will vary and the standards will not lead to the consistent improvements they aspire to develop (Rothman, 2011).

The National Writing Project is uniquely positioned to support educators across the country in developing knowledge and skills to change their practices to align with the CCSS-ELA. Since its origins as the Bay Area Writing Project in 1974, the National Writing Project—now a national network comprising nearly 200 university-based Local Writing

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[7] The CCSS-ELA's anchor standards for writing call for students to learn to "write arguments." At the elementary grades, this type of writing is described in the CCSS as "opinion pieces." In third grade, opinion pieces are to be supported with reasons. By fourth and fifth grades, opinion pieces should be supported reasons *and* information. Throughout this report, we use the terms "argument" and "opinion" writing interchangeably.

Project sites—has been providing professional development to teachers on writing instruction. Local Writing Project sites share a common model that includes university faculty working in collaboration with K–12 expert teachers. The core principle guiding this collaboration is that expert teachers are the best teachers of other teachers. As a result, Local Writing Project sites work to develop strong teachers into teacher leaders, who can in turn plan and provide customized professional development to other teachers. This infrastructure allows the organization to quickly respond to teachers' changing demands for instructional support in writing, such as the CCSS-ELA. The Local Writing Projects also support the development of teacher professional communities focused on the goals of improving the quality of writing instruction and student writing.

SEED Professional Development and Evaluation

In March 2012, the National Writing Project was awarded a 1-year federal grant under the Title II Supporting Effective Educator Development (SEED) grant program. The National Writing Project used a portion of the SEED grant funds to provide intensive in-service to high-need elementary schools focused on CCSS-ELA implementation in third, fourth, and fifth grades.[8] As soon as the grant was awarded, the National Writing Project leadership team began refining the program and recruiting Local Writing Project sites; the sites in turn recruited school partners. In most cases, the professional development began in August 2012 and ended in May 2013.

Specifying the SEED program

The National Writing Project sought to build on Local Writing Project sites' strengths while calling for sites to adopt some common practices and approaches. In many ways, the National Writing Project developed the SEED program, including a system of supports for Local Writing Project sites, as it has developed other network initiatives. In initiatives, Local Writing Projects are selected through application or nomination processes to

[8] The SEED work initially included a focus on any college-and career-ready standards. However, all participating schools were located in states that have adopted CCSS, and so the work focused on the college- and career-ready standards adopted by the states in which participating schools were located—namely CCSS.

participate in a particular type of work and then typically receive 2 to 4 years of funding and focused technical assistance to develop, carry out, and refine programmatic approaches, as well as to disseminate that work. The National Writing Project uses initiatives as one strategy for supporting site development in emerging and complex areas of work.

In the case of SEED, the National Writing Project specified some foundational aspects of the SEED program in advance of site recruitment. Based in research and the National Writing Project's knowledge of professional development, these "nonnegotiables" outline the national office's view of the essential requirements for the SEED professional development's success:

- Sufficient depth and breadth of participation
- Joint ongoing planning and review of professional development by site and school
- A variety of professional development delivery strategies
- A focus on supporting teachers as they work to teach to the CCSS-ELA in writing, in particular in opinion/argument writing.

The nonnegotiables are discussed in greater detail in Chapter 3.

Once Local Writing Project sites were awarded grants, site and school personnel collaborated to develop individual logic models for the intensive in-service work. Based on these logic models, representatives from the Local Writing Project sites (university faculty and/or teacher leaders), schools, and the National Writing Project identified additional shared components of SEED professional development. The "common agreements" included establishing common goals and language at each school for argument/opinion/persuasive writing, focusing on teaching argument, using in-class model lessons and model texts, engaging teachers in writing, examining student writing, and engaging students' "funds of knowledge." The common agreements are discussed in greater detail in Chapter 3. Local Writing Project sites maintained their usual autonomy in determining—typically in collaboration with school-based leaders—how to put these nonnegotiables and common agreements into practice in their work with participating schools.

Evaluation design

SRI International designed an evaluation to estimate the effects of the SEED professional development on teachers' writing instruction and student argument writing, while documenting implementation of the SEED program and attending to the context in which the program was implemented. Because of the nature of the SEED funding, both the professional development and the evaluation spanned a single school year (2012–13).

The evaluation was designed as a randomized controlled trial (RCT) in which schools were assigned to either the treatment or control condition. The evaluation draws on multiple sources of data, including detailed information on the nature and frequency of, and participation in, the SEED professional development, observations of professional development, interviews with the full range of program participants and professional development providers, a teacher survey, and student writing in response to an on-demand prompt. Taken together, the data collected allowed researchers to understand the implementation of SEED professional development, the context in which it was implemented, and how it influenced teacher practice and student writing. Study methods are described in greater detail in Chapter 2 and Appendix A.

Overview of the Report

Chapter 2 presents an overview of the study methodology, including site and school recruitment processes and the resulting school sample. Chapter 3 describes program implementation across the participating schools. In Chapter 4, we turn to teacher outcomes, and in Chapter 5 we present student outcomes. Chapter 6 identifies implications for policymakers, professional development providers, and future research.

Chapter 2. Study Design and Methods

SRI International implemented a study of SEED professional development designed to: (1) describe the implementation of the professional development, and (2) estimate the impact of the professional development on third-, fourth-, and fifth-grade teachers' practices in writing instruction and on students' argument writing. The study used a randomized controlled trial (RCT) design and collected both qualitative and quantitative data on implementation.

The CCSS were completed and adopted by many states in 2010. Given the newness of the standards, professional development that is specifically aligned to the CCSS-ELA is an emerging area for all professional development providers, including for the university-based faculty and teacher-leaders at Local Writing Project sites. As a result, SRI and the National Writing Project decided to conduct the RCT as an "efficacy" study. Efficacy studies are designed to estimate the impact of a recently developed program model, as opposed to effectiveness studies that seek to estimate the general impact of an established model. Key differences between efficacy and effectiveness studies are:

- Efficacy studies provide explicit supports for implementation to ensure the program model is implemented as designed (in contrast to effectiveness studies, which assume participating sites have the capacity to successfully implement an established model of work).
- Efficacy studies do not seek to generalize estimated impacts to the entire population of sites that could potentially attempt to implement the model (again, because the study is testing an emerging model of practice rather than an established one). As a result, the sample of participating sites is selected to increase the chances of successful implementation.

To support the evaluation, the National Writing Project focused considerable attention at the outset of the program on Local Writing Project site recruitment and on supporting sites

to recruit eligible pairs of schools. As is necessary with the implementation of any new initiative, the National Writing Project also designed a system of technical assistance that would support Local Writing Project sites over the course of the year. We discuss site and school recruitment, the resulting school sample, and the National Writing Project's technical assistance for sites in the next section below. In the subsequent sections, we describe the evaluation framework and the study instruments, data collection methods, and analytic approach.

Recruitment, the School Sample, and Technical Assistance

Here, we describe the National Writing Project's process for recruiting sites and schools, including eligibility criteria and other considerations, and the resulting sample of program and control schools. Next, we describe the system the National Writing Project established to support participating Local Writing Project sites.

Site recruitment and eligibility criteria

The National Writing Project began the process of recruiting Local Writing Project sites by issuing a detailed Request for Proposals (RFP) to all National Writing Project site directors in early April 2012. At about the same time, the National Writing Project also began a more targeted effort to recruit sites that had a track record of doing intensive in-service work with elementary school teachers, with a preference for sites with experience in high-need schools. This targeted recruitment was important to ensure a sufficient number of well-qualified sites participated in the grant and recruited the number of schools necessary for the study.

All interested Local Writing Project sites were required to participate in one of three conference calls designed to provide information about the program and the evaluation. Following the initial conference calls, the National Writing Project research team scheduled calls with individual sites. The purpose of these calls was to answer questions about the SEED program and to discuss prospective school pairs. A member of the SRI research team participated in each of the conference calls and in the majority of the calls with individual sites. Formal applications, including narratives, budgets, information about the proposed

school pairs, and letters of support and commitment forms from principals, were due to the National Writing Project May 15, 2012. However, in order to increase the size of the sample and provide opportunities for additional sites to participate, the National Writing Project continued to recruit sites and accept additional applications until late June.

In all, 17 Local Writing Project sites submitted applications. National Writing Project staff immediately reviewed applications to confirm sites' eligibility and then convened a small group of network leaders who were experienced professional development providers in high-need elementary schools to review and rate applications. In reviewing applications, the National Writing Project sought to identify sites that:[9]

- Had prior experience offering intensive and sustained school-based professional development focused on writing at the elementary school level, involving multiple program activities (e.g., multiple school-year workshops or seminars, classroom demonstrations, analysis of student work, summer institutes) with preference given to sites whose in-service programs in schools last 45 hours or more per teacher;
- Had been successful working in "high-need schools" (defined as serving at least 50% of students who are from low-income families);
- Had experienced elementary school teacher-consultants[10] who are active in site work, knowledgeable about current trends in writing instruction (especially the Common Core State Standards), and available and committed to leading professional development in high-need schools throughout 2012–13;
- Were able to recruit one or two *pairs* of high-need elementary schools to participate in the evaluation;
- Were prepared to send a team to a launch meeting in summer 2012 (with the National Writing Project covering costs) and work collaboratively to design common elements of the professional development, while considering how to customize these elements to meet the specific needs of participating schools;

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9 Eligibility criteria listed here were adapted from the RFP.

10 The National Writing Project is founded on the belief that teachers are the best teachers of teachers. To this end, teachers who complete local Invitational Summer Institutes are considered teacher-consultants. Many of these teacher-consultants obtain additional professional development at their sites to prepare them to mentor other teachers in teaching writing.

- Were committed to participating in the independent evaluation;
- Had stable site leadership; and
- Were members of the National Writing Project network in good standing (e.g., were up to date with reporting requirements).

Ultimately, 15 sites were invited to participate. Some attrition occurred before the evaluation began, as one school decided not to participate causing the Local Writing Project site to withdraw. The 14 Local Writing Project sites in the original sample are located in 13 different states; all 13 states had adopted the CCSS.[11]

Participating Local Writing Project sites received $20,000 per partner school. Universities were allowed to spend up to 10% of these funds on indirect/overhead expenses.

School eligibility criteria and recruitment

To apply for SEED funding, Local Writing Project sites needed to recruit pairs of schools so one school in each pair could be randomly assigned to the program and the other would serve as the control. To be eligible, schools were required to meet the following criteria:[12]

- Be a high-poverty school, defined as a school in which at least 50% of students are from low-income families.[13]
- Include grades 3, 4, and 5.
- Be willing and able to provide resources to support the in-service work and classroom implementation (e.g., additional funds, professional development time,

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11 While all states had adopted the CCSS, some states' commitment to the new standards wavered over the course of the program. For example, both Alabama and Oklahoma withdrew from the CCSS-aligned assessment consortia in 2013.

12 Eligibility criteria are adapted from a recruitment brochure that National Writing Project staff prepared for school leaders.

13 This threshold is met when at least 50% of students are eligible for free or reduced-price lunches under the Richard B. Russell National School Lunch Act or at least 50% of students are from low-income families as determined by using one of the criteria specified under section 113(a)(5) of the Elementary and Secondary Education Act of 1965, as amended.

paid substitutes to allow teachers to participate in professional development, protected classroom time for writing instruction).

- Be willing to participate fully in the evaluation, including being willing to be assigned to the control condition.

In addition, the National Writing Project sought to balance the typical circumstances of intensive in-service work with the requirements of an RCT. As such, the National Writing Project urged sites to recruit schools that had some previous experience with or knowledge of their Local Writing Project site. The National Writing Project identified at least some level of prior relationships between schools and sites as a typical precondition for intensive, schoolwide professional development; a prior relationship is important because the two parties begin their work together with at least a basic understanding of the needs and capacities of the other—facilitating planning and effective communication. At the same time, in order to ensure schools could serve in the control condition, Local Writing Project sites were directed to recruit schools with no more than one or two teachers who had participated in the site's Invitational Summer Institute (ISI) and where the school faculty as a whole did not receive more than 10 hours of Writing Project professional development in the 2 years prior.

Because the schools were to be randomly assigned as either a program or control school, the National Writing Project and SRI counseled sites to recruit school pairs that were as closely matched as possible. Proposed pairs were to be similar on each of the following dimensions:

- Prior average achievement in writing or other English language arts assessments
- Demographics of students served, especially proportion of low-income students
- Level of prior involvement with their Local Writing Project site

If possible, the schools were to be in the same school district, serve the same grades, be roughly the same size, and have similar reputations.

School leaders were informed that, if selected for the program, the school would need to commit to:[14]

- Making it possible for all third-, fourth-, and fifth-grade teachers to participate in 45 hours or more of writing professional development in 2012–13 (e.g., release time, professional development time, substitutes, additional funds to cover the full cost of services provided);
- Making college- and career-ready writing an explicit focus of the school's efforts;
- Establishing curricular and instructional policies that support college- and career-ready writing (e.g., dedicate instructional time to writing, modify curricular programs at odds with the professional development, purchase resources to help teachers carry out work in their classrooms);
- Supporting teachers as they try out new ideas and strategies in their classrooms;
- Engaging key district and school leaders and teachers in supporting the Local Writing Project site's professional development;
- Identifying, in collaboration with the Local Writing Project site, an individual liaison to work with the site, participating in the summer launch meeting, additional planning, and supporting the professional development work during the 2012–13 school year; and
- Participating fully in the evaluation activities.

The control condition was designed to represent "business as usual"—that is, the experience program schools would have had in terms of professional development in writing instruction during the 2012–13 school year if SEED had not existed. School leaders were informed that, if randomly assigned to the control condition, their school would receive a $3,000 stipend in exchange for delaying participation in professional development focused on writing or the CCSS-ELA standards for the 2012–13 school year, except for professional development required by the district or the state. Additionally,

[14] The list of commitments that schools were asked to make is taken from the National Writing Project's recruitment brochure designed for school leaders.

pending availability of funding from the National Writing Project, schools would be eligible to participate in the SEED program during the 2013–14 school year.[15]

The 14 Local Writing Project sites in the original sample recruited 22 pairs of schools. Seven sites recruited one pair each; six recruited two pairs; and one recruited three pairs.[16] In June 2012, SRI randomly assigned the 44 proposed schools to either the program or control condition. Schools were informed of their assignment by mid-June, and SRI researchers scheduled calls with each of the school principals to confirm their willingness to accept the assignment (to program or control), to review the requirements of the evaluation and the plan for data collection, and to address any questions. All 44 school principals agreed to the terms and accepted their assigned condition. In January 2013, one site and school pair dropped from the program and study, when the program school chose to withdraw due to demands of new district mandates.

Characteristics of participating schools

The final sample for the evaluation included 13 Local Writing Project sites and 21 pairs of schools. Here, we present demographic and school performance data for the program and control school samples.

SRI drew on publicly available school-level data to compare basic demographic and achievement characteristics between program and control schools in the SEED evaluation. These included data on enrollment, poverty, English language learner status, and proficiency on state English language arts and reading tests in the grades targeted by the SEED professional development.

Program and control schools had similar total enrollment, percent of students eligible for free or reduced-priced lunches, and percent of students classified by their states as English language learners (Exhibit 2-1). As would be expected given the SEED eligibility

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15 In 2013–14, Local Writing Project sites are working with 20 schools.

16 Originally, the National Writing Project asked sites to recruit one or two pairs of schools. One site generated substantial interest in the work and was able to recruit three pairs of schools; the National Writing Project staff allowed all three pairs to participate because the site had particularly high capacity for the work (i.e., a large pool of teacher-consultants, experience with intensive school-based professional development, and experience with research and evaluation).

requirement that schools be high poverty, on average 75% of students in schools qualified for free or reduced-priced lunches.

Exhibit 2-1
Mean school-level demographic characteristics

	Program	Control
Total enrollment	472 (160) *n* = 21	530 (207) *n* = 21
Percent of students eligible for free or reduced-priced lunch	73% (0.18) *n* = 20	75% (0.15) *n* = 20
Percent of students classified as English language learners or limited English proficient	23% (0.15) *n* = 9	22% (0.12) *n* = 8

Note: These calculations exclude certain schools for which data could not obtained from the state department of education websites. Enrollment data was available for all 42 schools. There was one program and one control school for which no data on the number of students eligible for free or reduced-priced lunch could be obtained. There were also 25 schools for which no information on the number of students classified as English language learners.

Source: Publicly available data accessed from state education department websites in February 2014.

Data on percentage of students proficient or above on state English language arts or reading tests was also examined (Exhibit 2-2). Although individual state tests differ in content and cut point, the proficiency percentage provides an indication of the level of achievement and accountability pressure a school may face due to low state test scores. The mean percentage of students scoring proficient or above appears similar across program and control schools, across all grades.

Exhibit 2-2
Mean school-level percentage of students scoring proficient or above on state standardized English language arts or reading tests

	Program	Control
Grade 3	55% (0.21) *n* = 21	61% (0.19) *n* = 21
Grade 4	61% (0.20) *n* = 21	64% (0.20) *n* = 21
Grade 5	61% (0.17) *n* = 21	57% (0.21) *n* = 21

Source: Publicly available data accessed from state education department websites in February 2014. Assessments and proficiency thresholds are different in every state. Within each state the number of program and control schools was the same.

We also examined baseline data on teacher and student outcome measures and confirmed that randomization led to the expected equivalence across the program and control samples. (See Gallagher, Woodworth, and Park, 2012, for baseline teacher outcome data and Appendix B for baseline data on student writing performance. Exhibit 5-1 also presents a summary of student writing performance at baseline.)

Technical assistance

The National Writing Project supported Local Writing Project sites through ongoing technical assistance that included face-to-face meetings for site and school participants, "thinking partners" who provided tailored support and feedback to site leaders, regular conference calls for site leaders, an online forum, and ongoing budget monitoring. We describe each of these models of technical assistance here:

- *In-person, whole group meetings.* Face-to-face meetings included a 2½-day launch retreat in late July/early August 2012 and a 1½-day reunion in mid-November 2012 that coincided with the National Writing Project's annual meeting. The launch meeting included sessions on introducing the CCSS, teaching opinion writing, and using mentor texts, among others. Both National Writing Project staff and Local Writing Project site leaders led these sessions. Importantly, the launch meeting also

included a full day for site and school leaders to learn about and develop a logic model for their work, and another half day to identify "common agreements"—based on their logic models—to guide the SEED professional development across sites. The November 2012 meeting included (1) a series of workshops that participants could choose from, ranging from presentations of rollout and delivery strategies for professional development to demonstrations of lessons designed to teach argument/opinion writing; and (2) an all-day working meeting that included a presentation on professional development delivery; a demonstration lesson; time for sites to work in small groups and share challenges and offer solutions; and time for small groups to come together to talk and learn about particular topics (e.g., mentor texts for teaching argument, writing argument prompts, and more).[17]

- *Thinking partners.* The National Writing Project assigned thinking partners to each participating Local Writing Project site to support and help think through challenges around the implementation of the professional development. The thinking partners were a team of four National Writing Project staff members and two Local Writing Project site directors with experience leading intensive professional development in elementary schools. The thinking partners' work with sites took the form of monthly one-on-one calls with site leaders and, in many cases, site visits. To support their work with sites, the thinking partners convened as a group via monthly phone calls and an online forum where they posted notes and shared concerns. The thinking partners also worked together to plan the face-to-face meetings and bimonthly conference calls with site leaders.

- *Conference calls.* The National Writing Project hosted bimonthly conference calls in which Local Writing Project sites shared successes and challenges, and selected sites presented on some aspect of their work (identified in advance in consultation with National Writing Project staff).

- *Online forum.* The SEED online community allowed site leaders to post their work (e.g., professional development plans, logic models) to enable other program

[17] The National Writing Project paid for travel expenses for up to three people to attend the summer launch and two people to attend the November check-in.

participants to view and respond to it. The online community also served as a portal for thinking partners to access the artifacts and leave comments.

- *Budget monitoring.* National Writing Project staff took advantage of their responsibility to monitor site budgets to examine the use of program funds as a basic means of ensuring the sites were allocating sufficient resources to professional development (i.e., they were spending at a rate that would ensure they made use of all of their grant funds within the year).

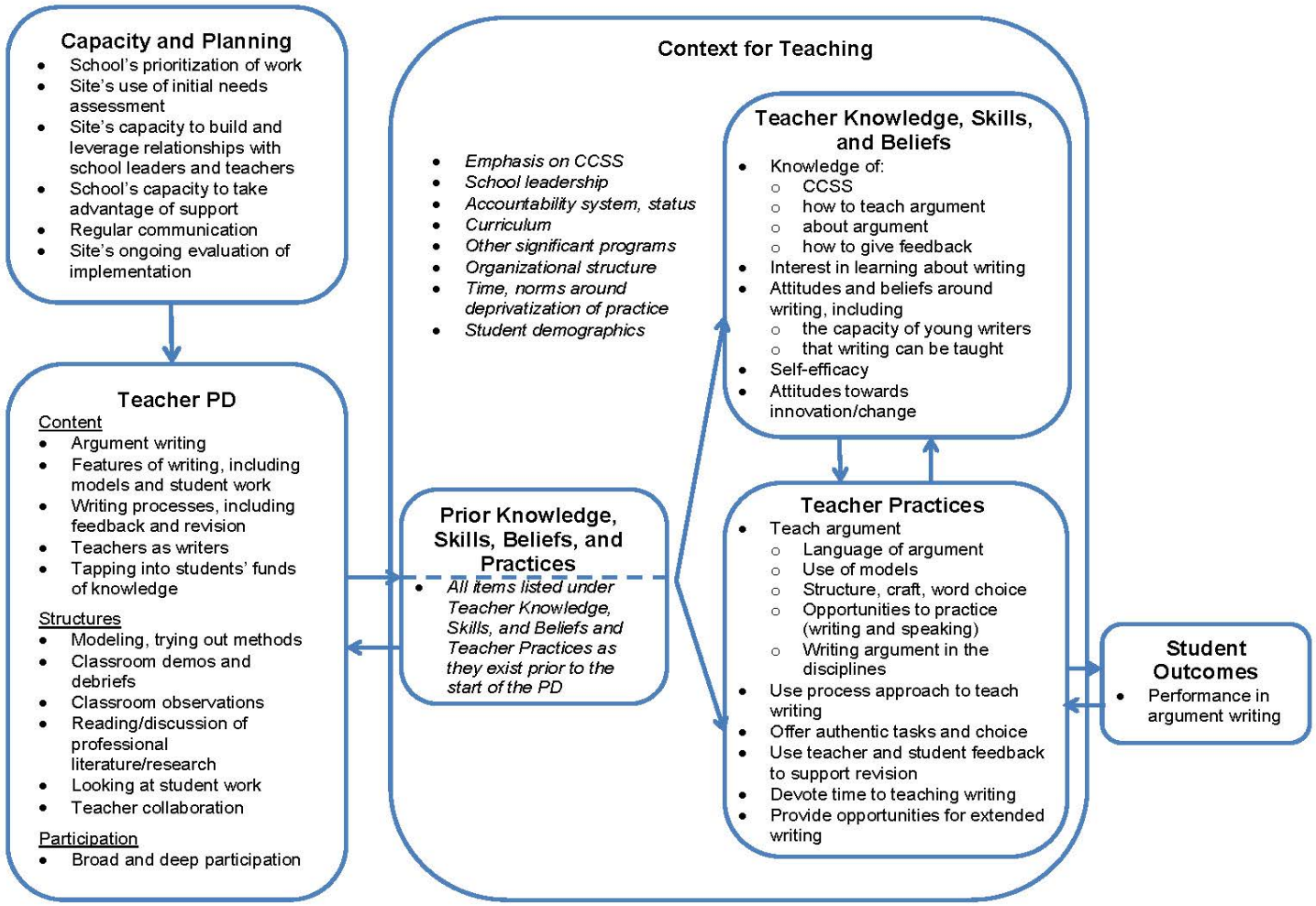
The recruitment and support processes described above were designed to facilitate sites' implementation of the SEED program, retaining fidelity to program features specified in the nonnegotiables and common agreements while responding to the varied needs of individual schools and local contexts.

Evaluation Framework

The structure of the National Writing Project, as a network of university-based Local Writing Project sites, provides flexibility for local sites to tailor professional development to meet the needs of local teachers. However, the Local Writing Project sites participating in the SEED program shared a professional development model based on "nonnegotiables" (identified in advance by the National Writing Project) and "common agreements" (developed collaboratively by participating sites and schools). Seeking to make explicit the key components of this shared model as well as the expected teacher and student outcomes, members of the SRI research team and National Writing Project staff together formalized the framework for the SEED evaluation (Exhibit 2-3).

In addition to specifying the key components of SEED professional development, the evaluation framework identified dimensions of school and site capacity and joint planning that were expected to influence the SEED professional development. The framework also explicitly anticipated the important role that contextual factors play in shaping teachers' existing knowledge, skills, beliefs, and practice, *and* their response to the professional development. These contextual factors include existing curricula, accountability policies and pressures, school leadership, and the extent of focus on the CCSS, among others.

Exhibit 2-3. Evaluation framework



Drawing on the National Writing Project staff's vision for the SEED program as well as the recent IES *Educator's Practice Guide* on elementary-level writing instruction (Graham et al., 2012), the evaluation framework detailed the teacher knowledge, skills, beliefs, and practices expected to increase as a result of the SEED professional development. Finally, the evaluation framework connected these changes in teacher practice to improved student performance in argument writing.

Data Collection Instruments and Procedures

Randomized controlled trials require comparable measurement of implementation and outcomes in the treatment and control conditions in order to ascertain the extent to which the treatment condition (i.e., participating in the SEED program) was different from the control condition, and to measure the difference in outcomes. To estimate the impact of SEED professional development, SRI used teacher surveys and on-demand student writing prompts to measure differences in teacher practices and student writing at baseline (fall 2012) and near the end of the school year of SEED professional development (spring 2013). The teacher survey, together with records of professional development attendance (known as professional development monitoring forms) and interviews conducted by SRI researchers, measured program implementation and shed light on contextual factors that supported and hindered Local Writing Project sites in implementing their SEED professional development programs and teachers in responding to the professional development. Exhibit 2-4 provides a crosswalk between the evaluation framework elements described above and the data sources.

Exhibit 2-4
Data sources for evaluation framework elements

	On-demand writing prompt	Teacher Survey	Interviews and site/school visits	Professional development monitoring forms
Capacity and planning			✓	
Teacher professional development		✓	✓	✓
Context for teaching			✓	
Prior teacher knowledge, skills, and beliefs		✓	✓	
Teacher knowledge, skills, and beliefs		✓	✓	
Teacher practices		✓	✓	
Student outcomes	✓			

To facilitate administration of student on-demand writing prompts and teacher surveys, SRI established a system that relied on local staff to help support data collection activities. Below, we briefly describe this system—specifically, the role of the local site research coordinator—and then describe each data source and the procedures for collecting that data. See Appendix A for more detailed information on research methods.

Local site research coordinator

SRI asked Local Writing Project sites to identify someone in their area who could support data collection for the SEED study. SRI trained these Local Site Research Coordinators (LSRCs) on appropriate procedures for data collection and maintaining a firewall between the study and SEED professional development. Specifically, the LSRCs were prohibited from planning, participating in, or presenting any professional development to teachers in the program schools, and Local Writing Project staff affiliated with the SEED program were prohibited from participating in data collection. LSRCs received a stipend of $2,000 to $4,000 based on the number of schools they served.

On-demand writing prompt

The ultimate goal of the SEED professional development is to improve student writing—specifically in the area of argument writing. To measure the impact of SEED professional

development on writing performance, SRI administered on-demand writing prompts to third-, fourth-, and fifth-grade students across all program and control schools in fall 2012 and spring 2013.

SRI chose four pairs of prompts from a selection of six pairs developed by the National Writing Project for this evaluation. Students responded to one prompt in a pair in fall 2012 and the other prompt in that pair in spring 2013. Each prompt within a pair had a similar form, but differed in specific topic, to allow for comparability from fall to spring. All prompts required students to write for the purpose of presenting an opinion and were of similar length (82 to 112 words). The National Writing Project pilot tested each of these prompts with third-, fourth-, and fifth-grade students to assess student understanding, interest, writing quality, and response length.

SRI fielded writing prompts to all third-, fourth-, and fifth-grade students in eligible classrooms. A teacher's classroom was deemed eligible as long as it did not have over 50% students with special needs.[18] In situations where teachers were departmentalized by subject (e.g., two fifth-grade teachers teach reading and writing for the whole grade, while two other fifth-grade teachers teach mathematics and science), prompts were administered in homeroom classes and so may not have been administered by students' writing teachers.[19]

Prior research shows that structure, wording, and presentation of prompts can affect student responses in ways that are not easily predicted (Huot, 1990; Quellmalz, Capell, & Chou, 1982). To mitigate the possibility that student performance may reflect characteristics of the prompt rather than student writing ability, SRI counterbalanced prompts for fall and spring administration. In other words, all four prompt pairs were administered within classrooms in both fall and spring; which prompt in each pair was administered in fall or spring alternated across classrooms.

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[18] SRI sought to collect data from all third-, fourth-, and fifth-grade students; however, to facilitate data collection, SRI targeted intact classrooms of students for administration.

[19] An exception was made to this procedure for schools in one district where, in grades four and five, only the English language arts teachers were targeted for the SEED professional development. At these school sites, prompts were administered to all students in their English language arts classes. At all other schools, the SEED professional development targeted all third-, fourth-, and fifth-grade teachers regardless of whether teachers were departmentalized by subject.

In fall 2012, teachers in all 44 program and control schools administered prompts; in spring 2013, teachers in the 42 program and control schools remaining in the study administered prompts. To support teachers in the administration of the prompts, LSRCs met with all teachers prior to fielding the prompts, scheduled dates for administration, and were present at schools sites on the day of administration.

Following the administration of spring prompts, SRI selected a random sample of 10 pairs of student responses from each class for scoring.[20] The final sample included 3,835 students (for a total of 7,670 total papers) from 397 teachers in 42 schools. In summer 2013, student responses to the prompts were scored using the National Writing Project's Analytic Writing Continuum (AWC) Assessment System (National Writing Project, n.d.).

Teacher survey

SRI administered surveys to third-, fourth-, and fifth-grade teachers across program and control schools in fall 2012 and spring 2013. Teachers eligible for the survey included all third-, fourth-, and fifth-grade classroom teachers.[21]

The fall survey collected baseline information on teachers' knowledge, beliefs, and attitudes related to writing instruction and on teachers' instructional practices in writing and asked about prior professional development in writing.[22] The spring survey asked again about teachers' knowledge, skills, and beliefs related to writing instruction and about instructional practices in writing during the 2012–13 school year in order to examine program impacts on teacher outcomes. In addition, the surveys included questions about

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20 Our final sample included eight or more prompt pairs from over 98% of teachers and a full set of 10 pairs from over 91% of teachers. The most common reasons for sampling fewer than 10 prompt pairs per teacher were students writing in a language other than English and student turnover.

21 Again, an exception was made for schools in one district where, in grades four and five, instruction is departmentalized and only the English language arts teachers were targeted for the SEED professional development. At these schools and in these grades, surveys were administered to English language arts teachers only.

22 For teachers who had not taught before or who taught in a very different context the prior school year, responses to these questions may not provide an appropriate measure of baseline instructional practice at the schools. As a result, for the purpose of this analysis, SRI researchers excluded the following teachers: first-year teachers; teachers who taught in a different school district; teachers who taught in the same school district, but at a different school serving a different student population (e.g., student characteristics, grade levels served); teachers who taught outside of the adjacent two grade levels of their current teaching assignment; and teachers who taught kindergarten or first grade.

teachers' experiences with writing professional development over the course of the 2012–13 school year.

To develop the survey instrument, SRI researchers identified key constructs in the evaluation framework and drafted aligned survey items and, where appropriate and available, adapted survey items from existing survey instruments.[23] National Writing Project staff had opportunities to review multiple drafts of the survey for content and to help establish priorities. The teacher survey was pilot tested with upper elementary grade teachers for readability, understanding, and length. Researchers adjusted survey items based on pilot teacher feedback. The survey was administered online. Each teacher received a unique survey link, which allowed analysts to track response rates, follow up with nonrespondents, and link fall and spring surveys.

The teacher outcomes are based on responses to the spring survey. To be eligible for inclusion in the analytic sample, teachers needed to be at the school for the majority of the school year so they had a reasonable opportunity to participate in a substantial amount of professional development. Teachers who were not at the school towards the end of the school year were automatically excluded from the teacher outcomes analysis, as they did not complete a spring survey. In addition, five respondents to the spring survey who started teaching at a program or control school after November 1, 2012, were excluded from the analysis. Exhibit 2-5 shows the number of eligible teachers surveyed and the number and percentage of respondents from both program and control schools. All of the survey data presented in the rest of the report is restricted to the analytic sample.

[23] In developing the survey, the SRI team drew on surveys created for a previous SRI evaluation of Writing Project professional development (National Evaluation of Writing Project School Partnerships), surveys of elementary writing instruction developed by Steve Graham, and the Consortium for Chicago School Research 2011 Teacher Survey.

Exhibit 2-5
Teacher survey analytic sample

	Program	Control
Eligible teachers who were surveyed in spring	170	203
Spring survey respondents, final spring analytic sample	150 (88%)	176 (87%)

Professional development monitoring

To systematically gather data on the frequency, format, and content focus of SEED professional development, and to track teacher participation in these events, SRI collected data directly from each Local Writing Project site through professional development monitoring (PDM) forms. Because this data collection effort was focused on the SEED program, no comparable data were collected for control schools. PDM forms captured the SEED professional development from the site point of view, allowed the research team to gain a deeper understanding of professional development for each program school, and served to triangulate the data gathered through interviews and the various quantitative data sources.

SRI gathered these documents at the end of summer 2012 and then at the end of each semester during the school year. All Local Writing Project sites submitted these forms, for a 100% response rate.

Interviews and site visits

Through interviews and observations, researchers gained insight into school and site capacity, the nature of the planning process, context for teaching, teachers' and teacher-consultants' experiences with writing professional development and writing in general, and perceived changes in teachers' practice and students' writing. Interviews and observations also provided researchers with insights into teacher, administrator, and professional development instructor beliefs and understandings of writing instruction and the professional development overall.

In fall 2012, SRI researchers conducted phone interviews with Local Writing Project leaders and/or teacher-consultants in all 14 participating sites and with one to two school

leaders in 21 of the 22 program schools. These interviews focused on site and school capacity, the nature of the planning process, school context for teaching, baseline teacher practices in writing, professional development that had been provided to date, and plans for future professional development.

During winter and spring 2013, SRI researchers visited all sites and program schools that remained in the study. These site visits included observations of SEED professional development whenever possible. During the visits, researchers interviewed Local Writing Project site leaders and teacher-consultants, school administrators and school-based professional development leaders (e.g., literacy coaches), and participating third- through fifth-grade teachers. Interview content was similar to that of the fall interviews but focused more on perceptions of the SEED professional development and changes in teacher knowledge, skills, beliefs, and practices.

In addition to conducting interviews at program schools and the Local Writing Project sites, control school principals were interviewed by phone in order to understand contextual issues that might affect the contrast with the partnership schools. For example, significant state-mandated professional development on writing instruction under the CCSS-ELA would have maintained with the requirements of the "business as usual" control condition but still could have influenced students' writing scores.

In total, the SRI research team conducted 187 interviews with teachers and administrators at program schools and 45 interviews with professional development providers at the Local Writing Project sites. The team also conducted eight observations of SEED professional development events and interviewed an administrator at 18 of the 21 control schools.

Chapter 3. Program Implementation

The National Writing Project conceived of the SEED program as a means to support elementary school teachers making the transition to the CCSS in writing. However, teachers are not alone in making this shift, as Local Writing Project sites also are aligning their work to address the challenges of the new standards. In order to support the Local Writing Project sites and meet the demands of a randomized controlled trial design that calls for clearly distinguishable differences between program and control school teachers' experiences with writing professional development, the National Writing Project created nonnegotiables and common agreements to guide the SEED work. This chapter explores the implementation of SEED professional development, with a focus on how it aligned with these design principles.

SEED Design Principles

The National Writing Project identified five nonnegotiable features of the SEED professional development. These included:

- At least 45 hours of professional development per teacher;
- Participation of at least 75% of third-, fourth-, and fifth-grade teachers;
- Ongoing planning and review of professional development and implementation between the school and Local Writing Project site;
- At least three modes (e.g., workshop, model lesson, book study) of professional development; and
- Support for teachers in offering instruction that will enable students to develop and demonstrate grade-level appropriate competency in Common Core State Standards in writing, with an emphasis on informational and opinion/argument writing.

Participating sites and schools later established common agreements that further defined the SEED professional development program as including the following features:

- A launch or opening session that establishes goals and common language for argument/opinion/persuasive writing
- A focus on the teaching of argument, including the concept of claims and supporting evidence, though specific terminology may vary by site
- In-class model lessons with students and teachers, demonstrating strategies that focus on argument and qualities of effective writing (e.g., crafting claims, citing appropriate evidence, structuring effective sentences and paragraphs, using appropriate conventions, writing strong conclusions)
- The use of nonfiction texts as models for arguments and/or engaging informational writing
- Teachers writing arguments themselves in order to reflect on their experience and inform their instruction
- Examination of student writing in order to follow student progress and refine instruction
- Engaging students' funds of knowledge and cultural and linguistic diversity as a means of improving student writing and exploring social justice issues

Together, the nonnegotiables and common agreements established the program design principles, with the expectation that sites would build upon these principles by bringing in their existing best practices and adapting them to local needs. More specifically, the nonnegotiables established baseline participation rates, the need for joint, on-going planning and review of the professional development, and basic parameters for the how and what of the professional development. The common agreements narrowed the focus by spotlighting the importance of argument writing and establishing specific means for achieving the projects' goals.

To examine implementation of SEED professional development, this chapter draws on Local Writing Project sites' reports (i.e., professional development monitoring, or PDM, forms), spring teacher survey data, and interviews with teachers and administrators in program schools. PDM forms called for information on the content, frequency, and duration of SEED professional development, and documentation of the contact hours of participating teachers. More specifically, the PDM forms asked Local Writing Project sites to list each professional development activity conducted with their program school(s), and to list each

event's primary focus (e.g., strategies for analyzing student work), format (e.g., coaching, workshop), and length of the event. In addition, the PDM asked sites to write about each event's goals, activities (including any online components), materials, and any preparation participants were required to do as part of each event. The spring teacher survey included a module of items about teachers' experiences with writing professional development during the 2012–13. Because the survey was administered to teachers in both program and control schools, the survey allows for comparisons between the program school teachers' experiences and the control school teachers' experiences. Finally, the research team used interviews to obtain more nuanced information about SEED professional development as teachers experienced it.

With a focus on examining SEED professional development against the SEED design principles, this chapter begins with an overview of the breadth and depth of teacher participation. Next, it describes the modes Local Writing Project sites used to provide SEED professional development, followed by a look at the content focus of the professional development. It then turns to a discussion of the co-planning that Local Writing Project sites and participating schools engaged in, with the goal of designing professional development that met both program goals and local needs. Next, it departs from the SEED design principles and explores the influence of some common Writing Project practices on the SEED work. Finally, the chapter concludes with a discussion of teachers' experiences with the SEED professional development.

Teacher Participation in Professional Development

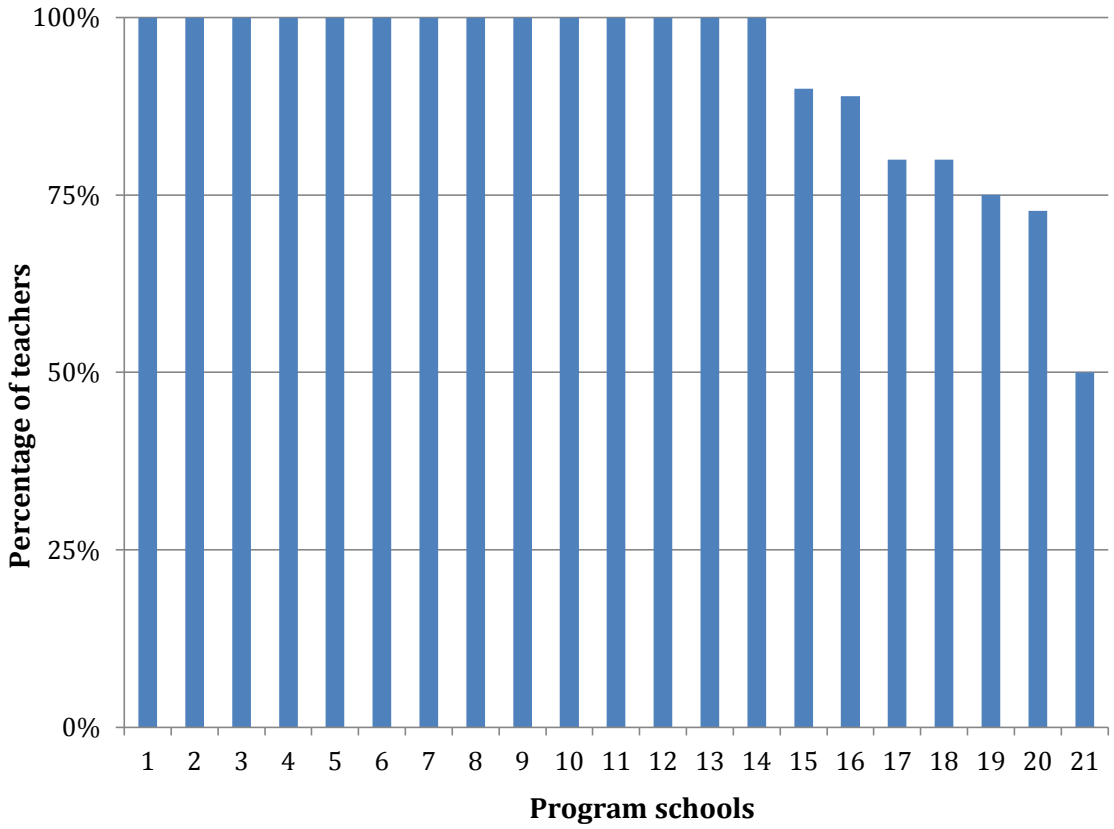
The first two nonnegotiables address the need for program teachers to collectively participate in a substantial amount of professional development to support shifts in their practice. More specifically, the nonnegotiables state that 75% of third- through fifth-grade teachers must participate in 45 hours or more of SEED professional development.

Across program schools, high percentages of teachers participated in a substantial amount of SEED professional development.

In keeping with SEED's design principles, many teachers participated in considerable amounts of SEED professional development. At 12 of the 21 program schools, at least 75% of teachers participated in at least 45 hours of SEED professional development. When the threshold is lowered to 40 or more hours, 19 schools achieved teacher participation rates

of 75% or more (Exhibit 3-1). At the 40-hour threshold, only one school missed the 75% participation target by a substantial margin.

Exhibit 3-1. Teachers' rates of participation in 40 or more hours of professional development, by SEED program school



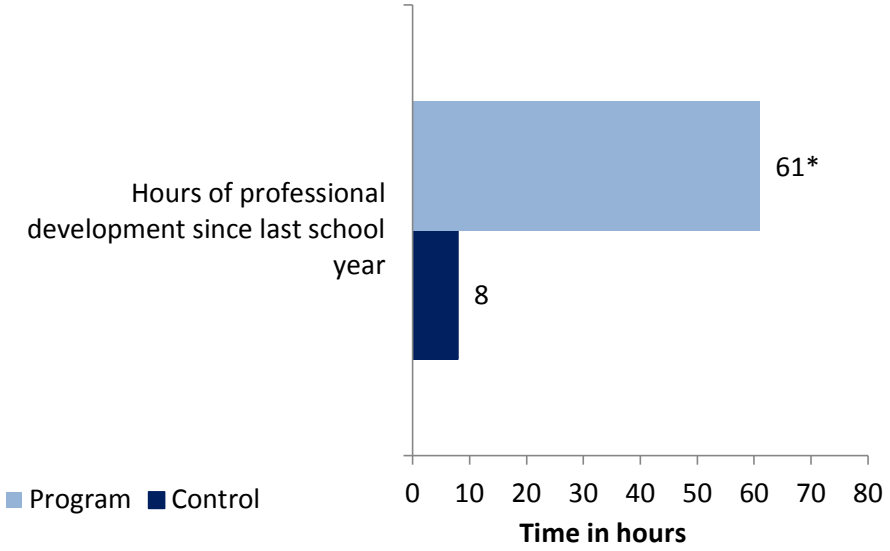
Source: Professional development monitoring.

Program school teachers' hours of participation in writing professional development far exceeded control school teachers' participation in writing professional development.

As would be expected, given SEED's emphasis on writing professional development, when asked on the survey how many hours they had spent in writing professional development, program school teachers reported participating in far more hours than teachers in control

schools (Exhibit 3-2). Reported hours of professional development included any type of writing professional development, including that required by districts and states.[24]

Exhibit 3-2. Teachers' reports of hours of participation in writing professional development since the end of the last school year (including summer 2012)



*Note: * denotes a statistically significant difference (*p < *.05) between program and control groups.*
Source: SEED teacher surveys.

All teachers in both program and control schools who participated in at least some (1 hour or more) writing professional development were asked to respond to additional survey questions regarding the nature of the writing professional development they participated in. Teachers' responses to these survey questions are reported in the subsequent sections. A total 99% of the teachers in the program schools and 56% of the teachers in the control schools reported participating in at least 1 hour of writing professional development.

[24] The control condition of the evaluation was designed as a "business as usual" condition. Because many states and districts were in the early stages of adopting the CCSS-ELA, they required some amount of participation in professional development on the CCSS-ELA among teachers in control schools. The study allows for this and considers participation in district- or state-required writing professional development compliant.

Strategies Employed in the Professional Development

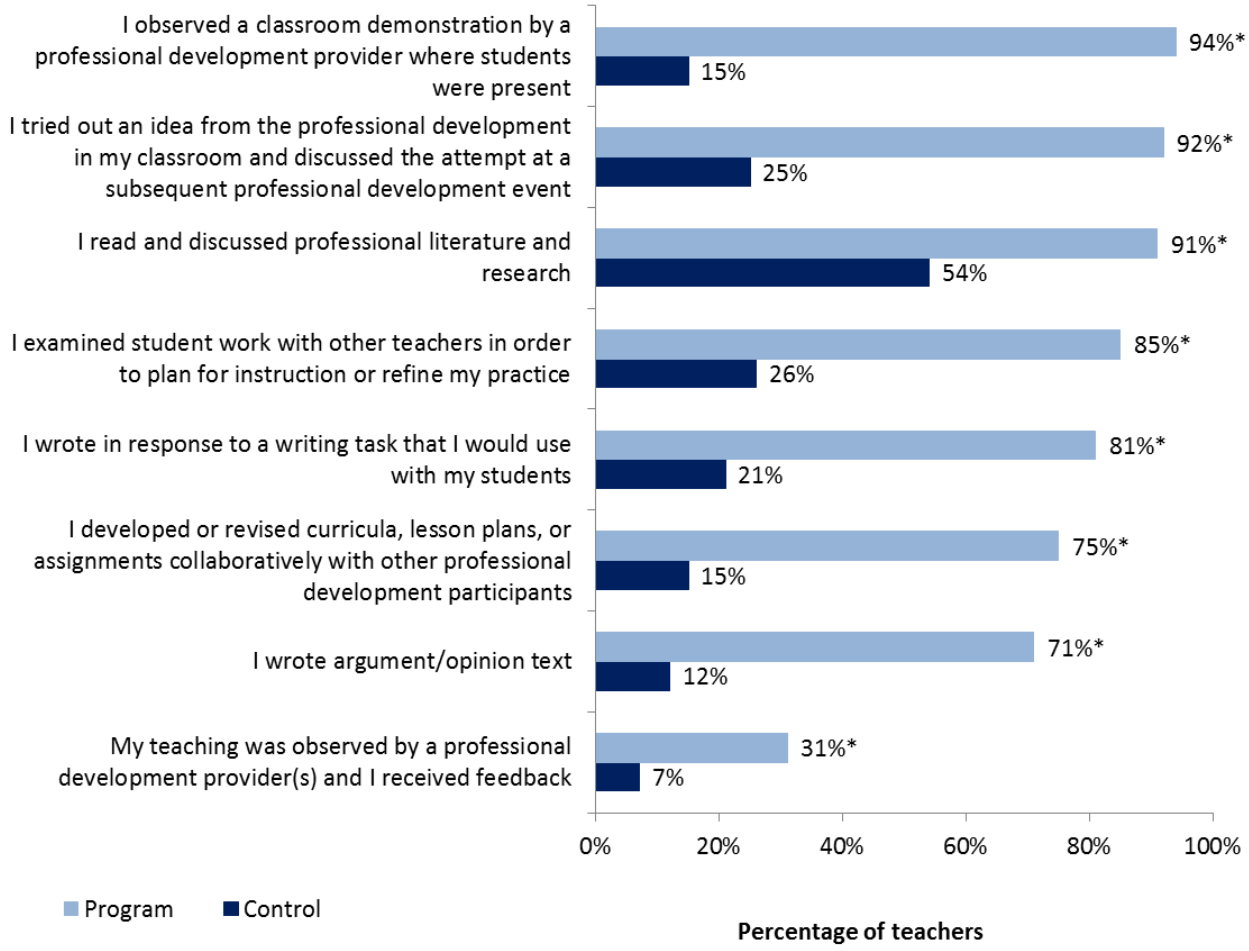
Engaging teachers in multiple modes of professional development can facilitate their learning by allowing them different avenues for engaging in new ideas and ways of teaching. While the nonnegotiables highlight the importance of offering multiple experiences by requiring at least three different modes of delivery, the common agreements called out specific modes, such as in-class model lessons and teachers writing argument/opinion text themselves. Consistent with these design principles, SEED professional development engaged teachers in a wide variety of professional development strategies.

Local Writing Project sites used many modes of professional development when working with teachers in SEED program schools.

Program school teachers reported engaging in a variety of modes of writing professional development to a far greater extent than did teachers in control schools (Exhibit 3-3). Specifically, the survey asked teachers who had reported participating in at least 1 hours of writing professional development to mark all modes of writing professional development they had participated in. Prevalent practices brought professional development to teachers' classrooms, engaged participants in collaborative work, and engaged teachers in writing themselves.

Over the course of the school year, within any Local Writing Project site, teachers engaged in a variety of professional development strategies. The professional development at one site exemplified the range of strategies. At this site, teachers spent time deconstructing the CCSS, reading professional articles about writing, looking at student work, observing a teacher-consultant modeling lessons for them in professional development workshops and in their classrooms, and finally trying out new activities in their own classes and debriefing these classroom experiences as a group at a subsequent professional development session.

Exhibit 3-3. Frequency with which teachers identified the use of various professional development strategies, among those who participated in writing professional development



*Note: * denotes a statistically significant difference (*p < *.05) between program and control groups.*
Source: SEED teacher surveys.

Focus of the Professional Development—Alignment with SEED Design Principles

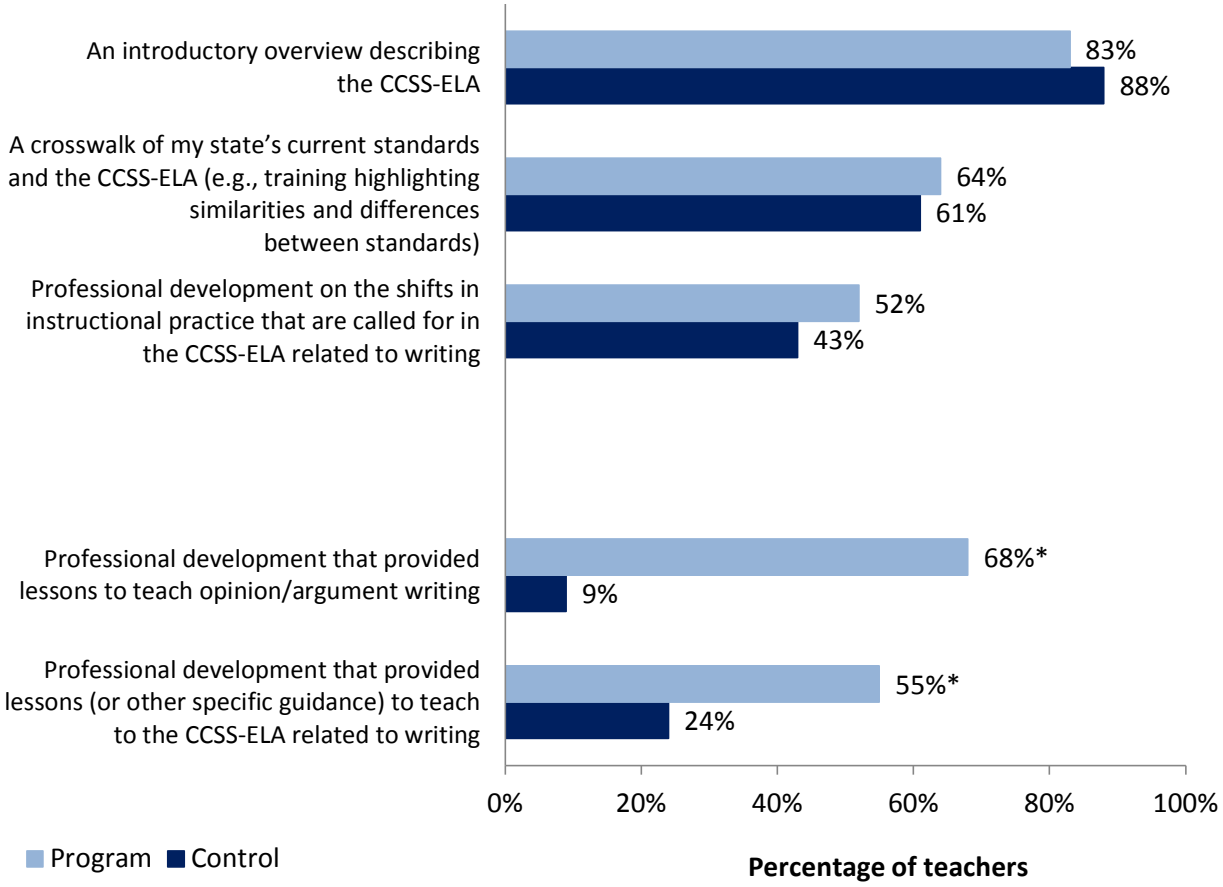
As described above, the nonnegotiables call for professional development in support of the CCSS-ELA in writing, while the common agreements put a spotlight on argument writing more specifically. The common agreements further stress the use of models, teachers writing arguments themselves, and engaging students' funds of knowledge to support

effective instruction on argument writing. This section examines the presence of these attributes in SEED professional development.

While teachers at both program and control schools participated in introductory professional development on the CCSS-ELA, the SEED professional development included more guidance on teaching argument writing and teaching to the CCSS-ELA related to writing.

To better understand what kinds of professional development the CCSS-ELA program and control teachers participated in, the survey asked teachers who had participated in professional development relating to the CCSS-ELA to describe the professional development by marking any number of a series of descriptors of the professional development. Analysis of these responses indicates that teachers in program and control schools who participated in professional development relating to the CCSS-ELA reported similar rates of participation in introductory professional development on the CCSS-ELA (Exhibit 3-4). This introductory professional development included an overview of the CCSS-ELA, a crosswalk of state standards and the CCSS-ELA, and a presentation of the shifts in instructional practices called for by the CCSS-ELA. Teachers at program schools, however, were much more likely than teachers in control schools to report a focus on in-depth work to support teaching to the CCSS-ELA. Consistent with the nonnegotiables and common agreements, more than two-thirds of teachers in program schools reported that professional development that provided lessons to teach opinion/argument writing were a focus of professional development, in comparison with 9% of teachers in control schools. When asked about professional development that provided lessons to teach to the CCSS-ELA related to writing, more than half of program teachers who participated in professional development relating to the CCSS-ELA reported this focus while only about a quarter of control teachers did.

Exhibit 3-4. Frequency with which teachers identified CCSS-ELA foci of professional development, among those who participated in professional development on the CCSS-ELA



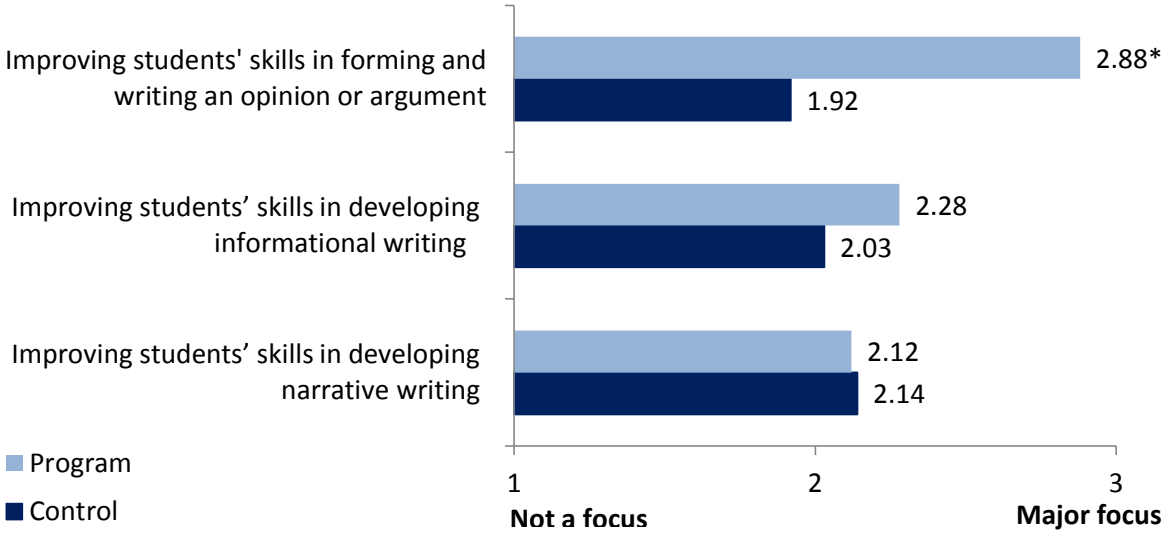
*Note: * denotes a statistically significant difference (*p < .05*) between program and control groups.*
Source: SEED teacher surveys.

SEED professional development focused on argument writing to a greater extent than did professional development in control schools.

The spring survey asked teachers who had participated in writing professional development to characterize whether particular topics were "not a focus," a "minor focus," or a "major focus" of writing professional development during the 2012–13 school year. In their responses, 92% of program school teachers reported that helping students with opinion and argument writing was a major focus of the professional development. Exhibit 3-5 presents teachers' mean response to this question, on a scale of 1 to 3, for teachers in both program and control schools who participated in at least some writing professional

development. While teachers reported some focus on informational and narrative writing, there were no statistically significant differences between program and control schools.

Exhibit 3-5. Teachers' reports on the focus on types of writing in professional development (means), among those who participated in writing professional development



*Note: * denotes a statistically significant difference (*p < .05*) between program and control groups.*
Source: SEED teacher surveys.

Reflecting adherence to the nonnegotiables and common agreements, the focus on argument was a constant theme throughout the SEED professional development. Teachers deconstructed the CCSS-ELA, read articles on the CCSS-ELA and argument writing, discussed claims and the use of evidence, examined mentor text, and viewed demonstration lessons focused on argument writing. They also wrote argument and opinion pieces themselves.

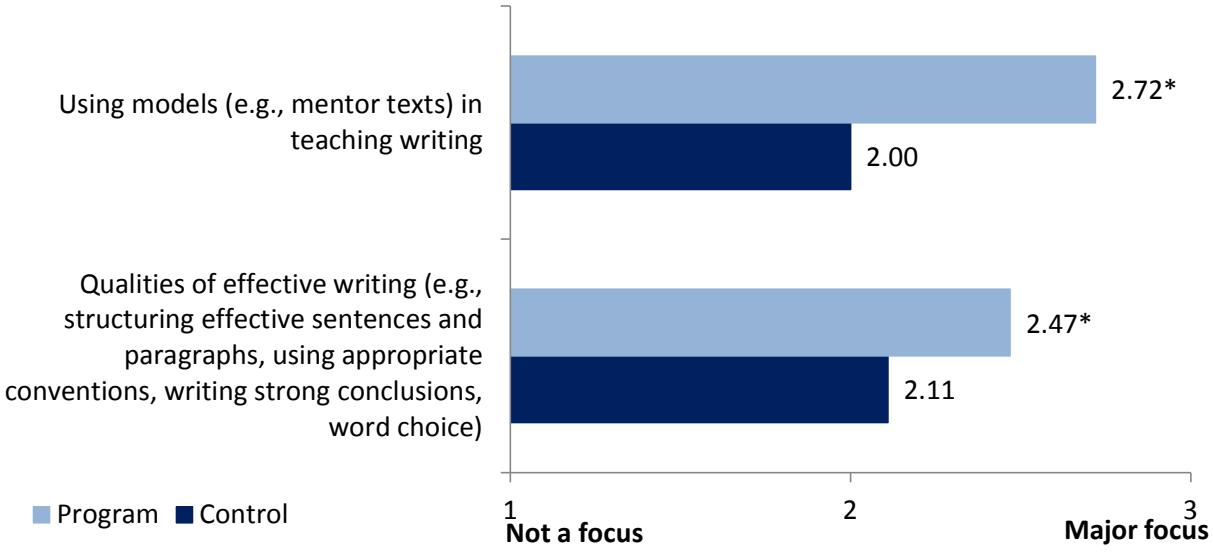
The topics for argument writing varied across Local Writing Project sites. Some sites based the model lessons on content they identified as relevant to students' lives. For example, sites introduced lessons on gum-chewing in school, what types of cookies were the best, and the merits of school uniforms. Students were to take a position on the topic and support that position with evidence. A few Local Writing Project sites presented argument writing lessons based on the content that students were studying in other subject areas. For instance, at one school, a teacher-consultant presented a demonstration lesson that

initiated a longer assignment in which students wrote arguments about who was the more important inventor, Thomas Edison or Benjamin Franklin, as part of a unit on electricity. Students had to make claims and support them with evidence to back their inventor. As part of the long-term assignment, the teacher-consultant also delivered a demonstration lesson on selecting relevant evidence to support a position. The final model lesson for this unit focused on revising for clarity.

SEED professional development incorporated use of models and examined qualities of effective writing to a greater degree than writing professional development at the control schools.

As called for in the common agreements, the use of model or mentor text and examining the qualities of effective writing were a greater foci of the SEED professional development than of the writing professional development in the control schools (Exhibit 3-6). Again, this survey question asked teachers to identify specific topics as "not a focus," a "minor focus," or a "major focus" of the writing professional they participated in during the 2012–13 school year.

Exhibit 3-6. Teachers' reports on the focus on using models and qualities of effective writing in professional development (means), among those who participated in writing professional development



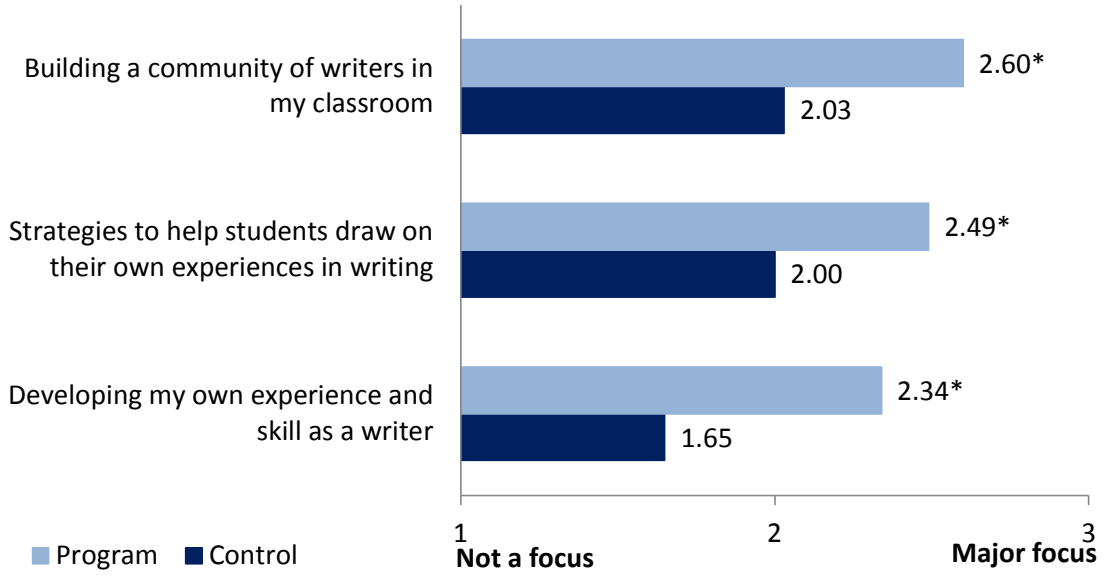
*Note: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys.

The emphasis on using mentor text and examining qualities of good writing often went hand-in-hand, as mentor texts could provide the basis for discussions of qualities of effective writing or the craft of writing. For instance, in one school, teachers examined mentor text as part of a book study. In the words of a teacher, "we had really developed thinking about mentor text as a source when thinking about your craft." The teacher discussed how mentor text can also serve as a model for teachers' own writing, citing an example from the short story "Eleven": The sentences are "beautifully and interestingly written and then we tried it ourselves, modeled after that sentence… It was interesting to think about both grammar and craft." In this case, emulating a mentor text focused teachers' attention on the craft of writing.

Program school teachers reported helping students draw on their own experiences in writing and developing themselves as writers as foci of writing professional development to a greater degree than teachers at control schools. These are both tools to build community among teachers and students.

Teachers at program schools who participated in writing professional development more frequently identified building writing communities in their classrooms, enabling students to draw on their own experiences in writing, and developing their own skills and experiences as writers as a focus of writing professional development than teachers at control schools who participated in writing professional development (Exhibit 3-7). These practices are consistent with the SEED common agreements regarding engaging students' funds of knowledge and engaging teachers in writing themselves.

Exhibit 3-7. Teachers' reports on the focus on building community, drawing on students' experiences, and developing teachers as writers in professional development (means), among those who participated in writing professional development



*Note: * denotes a statistically significant difference (*p < *.05) between program and control groups.*
Source: SEED teacher surveys.

Strategies to help students draw on their own experiences—or funds of knowledge—often centered on increased student choice and more free writing or journaling. Students drew on their experiences as they jotted down ideas for longer pieces, wrote in journals, and identified evidence to support claims on a variety of topics, from ear piercing to unlimited computer time, that teacher-consultants and teachers thought were relevant to their lives.

A hallmark of Writing Project professional development—and one of the SEED common agreements—is engaging teachers in writing themselves. Not surprisingly, teachers in program schools were much more likely to identify participating in their own writing as a focus of their writing professional development than teachers in the control schools. In fact, teachers in SEED schools regularly wrote in professional development and were encouraged to write alongside their students in class. This experience gave teachers an understanding of the writing they were asking their students to do while also working to build community among the teachers and students alike. One program school teacher summarized that sense of understanding:

> I can feel the stress of, my heart beating faster thinking, "I've got to write this," and thinking… "The student across from me is going to look at it. She's really writing, and I can't think of anything to put on my paper right now. It's taking me longer." So I'm seeing what some of those students are feeling. But then, on another side, getting up and talking, I'm seeing that some of these students are saying "Well, hey, that student has the same interest—music, sports, or whatever—that I have." Or "He or she thinks the same way I do." So, to me, it can be stressful, but then, after you really get into it, "Hey, it's not that bad."

Sharing writing and personal experiences through writing was a way of building community in professional development and in the classroom. As a teacher-consultant explained, "I ask teachers to consider their own practice and their own classrooms and reflect on what they saw that will help them to improve, tweak, or add something to their own way of teaching. We go around and share these ideas, creating a community of teachers and learners." As described by a teacher, students sharing their writing also enabled community building, "There's so much building community in the classroom and sharing and talking and seeing good examples of quality writing."

Local Writing Project sites and schools varied in the extent to which they engaged in ongoing planning and review of professional development and implementation.

Providing professional development that is embedded in teachers' contexts and meets teachers' needs requires ongoing communication between schools and Local Writing Project sites. Acknowledging the importance of co-planning, the National Writing Project established this as a nonnegotiable.

Interviews and PDM reports revealed that this type of joint work occurred to varying degrees in the SEED work. At some schools, teacher-consultants worked to match professional development to teachers' needs by gaining an understanding of the teachers' practice and working to provide professional development to address areas for growth. For instance, at several schools, teacher-consultants quickly realized that teacher baseline writing practices were lower than they had expected and went "back to writing basics" in the professional development—focusing on types of writing and creating a writing classroom, for instance. Local Writing Project sites tailored their work to the context in other ways, too. At one school, the Local Writing Project site addressed contextual issues by: (1) aligning the SEED professional development to the district's curriculum framework,

(2) shifting the focus of the professional development in order to respond to pressures teachers felt to raise test scores by emphasizing "close reading" to improve students' scores on "response to reading," and (3) individualizing each model lesson to meet teachers' needs. At the same time, narrative and argument writing and a gradual release of students to independent work were common themes in SEED professional development. As the teacher-consultant reported in a PDM document:

> Originally I planned to do the same lesson in each classroom, but when speaking with each teacher I realized that each class had different instructional needs. However, I used the same template to plan each lesson…aligned to instructional needs within a gradual release model.

Teachers appreciated the customization of demonstration lessons. As one noted, "[Customization] has been very helpful because it's not just the generic things for everyone; it's what we individually need help with or what we need more support with."

Good communication between the Local Writing Project site and school provided a foundation for this individualization, as the teacher-consultant was aware of teachers' concerns. This particular teacher-consultant knew the district well, kept in close contact with the principal and teachers by phone and email, and developed enough trust so teachers were willing to share their concerns. As the principal described it, "[The teacher-consultant] comes in as 'I'm here to support you, to help you, to guide you'…. She's very positive in her approach and I think that's what helps [teachers] to open up."

At other sites, joint planning and reflection was quite limited. Therefore, the professional development was not as responsive to school practices, district requirements, or teachers' stated needs. For instance, one Local Writing Project site provided the exact same professional development to two very different schools where teachers had different baseline practices and needs. At one of the schools, the teachers reported minimal preexisting writing instruction, while at the other school, teachers reported using a writers' workshop model prior to the start of the SEED work. Despite these differences, both schools began professional development with a session on building a writing community in the classroom followed by a workshop on the layout and logistics of a classroom set up for a writers' workshop. The teachers that already felt confident in their enactment of a writers' workshop had difficulty understanding how this professional development met their needs. When asked how the professional plan was developed, the instructional coach responded,

> They didn't ask me what we needed to do…. They didn't look at our test data…. They…didn't observe teachers teaching. They didn't do anything but walk in here the first day and start preaching about the writer's workshop. And we're all looking at each other going, "Duh. We've been doing this."

As a result of the lack of co-planning, teachers perceived that the Local Writing Project site was not responsive to their needs or to their existing practice.

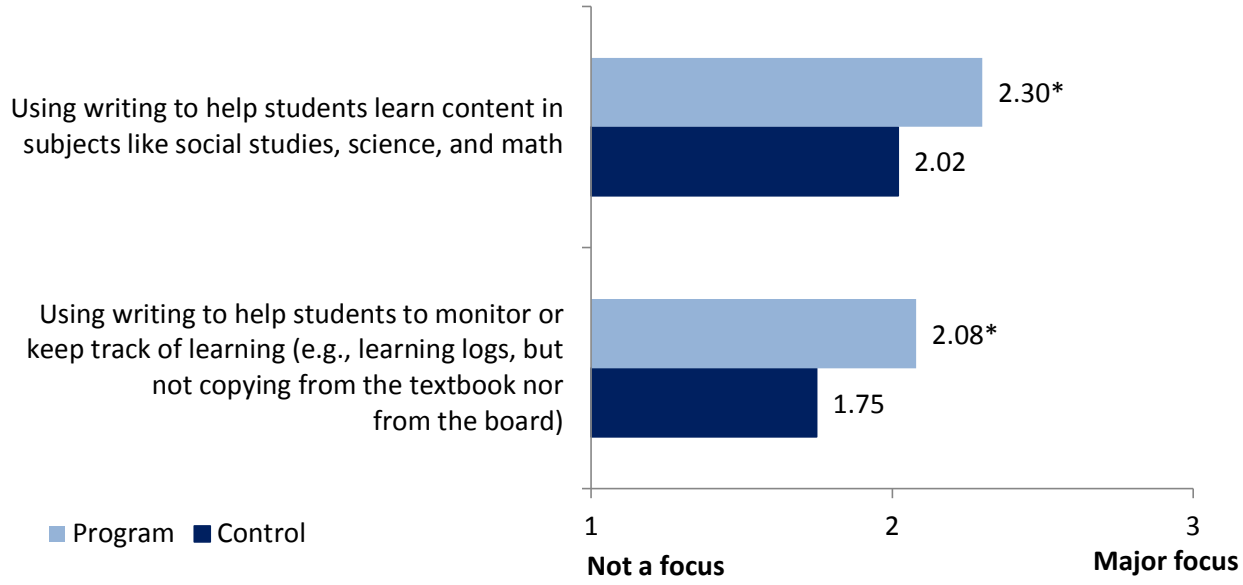
Focus of the Professional Development—Alignment to Common Writing Project Practices

SEED professional development clearly reflected the nonnegotiables and common agreements. Teachers collectively participated in many hours of multiple modes of professional development focused on the CCSS-ELA, especially argument writing. Examining models of effective writing, the craft of writing, building on students' funds of knowledge, and teachers experiencing writing themselves were widespread foci of SEED professional development. SEED professional development also reflected common Writing Project practices that were not specified by the nonnegotiables or common agreements, but are reflected in the evaluation framework. In particular, SEED professional development focused on writing in service of learning (which is seen as an authentic writing task) and writing as a process. The following section highlights these facets of the work.

SEED professional development focused on using writing to learn and to keep track of learning across content areas to a greater extent than did professional development in control schools.

When asked to identify the foci of writing professional development, program school teachers who had participated in writing professional development reported a greater focus on using writing as a way to support learning in content areas and to monitor and to keep track of their learning to a greater degree than teachers who had participated in writing professional development in control schools (Exhibit 3-8).

Exhibit 3-8. Teachers' reports on the focus on writing to learn and monitor learning in professional development (means), among those who participated in writing professional development



SEED teachers noted a focus on writing-to-learn strategies across subject areas; in some cases, these strategies—such as journaling, quick writes, and exit slips—also supported students to monitor their own learning. In the words of a principal,

> I don't think the purpose of the professional development was like in the old days or previously when we taught kids the writing process, you know the drafting, the revising, the editing, and all that. That was part of it, but the bigger focus was understanding, comprehending, using the writing as a means to understand social science, understand science, understand math, understand literacy and reading.

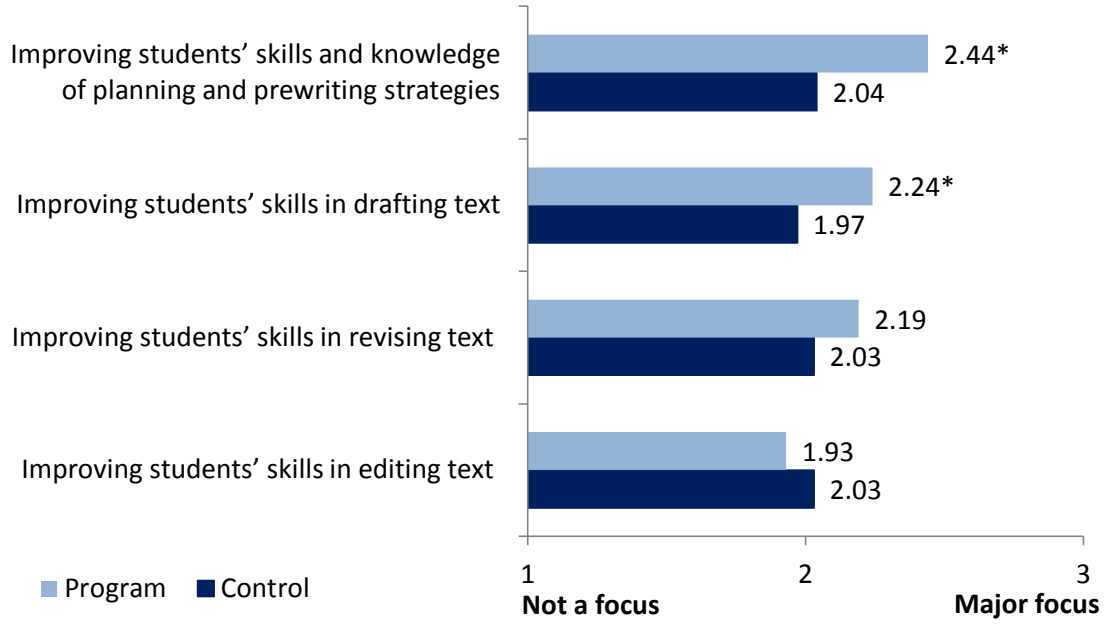
Thus, the professional development presented ways in which writing can be used to deepen students' understanding and keep track of learning in the content areas. In many instances, this focus coexisted with a focus on writing as a process.

Teachers in program schools were more likely than teachers in control schools to identify some aspects of the writing process as a focus of writing professional development, specifically prewriting and drafting.

When asked on the survey to identify areas on which 2012–13 writing professional development concentrated, teachers in program schools reported a greater focus on

planning/prewriting and drafting text than their counterparts in control schools (Exhibit 3-9). However, there were no significant differences in teachers' reports of the extent to which professional development focused on revising and editing.

Exhibit 3-9. Teachers' reports on the focus on writing processes in professional development (means), among those who participated in writing professional development



*Note: * denotes a statistically significant difference (*p < *.05) between program and control groups.*
Source: SEED teacher surveys.

Planning and prewriting strategies, as well as drafting, were foci across the Local Writing Project sites. Teacher-consultants introduced strategies such as the writer's notebook, graphic organizers, and free-writes as ways of getting students started in their writing. Building students' stamina and fluency, especially through informal writing, was central to the work at many schools.

The extent to which professional development focused on revision and editing varied. While most Local Writing Project sites addressed revision and editing to some extent, they seemed to focus more attention on planning to write and prewriting. A teacher from a school where the professional development concentrated on generating writing described her experience with the professional development:

> I'm not perceiving [the professional development] being so focused on the importance of process like revision [or] editing, although we did discuss that, and we had demonstrations on how to do those sorts of thing[s]. I think it leaned more towards having kids feel good about themselves and see themselves as writers for the content.

A number of factors may have led to a focus on prewriting and drafting. One may be difficulty in getting students started in writing. The principal from the same school as the above teacher spoke to this issue: "Our kids do not know how to start.… The biggest challenge that we have is they don't know how to get started. They don't know how to put it in words."

Teachers spoke of "reluctant writers," and Local Writing Project sites' teacher-consultants saw a need to support students as they began to write. As a teacher-consultant explained, "I really just wanted them to spend that first month of school by getting the writing stamina going using their writer's notebooks to generate lots of seed pieces." Further, limited writing in the schools before the SEED professional development may have led Local Writing Project sites to encourage writing in a variety of genres, both formal and informal, as they sought to introduce writing in ways that teachers could easily adopt.

Teachers' Experiences with SEED Professional Development

Across the nation, teachers are in the early stages of shifting their instruction to align to the CCSS-ELA. For many teachers, this shift involves incorporating more argument and informational writing into their practice. Just as this is a new area for teachers, it is also new for the Local Writing Project sites as they developed the SEED professional development. This section explores participant perceptions of the overall experience of SEED professional development as both teachers and professional developers began to adapt their practice to the CCSS-ELA.

The arc of SEED professional development was clear to some teachers, but less clear to others.

At some schools, teachers clearly understood the focus of the SEED professional development and how it supported their learning. For instance, at one school, teachers

consistently reported that SEED professional development was designed to support them with opinion and informational writing, the craft of writing, and revision. In other words, the aims of the SEED grant remained front and center at this school throughout the year. Importantly, while maintaining a focus on these goals, the Local Writing Project site's teacher-consultant was still able to be responsive to teacher needs by folding in teacher requests under the umbrella of improving argument and informational writing. For example, when teaching argument writing, teachers noticed that students were copying straight from sources and requested help with this issue. The teacher-consultant subsequently taught a lesson on paraphrasing. This model lesson simultaneously tackled three different needs: (1) to address an issue students were grappling with in their writing, (2) to improve students' argument and informational writing, and (3) to incorporate social studies content. As a teacher reported, the teacher-consultant "make[s] everything cohesive and work together."

While other Local Writing Project sites may have also had clear plans for SEED professional development, teachers did not experience it this way. As a teacher described it,

> [The professional development] just seems like it's very hit or miss. It's like they'll just introduce a topic and tell you a few things about it, and then it's not really connected to what they're going to do next.… It seems like it's just too hodgepodge. So I've had trouble figuring out how it all fits together.

Several factors may have contributed when teachers did not experience SEED professional development as coherent. One possibility is that some teachers may have needed more scaffolding to see the bigger picture or how ideas from individual professional development events could be used. Another factor may have been that having multiple teacher-consultants present SEED professional development may also have contributed to teachers' perceiving discontinuity in the professional development. At times, teachers felt that each teacher-consultant came in with different ideas rather than building off of each other's work.

Supports for teachers' implementation of new practices also varied across Local Writing Project sites.

One school year (i.e., 8 or 9 months) is not a long time for teachers to learn about and implement significant changes in their practice. While all Local Writing Project sites aimed to have teachers enact changes in practice as a result of participation in SEED professional development, some sites supported teachers' implementation of new practices to a greater

degree than others. These sites provided step-by-step scaffolding as teachers learned about new practices, tried the practices in their classrooms, and started applying what they learned in lessons they developed on their own. For instance, one Local Writing Project site began by introducing a new practice in a workshop. Teachers would then try the strategy in the role of learners. Experiencing the strategy in that setting was helpful because, as one teacher explained, "I need to see and feel what my students are seeing and feeling." After participating in the lesson, teachers would spend time reflecting on how to bring the lesson back to their classrooms. Next, the teacher-consultant would model the lesson in one teacher's classroom while the rest of the grade-level teachers watched. In the words of the teacher-consultant, "It's one thing for me to ask those teachers to do it as an adult, but then how does it transform? How does it go with the kids? Hence, the classroom demonstrations came out of that." Homework assignments asked teachers to take the lesson a step further to apply what they learned into a new lesson. For instance, one homework assignment was: "(1) In grade-level teams, design a plan to implement learning logs in the classroom. (2) Implement learning logs in the classroom. (3) Based on students' writing, make a plan for the next piece of writing, including specific goals for revision and editing." This assignment was designed to move the teachers a step forward towards applying strategies independently. At the same time, the assignment built on the collaborative structure of grade-level teams.

In other sites, teacher-consultants included important scaffolding to support enactment of new practices in the classroom, but for various reasons the supports were not as strong as they might have been. For example, demonstration lessons formed an important part of the professional development at one site. Demonstration lessons can be a powerful way to buttress implementation of new practices in a classroom because they give teachers insights into what enactment looks like with their students. However, because the demonstration lessons only lasted an hour and were used to get a multi-day lesson started, teachers only got to see how the beginning of the lesson played out. This meant teachers never saw other aspects of process writing demonstrated. A teacher described her experience with demonstration lessons: "The lessons that I have seen so far… is the graphic organizer and then maybe starting to write their…first draft…They don't have time to sit there and to revise and all that other stuff."

And, finally, some sites did not focus on supporting classroom implementation. For instance, one site focused on helping teachers imagine another way of teaching, connecting teachers to their writing, and reflecting on teaching ideas. While these areas of focus may

be important, they do not specifically support teachers in implementing new practices in their classrooms or enable teachers to teach to the CCSS. In fact, teachers at this school did not connect the professional development to the CCSS-ELA or argument writing. A teacher expressed concerns about this approach, explaining that the teacher-consultants did not explicitly link the professional development to the CCSS: "Since the Common Core was new to us, it would have been nice to have seen, 'This is the standard. Let's unpack it. Now how can we implement it?'" This teacher described how difficult she found making the connections on her own. "The hardest part for me…was just trying to find a way to take something that was shared and make it fit in my classroom."

Conclusion

When looking across Local Writing Project sites and schools, the commonalities of SEED professional development and their alignment to SEED nonnegotiables and common agreements become clear. Teachers in program schools participated in a substantial number of hours of professional development and experienced a wide range of professional development strategies. SEED professional development centered on argument writing and on strategies to improve the quality of students' writing, particularly through the use of mentor text. In addition, SEED professional development emphasized writing to support learning in the content areas and the planning and drafting stages of the writing process. This is no small feat, given that schools are still in the early days of CCSS-ELA implementation.

While SEED professional development shared attributes across sites, teachers at different schools had diverse perceptions of the overall coherence and trajectory of the professional development. Moreover, Local Writing Project sites varied in the extent to which they adapted the professional development to local realities and supported implementation of new practices. Overall, however, the professional development in program schools clearly differed from that at "business as usual" control schools.

Chapter 4. Impacts on Teacher Outcomes

In general, the extent to which the CCSS-ELA lead to improved student writing depends on teachers' instructional practice. Prior research on policy implementation and changes in teacher practice suggests that the process by which policies influence instruction is complex and varies across individuals and contexts. For policies to impact teacher practice, teachers must first understand the policy and its implications for their practice. With their context and prior knowledge as a lens, teachers then respond to the policy in ways that may be more or less aligned with the initial intent of the policy (Lipsky, 1978; McLaughlin, 1987; Spillane, Reiser, & Reimer, 2002). Professional development can play a crucial role in helping teachers to understand new policies, revise their vision of effective instruction, and acquire the strategies necessary to implement that vision in their classroom. Chapter 3 demonstrated that SEED professional development adhered to program design principles and provided teachers with opportunities to learn about the CCSS-ELA. This chapter addresses the impact of that professional development on teacher outcomes—namely, teacher knowledge, skills, and instructional practices.

The evaluation framework hypothesized that the effects of SEED professional development on teacher outcomes would be mediated by teachers' prior knowledge, skills, beliefs, and practices. The mediating factors that influence that causal relationship are themselves situated in the educational context that surrounds teachers' instructional practice. This chapter addresses this diverse array of interactions. The chapter begins with a brief description of teacher outcome measures and instructional practice at baseline. We then present data on the impact of SEED professional development on teacher knowledge, skills, and beliefs, and teacher instructional practices.

Measures of Teacher Outcomes

Two main data collection activities, the teacher surveys and interviews, provide the data presented in this chapter. The teacher surveys provide measures of:

- Teacher knowledge, skills, and beliefs
- Teacher instructional practices
    - Time spent on writing
    - Teaching argument
    - Writing processes
    - Authentic tasks, choice, and inquiry

When we compare teachers in the program and control groups, we report model-adjusted means. The hierarchical linear models (HLM) used to determine results takes teachers' responses in spring 2013 and identifies the mean, controlling for the teachers' responses to the same items in fall 2012, and their grade level.[25] By including prior responses and a grade-level indicator, we adjust for preexisting differences between the program and control groups on these measures. A coefficient indicating whether each teacher is in a program or a control school is used to estimate the difference between program and control teachers and to determine whether that difference is statistically significant.

In a few instances, when it is important to know the absolute frequency as well as the extent of difference between the program and control group, we report descriptive data for the program and control groups on a given survey item. In these cases, we have not conducted additional statistical tests to assess the difference between program and control groups because the model-adjusted means provide the best estimate of the difference across the entire distribution of responses on these measures.

Interviews provide the best source of data on how teachers and administrators made meaning of the context that surrounded their professional learning, instruction, and leadership and how these factors affected their responses to SEED professional development. These data can, therefore, provide us with key insights into why and how SEED professional development impacted some teacher practices more than others.

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[25] HLM ensures accurate standard errors in estimating the effect of the SEED program in the presence of clustered data (Raudenbush & Bryk, 2002).

Teacher Prior Practice

The evaluation framework posited that one of the factors that would affect teacher uptake of new practices from professional development was their prior instructional practice. The teacher survey from fall 2012 provides insight into the practices in the program schools when they began the SEED program.[26] Here, we present a small selection of items that describe the extent to which teachers asked students to write at baseline:

- Teachers in program schools reported that students spent an average of 115 minutes writing in a typical week.
- On average, 67% of program teachers reported asking students to write over a shorter time frame (i.e., a single sitting or a day or two) at least once a week.
- On average, 40% of teachers in program schools reported asking students to write multiple related paragraphs of less than two pages at least weekly.

These findings suggest that writing had a relatively small place in the curriculum at program schools in the year preceding schools' participation in SEED professional development.

Teacher Knowledge, Skills, and Beliefs

SEED professional development sought to prepare teachers to meet the new CCSS-ELA expectations around student writing by supporting them to develop the knowledge and skills to make necessary instructional shifts. For teachers to make instructional shifts, they must be motivated to change their instruction and have the knowledge and skills to do so. The evaluation framework imagined these not only as teacher outcomes, but also as mediators of change in instructional practice. The framework assumed a recursive

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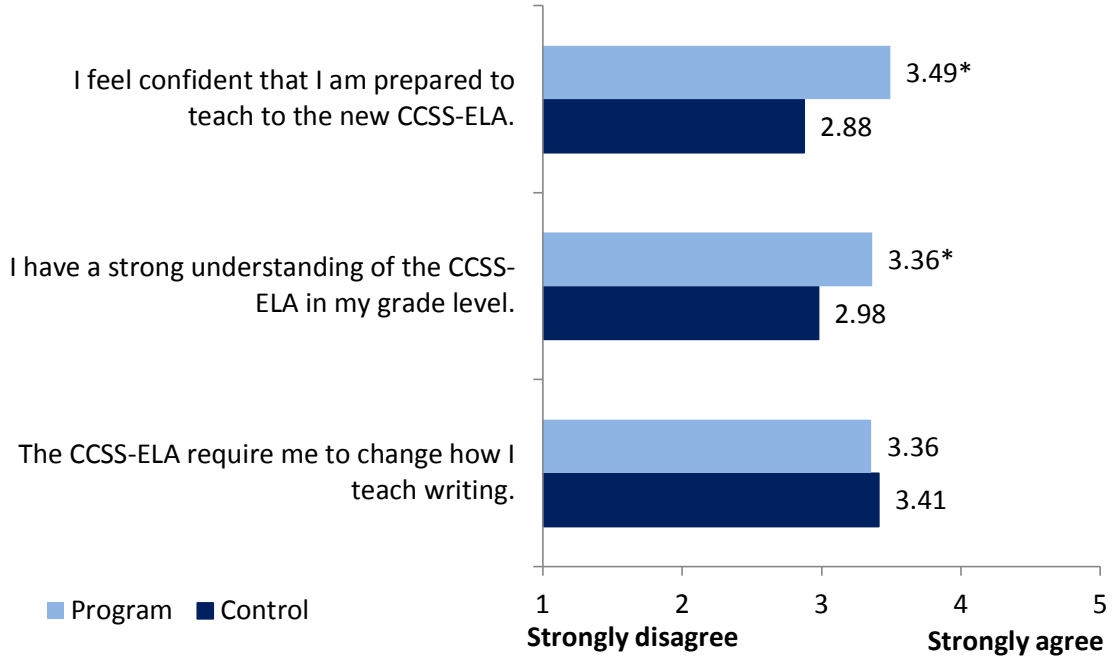
[26] The research team administered the survey in early fall in order to measure baseline teacher practice. Questions about instructional practice asked about the prior school year. As a result, the research team excluded teachers who were new to the program schools, new to the program district, or who had taught different grades the prior year from the analysis of baseline instructional practice because those teachers did not have a comparable teaching assignment on which to base responses. The SEED Year 1 Report (Gallagher et al., 2012) provides comprehensive survey results and shows that program and control schools were equivalent at baseline.

relationship between teacher knowledge, skills, beliefs, and practice; as teachers implement practices, their instructional skills and attitudes toward writing would improve as well—although we do not model that relationship statistically.

SEED professional development had positive impacts on some aspects of teachers' knowledge and beliefs about the CCSS-ELA.

Teachers participated in SEED professional development while most of their schools were in the early stages of adopting the CCSS-ELA. As a result, important goals for SEED professional development were to build teacher understanding of the standards and the shifts in practice they require, as well as to develop teacher self-efficacy in teaching to them. Teachers in program schools reported greater confidence in their ability to teach to the CCSS-ELA and a stronger understanding of how to teach to the new CCSS-ELA than teachers in control schools. SEED did not impact teachers' sense that they would need to change their practice in response to the CCSS-ELA (Exhibit 4-1).

Exhibit 4-1. Teachers' reported self-confidence in their knowledge and skills related to the CCSS-ELA (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Scale points correspond to the following: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

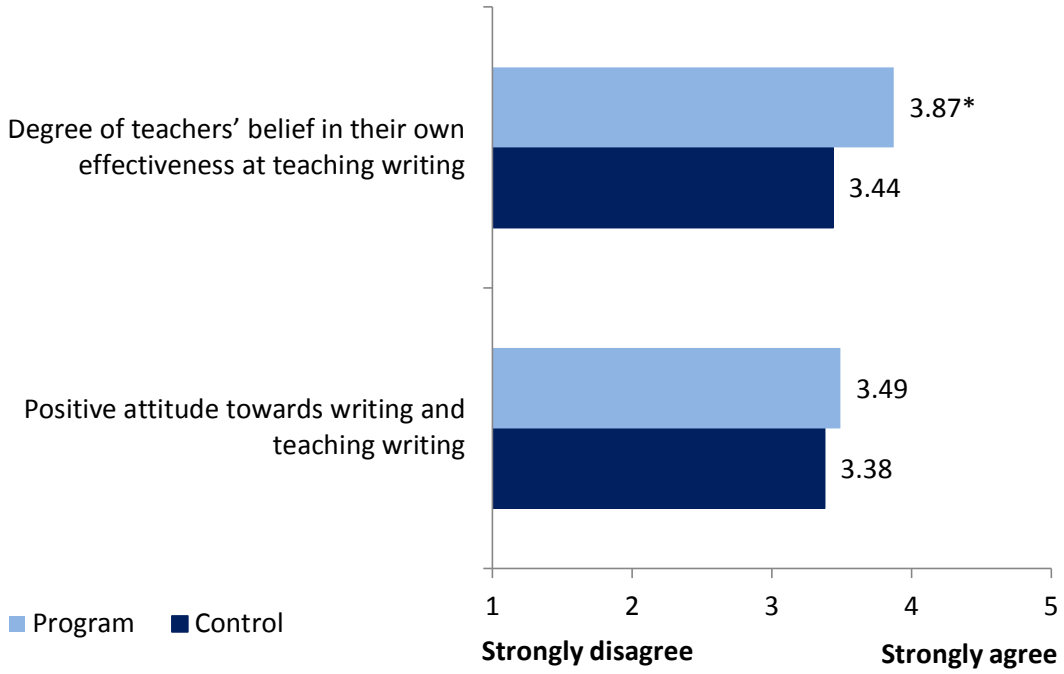
Source: SEED teacher surveys.

In all cases, the averages for program schools hovered between three and four on the five-point scale, suggesting that after 1 year of SEED, teachers did not yet feel confident about the CCSS-ELA and its implications for their teaching. Focusing solely on teachers' self-reports about their understanding of the CCSS-ELA, descriptive data show that in program schools, 48% of teachers agreed and 5% of teachers strongly agreed that they had a strong understanding of the CCSS-ELA. Additionally, while our baseline data on teacher practices suggest that many teachers would need to change their instruction to align with the CCSS, in program schools 44% of teachers agreed and 4% of teachers strongly agreed that they would need to change their practices. There are many plausible reasons for these results, including that teachers may think that their current practices align with the CCSS-ELA, that they are unaware of the differences between their current practices and those required by the CCSS-ELA, or that the potential for rolling back the CCSS-ELA in their state leaves them uncertain about the implications for their instruction. Overall, however, these results show both that SEED positively impacted teachers' understanding of the CCSS-ELA, but also that the CCSS-ELA are new and teachers have much to learn about the standards and the implications for their instructional practice.

SEED professional development impacted teachers' self-efficacy for teaching writing, particularly in the area of argument writing. There was no evidence of impact on more general attitudes about writing or teaching writing.

One desired outcome of SEED was to improve teachers' comfort with, enjoyment of, and efficacy for teaching writing. SRI researchers created two factors to measure these attitudes. The first was a factor on self-efficacy for writing instruction that drew on a series of survey items about confidence in teaching writing, including teachers' self-confidence in their ability to teach argument. Researchers also created a factor from a series of more general items about teachers' enjoyment of writing and teaching writing. Teachers in program schools reported higher levels of self-efficacy for teaching writing than teachers in control schools. There was no evidence of differences in teachers' general attitudes towards writing and teaching writing (Exhibit 4-2).

Exhibit 4-2. Teachers' reports of self-efficacy for writing instruction (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

Scale points correspond to the following: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

The first measure is a factor created by averaging the following survey items: I am effective at teaching opinion and argumentative writing; I am effective at integrating writing into my content area of instruction; I am effective at structuring classroom time to allow for students' planning, drafting, and revising of their writing.

The second measure is a factor created by averaging the following items: I like to write, I like planning, drafting, and revising my own written work, I like to teach creative writing, and I like to teach information or nonfiction writing.

Source: SEED teacher surveys.

One item that made up the self-efficacy for teaching writing factor asked about opinion and argument writing—a topic of particular interest given SEED's focus. Looking descriptively at this item, 73% of program teachers agreed or strongly agreed that they were effective at teaching opinion and argument writing, compared to 47% of control teachers.

Interviews support the finding that teachers in most program schools felt an increased knowledge and/or sense of confidence in their ability to teach writing. One teacher explained that, although she still did not necessarily enjoy writing herself, the professional development improved her knowledge and comfort in teaching writing,

> I can't say that I love to write myself…. I don't mind it, but it's not something I would just do on my own…. [B]ut in terms of my knowledge, I feel way more comfortable…. [T]here [is] still stuff I need to know, but she [teacher-consultant] provided…unbelievable PD for our school…. [I]n terms of my writing instruction, I think this year was kind of a trial run, I think I'll be better at it next year but I think this year I was 100 times better than I have been in the last 14 years…. I think that I've definitely learned a lot.

The interview data also reveal instances in which teachers' confidence in their ability to teach writing did not increase. A veteran teacher who had used Step Up To Writing for many years explained, "Until about a month ago, this program [SEED] has thrown out what I had and what I needed. In its place was claim, evidence, prove it. Until about a month or so ago, I lost what I had and had nothing." The teacher added that, over the course of the year, she began to gain comfort with the new instructional practices. Interview data suggest that this type of dip in confidence, which is well-recognized in the literature on educational change (Fullan, 2001), was most common among experienced teachers who were confident in instructional practices that differed from those taught by SEED. We turn now to examining the impact of SEED professional development on teachers' instructional practices.

Instructional Practices

The teacher instructional practice outcomes from the evaluation framework show that SEED is designed to improve student writing by improving or increasing teachers' abilities to do the following: (1) devote time to teaching writing and provide opportunities for extended writing; (2) teach argument (e.g., language of argument; structure, craft, and word choice, etc.); (3) use a process approach to teach writing and use teacher and student feedback to support revision; and (4) offer authentic tasks and choice. All of these instructional practices are supported by research on effective elementary writing instruction. As a result, we situate the findings within the context of a recent research synthesis, the Institute for Educational Sciences' *Educator's Practice Guide, Teaching Elementary School Students to Be Effective Writers* (Graham et al., 2012). The guide reflects

the field's current understandings of instructional practices in elementary school writing that are believed to contribute to improved student writing.[27]

Time on writing and extended writing tasks

If instructional time devoted to writing is limited or students only write shorter pieces of text, those basic features of students' opportunities to write may place an upper bound on opportunity for students to improve their ability to write more extended arguments. To that end, basic descriptive data on students' opportunities to learn to write should frame interpretations of other aspects of teachers' instructional practices.

SEED professional development aimed to shift the amount of writing and writing instruction occurring in teachers' classrooms. The SEED evaluation framework specifically called on teachers to devote time to teaching writing and provide opportunities for extended writing. The idea is that for student writing to improve, students need both time to write and explicit writing instruction. *Teaching Elementary School Students to Be Effective Writers* recommends that educators provide daily time for students to write. The IES guide states,

> Students need dedicated instructional time to learn the skills and strategies necessary to become effective writers, as well as time to practice what they learn.… The panel recommends a minimum of 1 hour [per day] devoted to writing for students, beginning in 1st grade. The hour should include at least 30 minutes dedicated to teaching a variety of writing strategies, techniques, and skills appropriate to students' levels.… The remaining 30 minutes should be spent on writing practice, where students apply the skills they learned from writing-skills instruction. (Graham et al., 2012, pp. 10–11)

Research suggests teachers typically allocate less time to instruction and student practice in writing than recommended, but there is little national data on the upper elementary grades in particular. Studies of primary grades suggest that students often write 20 to

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[27] This report was based on a search that yielded 1,500 citations for research conducted in the last 20 years on writing instruction and strategies. Of these, 34 were both topically relevant and met What Works Clearinghouse Standards for evidence, and so formed the basis of the review.

30 minutes a day, with very little of that writing focused on expository text (Cutler & Graham, 2008). Data from the 2011 NAEP for eighth graders show that only 25% wrote for 30 or more minutes a day (and only 4% wrote more than 60 minutes a day).[28]

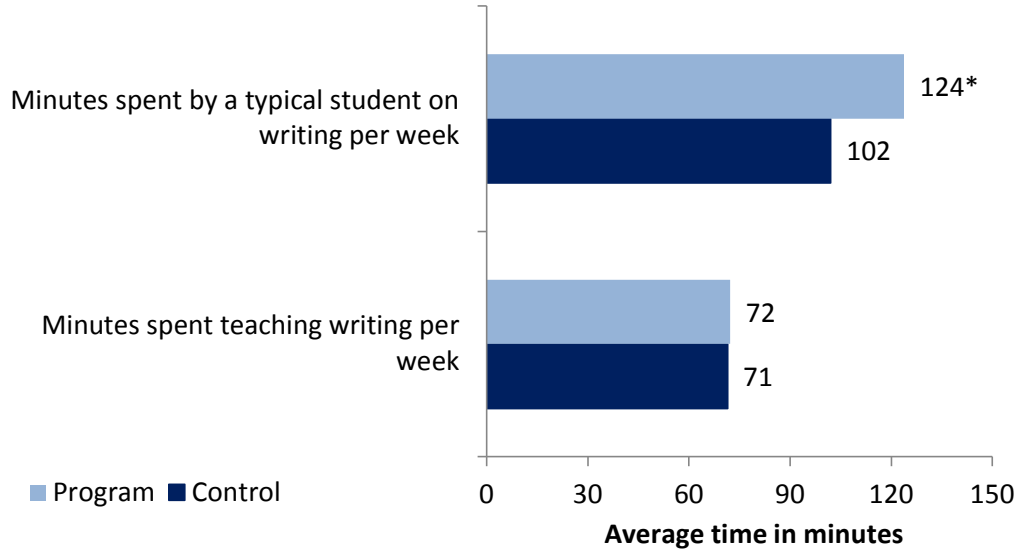
A study of writing instruction in secondary schools also found that only 19% of writing assignments required students to write a paragraph or more (Applebee & Langer, 2011). Applebee and Langer note that only more extended assignments (i.e., three or more pages) give students an opportunity to make arguments supported by evidence, as required by the CCSS-ELA. While these data are from grades outside the range of the study, it is reasonable to assume the younger students in our study would not be expected to write longer pieces than their counterparts in secondary schools. Combined, the research suggests a need to increase time spent on writing and writing instruction as well as the frequency with which students write more extended pieces.

SEED professional development impacted how much time students spent writing, but not how much time teachers spent teaching writing.

Teachers in program schools reported that students spent an average of 124 minutes per week writing, compared to 102 minutes in control schools. However, program teachers did not report spending significantly more time teaching writing than control teachers (Exhibit 4-3).

[28] Because the National Assessment of Education Progress (NAEP) has not administered a writing assessment to elementary students since 1998, little national data exists on elementary school teachers' writing instruction and student performance.

Exhibit 4-3. Teachers' reports on minutes students spent writing and teachers spent teaching writing per week (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*
Source: SEED teacher surveys.

While SEED led to a difference of 20 minutes a week in the time teachers reported students spent writing in program schools compared to control schools, the overall amount of instructional and student practice time spent on writing was still far below recommended levels. Additionally, the cumulative difference is relatively small—if we assume a 180-day (and therefore 36-week) school year, teachers in program schools reported students spent 12 more hours writing, and received no more writing instruction, over the course of the year than teachers in control schools.

Interview data suggest that while the average impact of SEED on the amount of time students spent writing was relatively small, some teachers had found ways to give students substantially more time to write. The prior chapter described the fact that some of the professional development focused on informal writing (e.g., journaling, writing to learn, quick writes), and some teachers reported integrating these activities into their day. A teacher explained that the professional development influenced her to integrate writing activities into her day:

> [The site] didn't just focus on writing…just [during] a writing block of time. It was more or less trying to incorporate it throughout your day, so I find

> myself now…having them write more in their writer's notebooks, maybe about what they've learned, what they still have questions about, what they enjoyed about a topic we're working on. So it's not necessarily just sitting down and going through the full writing process. [Whereas] before I just did writing [during a block of time].

This type of writing throughout the day is distinct from more writing instruction. A principal, in reflecting on lessons learned through implementing 1 year of SEED, noted that she now understood the need to find more time for not only writing practice but also writing instruction:

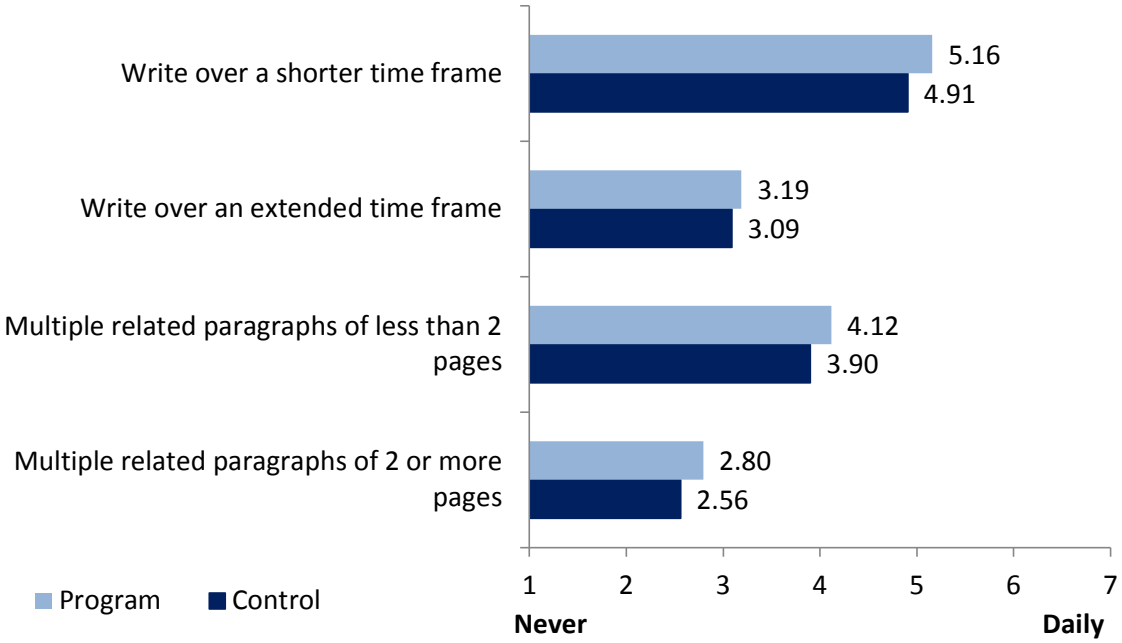
> [We need to work on] ensuring that there is writing time in the schedule with the teachers to actually apply [SEED] because it's so tricky to try to get the kids to write. I mean it's easy to integrate but then there is also another piece where you have to teach the kids the process of how to write. So we need more time in our instructional [programs].

This principal discussed the possibility of finding time for students to practice writing by integrating writing into the disciplines. However, such integration requires rethinking traditional notions of dividing instructional time into discrete blocks allocated to specific subject areas—and finding time for teaching writing in ways other than integration challenges traditional structures even more.

There was no evidence that SEED professional development impacted the length of student writing or students' opportunity to work on a single piece of writing over time.

Teachers answered a question about the frequency with which they had students write over an extended time frame (i.e., over a week or more) and over a shorter time frame (i.e., a single sitting or a day or two). They also responded to a question about how frequently they asked students to complete writing of varying lengths (1 or 2 sentences, 1 paragraph, multiple related paragraphs but less than 2 pages, and multiple related paragraphs of 2 or more pages). Both items had a 7-point scale from "never" (1) to "daily" (7). There was no evidence of differences between program and control teachers in the average frequency they reported asking students to write longer pieces or work on pieces over an extended time frame (Exhibit 4-4).

Exhibit 4-4. Teachers' reports on the time frame and length of students' writing (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often they asked their students to write the listed length. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

Source: SEED teacher surveys.

Looking descriptively at the data, about two-thirds of teachers (67%) in program schools asked students to write multiple related paragraphs of less than two pages at least several times a month. Similarly, 77% of teachers in program schools reported having students write over a shorter time frame (i.e., a single sitting or a day or two) at least weekly.

Teachers' instructional context constrained the extent to which teachers increased time spent on writing instruction and time for students to practice writing.

As explained above, while students in program schools reportedly spent more time writing in class, they did not receive more writing instruction or write longer pieces. Interview data suggest teachers struggled to find time for writing instruction in the context of competing curricular demands and pressure to focus instructional time on tested subjects.

Teachers frequently reported insufficient instructional time as a major barrier to teaching more writing because of competing demands, including the broad content coverage required of elementary school teachers combined with the fact that their instruction was often compartmentalized by subject. For example, in one of the schools, teachers' ability to devote time to writing instruction and even to give students time to write was severely limited by the principal's instructional vision. Her vision included close monitoring of student progress on benchmark tests aligned with state standardized tests and large blocks of instructional time reserved solely for subjects prioritized by the tests or required under state law. A teacher in the school described trying to teach writing under that system:

> What is hard is the way our school is set up. 1 hour of our day starts with reading mastery. 9:45–11:30 is ELA and math. It's about 45 minutes each. And then in the afternoon we have ELD (English Language Development) time and science at the same time. I have ELD students and the others have science. And then there's an hour at the end of the day for PE (Physical Education) or writing. Sometimes I do writing in ELA time. It's sometimes hard to do writing in the compartments of time we have.

What is most notable about this teacher's statement is that she (and reportedly her principal) compartmentalize even ELA and ELD time such that "writing" belongs in a separate time slot, as opposed to being integrated into a balanced approach to literacy development. This teacher's statements suggest greater curricular fragmentation than most teachers in the study reported; however, the broader idea that teachers felt pressure to teach many, often distinct, things was common across many (but not all) program schools.

The pressure applied by state assessment and accountability systems also limited the extent to which teachers used their existing language arts time to work on more extended writing. A school administrator reported:

> [The teachers] think our priority is raising test scores because our scores are not the best in the district…. I think they just feel a lot of pressure to get scores to go up and so that's their focus—…[get] test scores up. Not necessarily be the best reading teacher you can be, [or] the best writing teacher you can be so that test scores will go up. It's more, "What do I need to prepare them for the test?" which becomes test prep…. We do have an on-demand writing assessment. It's only in fifth grade, so the other grades don't

> feel the pressure [for] on-demand [writing] scores to go up, I guess. [Instead, they say], "we're going to do multiple-choice-type stuff for…language mechanics."

Especially as state testing time approached, teachers reported altering their instruction to focus more narrowly on tested content and formats. Writing often was not a tested subject. As a result, the majority of classes at the very least moved away from more extended writing opportunities, and sometimes focused heavily on multiple-choice grammar and conventions questions instead of actual student writing.

Collectively, these results show students received substantially less writing instruction, time to practice writing, and opportunities to engage in extended writing than research recommends. Furthermore, they suggest teachers' instructional context played a key role in limiting students' opportunities to learn to write. These findings frame the rest of the chapter, which reports on how teachers used time devoted to writing.

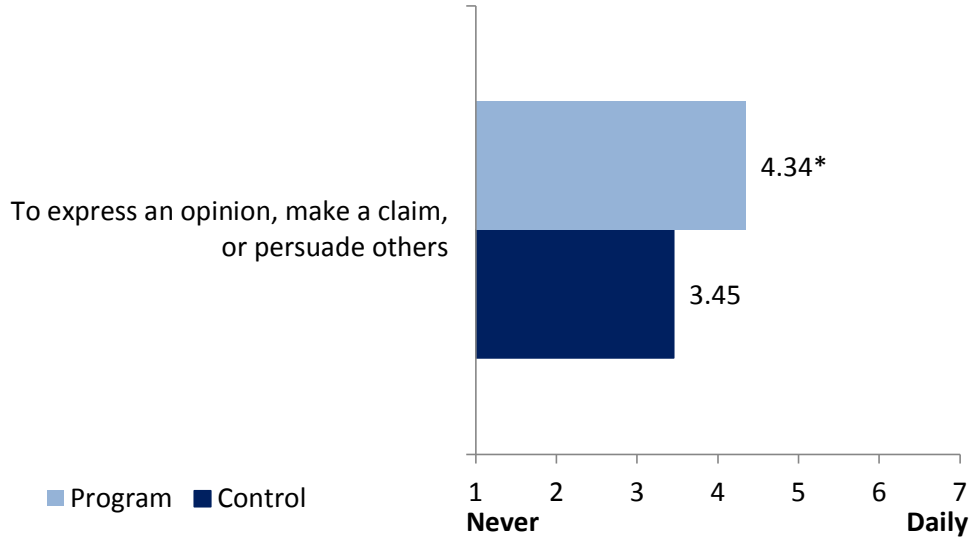
Teaching argument

Writing can serve many purposes both inside and outside of school. *Teaching Elementary Students to Be Effective Writers* recommends that students be taught, "the different purposes for writing and how specific genres, or forms of writing defined by specific features, can help students achieve their writing goals." SEED professional development focused heavily on argument writing. The evaluation framework laid out five instructional practice expectations for teachers related to teaching argument, including using the language of argument; using model text to show students examples of the various forms argument writing can take; providing opportunities to practice developing arguments through both writing and speaking; and engaging students in discipline-specific argument writing (e.g., in history/social studies, science, and other technical subjects).

SEED professional development impacted how frequently teachers asked students to write for the purpose of expressing an opinion.

The survey asked teachers how often students wrote for a variety of purposes on a scale from "never" (1) to "daily" (7). Teachers in program schools more frequently reported asking students to write for the purpose of expressing an opinion, making a claim, or persuading others (Exhibit 4-5).

Exhibit 4-5. Teachers' reports of frequency of asking students to write opinion/argument or persuasive text (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often students in their classes wrote for the listed purposes. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

Source: SEED teacher surveys.

Interviews support the finding that program teachers began asking students to write argument pieces in their classrooms more frequently as a result of SEED professional development. One teacher shared how she would not have implemented argument writing with her students had it not been for SEED professional development:

> When we were talking about argument writing, I had my kids do a lot of argument writing. So, that's definitely something that went from the professional development right into the classroom…which if they had not spoken about argument writing, I probably would not have done.

Another teacher discussed using the terms and intellectual moves related to argument writing throughout her instruction, not just in the context of writing:

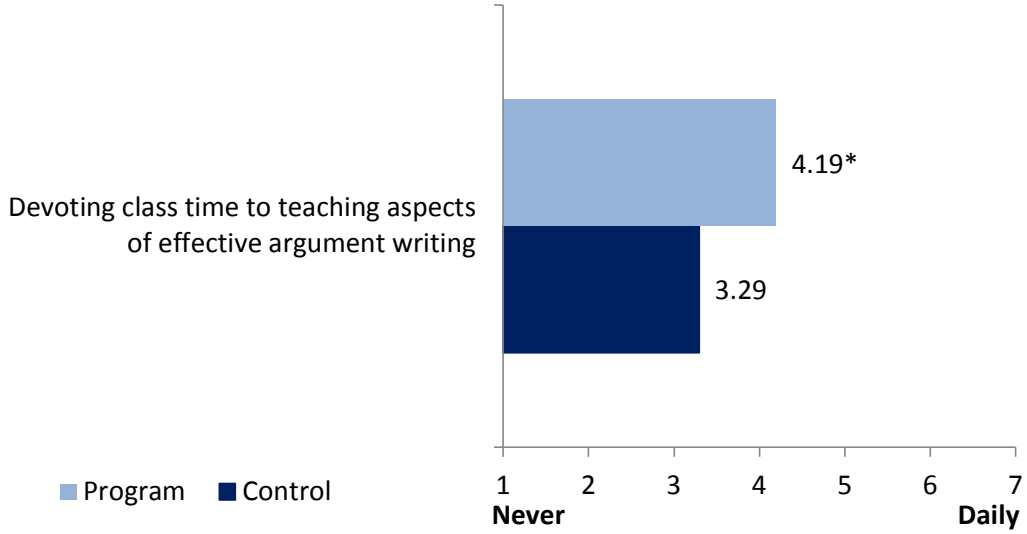
> That's the biggest thing we got out of…the Writing Project is no matter what genre we are doing, it's claim- and evidence-based. So we are using those terms throughout every—not just writing—but through every subject area. So they had to state their claim and then support it using criteria.

Overall, the focus of SEED professional development on argument writing translated into teachers asking students to engage in more argument writing within their classrooms and to become aware of the basic elements of a strong argument.

SEED professional development impacted how frequently teachers taught aspects of effective argument writing.

The survey asked teachers to report the frequency with which they devoted class time to various strategies for teaching argument and to aspects of effective argument writing ranging from "never" (1) to "daily" (7). Researchers used these items to measure the frequency with which teachers devoted class time to teaching effective argument writing. Teachers in program schools reported more frequently devoting class time to goals related to opinion/argument writing than teachers in control schools (Exhibit 4-6).

Exhibit 4-6. Teachers' reports on the frequency of teaching aspects of effective argument writing (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often they devoted class time to the listed goals for teaching opinion/argument writing. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

This measure is a factor averaged from the following items: Teach students organizational strategies for expressing an opinion or making a claim in writing; Teach students about words and phrases specific to expressing an opinion in writing (e.g., certain uses of "because," "for instance," or "specifically"); Teach students how to convey a clear and consistent point of view on a topic; Provide opportunities for students to practice expressing an opinion or claim through speaking (e.g., oral presentation); Use models (e.g., mentor texts) to teach students how to express a written opinion or make an argument; and Teach students how to support their opinions with reasons and evidence.

Source: SEED teacher surveys.

Interviews offered examples of teachers providing students explicit instruction in argument as a result of the professional development. For example, teachers talked about teaching students about supporting claims with evidence. One teacher described the improvement she saw in students' ability to write an argument, which she attributed to explaining to students the importance of supporting their opinions:

> [My students] really are [better at writing argument]. I don't know if [that's] because I'm actually telling them you have an opinion and you need to explain why. Just don't tell me you agree. Tell me why and have details.… They [the Local Writing Project site] gave us a lot of information on how to get the students involved in argument writing. They gave us more procedures in writing argument than [we had] before.

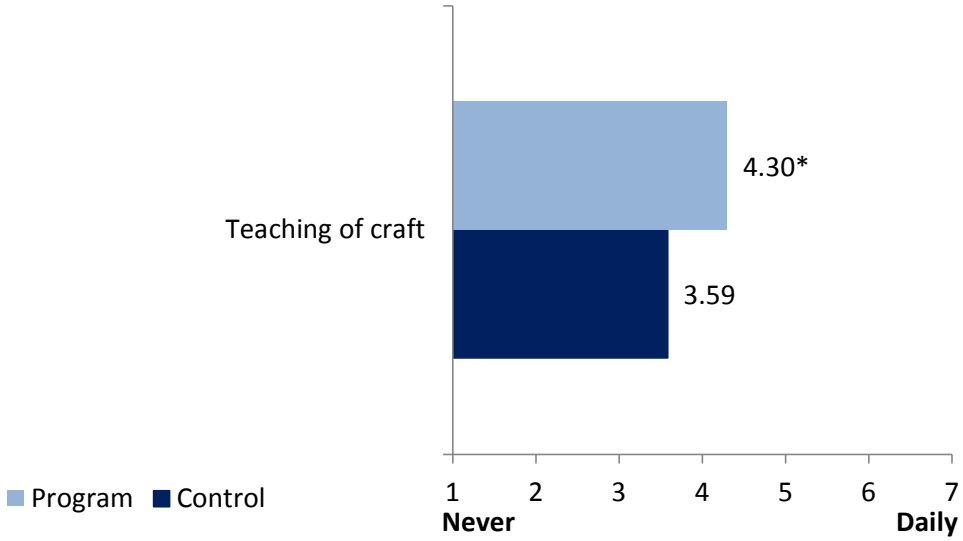
In other interviews, teachers discussed how the idea of "claim and evidence" became core to their thinking about teaching writing.

SEED professional development impacted how frequently teachers taught students elements of craft.

Teaching about the craft of writing—that is the features of writing such as word choice, appropriate voice, and varied sentence structure that make writing effective—is critical for helping students to become strong writers. Effective writing instruction also teaches how these specific elements may change depending on the type of writing (Graham et al., 2012). Because the SEED program focused on argument writing, many survey questions asked specifically about aspects of writers' craft that are relevant to argument writing, in addition to asking more general questions about instruction on craft.[29] The survey asked teachers to report on the frequency with which they taught students various aspects of craft on a scale from "never" (1) to "daily" (7), and created a composite measure of these items. Teachers in program schools reported teaching elements of craft more frequently than those in control schools (Exhibit 4-7).

[29] As a result, some overlap exists between the items in the measure of instruction in effective argument writing and craft.

Exhibit 4-7. Teachers' reports on the frequency of teaching students craft elements (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often they devoted class time to the below listed goals for teaching opinion/argument writing. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

This measure is a factor averaged from the following items: Choosing words effectively; Writing more complex sentences; Teach students organizational strategies for expressing an opinion or making a claim in writing; Teach students about words and phrases specific to expressing an opinion in writing; and Teach students how to convey a clear and consistent point of view on a topic.

Source: SEED teacher surveys.

Teacher interviews offer examples of teachers emphasizing craft elements in instruction. One teacher described how she shifted from focusing on conventions to craft when evaluating student writing:

> I'm really honestly less interested in the spelling and the grammar…. I was the crazy grammar lady. But [now] that really is secondary…. I am confident that I will see that…improved as well, but really I just want to see their voice and see the different craft lessons that they've learned throughout [the year] in their writing.

Teachers also discussed changes in the quality of student writing related to craft—such as sentence complexity, voice, and "hooks." One teacher described the change she saw in her students' writing:

> I feel like their sentences are becoming more mature, they are more complex. [The students] are varying their sentence structure. So their writing is sounding older and a little deeper. [It] makes it more exciting to read. And I have noticed a lot of voice also, a lot of voice this year.

However, the interviews also reveal some variation among teachers in emphasis on craft. In interviews, many teachers' responses suggest that other aspects of the professional development (e.g., claim and evidence) were taken up more prominently than were ideas for teaching the craft of writing. Among teachers who did discuss particular aspects of craft, reports clustered by site based on particular aspects of craft that the Local Writing Project site emphasized in professional development. Teachers in one site, for example, might discuss a particular idea for how to teach "hooks," but not other aspects of craft such as writing more complex and interesting sentences.

Writing processes

SEED professional development sought to move teachers to a place where they implemented a process approach to teaching writing—that is, an approach that involves students in the full range of activities involved in writing, from prewriting to composing text to revising and editing to publishing. The evaluation framework explicitly called out the use of a process approach as one of the teacher practice outcomes. *Teaching Elementary School Students to Be Effective Writers* also recommends students be taught to use writing processes. The guide explains, "Teachers should explain and model the fluid nature in which the components of the writing process work together, so that students can learn to apply strategies flexibly—separately or in combination—when they write" (Graham et al., 2012, p. 12).

SEED professional development impacted program teachers' instruction in generative aspects of writing processes, but there was no evidence of impact on aspects of writing processes focused on refining writing.

The survey asked teachers to report on the frequency with which students engage in various components of the writing process on a scale from "never" (1) to "daily" (7). Teachers in program schools reported students engaged in generative components of writing processes—prewriting and composing text—more frequently than teachers in control schools. There were no statistically significant differences in the frequency with

which teachers asked students to edit or revise text in program versus control schools (Exhibit 4-8).

Exhibit 4-8. Teachers' reports on the frequency with which students engaged in various writing processes (model-adjusted means)

*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often students in their classes engaged in the listed writing-related activities. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

Source: SEED teacher surveys.

These findings mirror those presented in Chapter 3 (Exhibit 3-4) on teacher reports on the content of their writing professional development. Interview data suggest teachers found it relatively easy to implement activities modeled by Local Writing Project sites for helping students generate ideas or get started writing. Teachers described, for example, starting a lesson with students writing down their prior knowledge or integrating activities where students composed short pieces of text (e.g., quick writes) into their instruction:

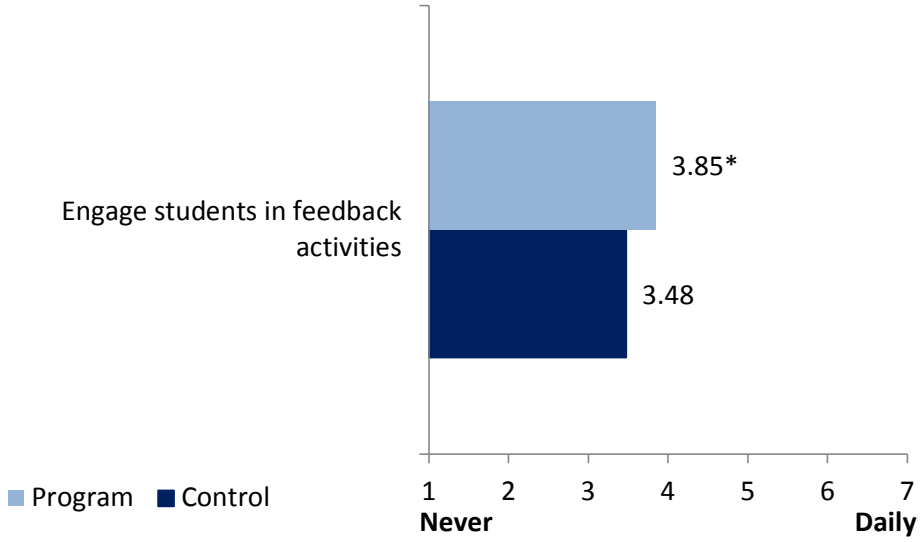
> Normally it comes down to the one draft because they have written so many things on the graphic organizer that they can use that and turn it into paragraphs. And some of them choose to not even write an essay. They want to put it in a Power Point or some kind of visual representation. But it still has the same components that an essay would.

Revising and editing text, on the other hand, are only possible if one is working with existing text. As presented in Exhibit 4-4, SEED professional development did not impact the frequency with which students engaged in writing over more extended time periods. Students might be more likely to revise and edit if teachers engaged students in assignments that lasted multiple days. Impacting revision and editing, therefore, requires a larger shift in practice than impacting composing or brainstorming.

SEED professional development impacted the frequency with which teachers engaged students in feedback activities.

The survey asked teachers to report on the frequency with which they engaged students in various feedback activities on a scale from "never" (1) to "daily" (7) and created a composite measure from these items. Teachers in program schools reported more frequently providing opportunities for students to receive feedback (Exhibit 4-9).

Exhibit 4-9. Teachers' reports on the frequency with which they engaged students in feedback activities (model-adjusted means)



*Notes: * denotes a statistically significant difference (*p < *.05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often students in their classes engaged in the listed writing-related activities. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

This measure is a factor averaged from the following items: Meeting individually with the teacher to get oral feedback or discuss how to improve his or her writing; Reviewing written feedback on their own writing given by the teacher; and Receiving feedback from peers on their writing.

Source: SEED teacher surveys.

Although SEED professional development did not impact the frequency with which teachers asked students to engage in revision and editing activities (Exhibit 4-8), feedback often supports and informs writers in refining and modifying their pieces.

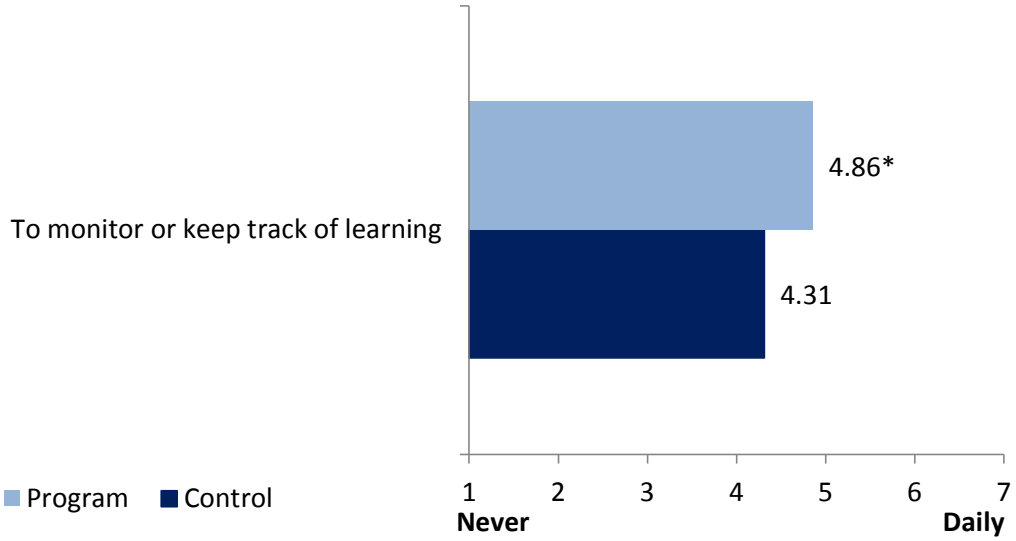
Authentic tasks

The final main recommendation of *Teaching Elementary Students to Be Effective Writers* (Graham et al., 2012) is that teachers create an engaged community of writers. The evaluation framework indicated that SEED strove to promote two teacher practices that are part of the definition of an engaged community of writers as defined by Graham et al., (2012)—namely, that teachers will engage students in authentic tasks and facilitate student choice in writing. Many Local Writing Projects conceived of authentic writing tasks as those in which writing played an important and authentic role in supporting learning (e.g., writing to learn, writing for external audiences).

SEED professional development impacted teachers' use of writing as an integral part of learning.

The teacher survey asked about several ways that writing could be used to support learning. The survey asked teachers to report how frequently, on a scale from "never" (1) to "daily" (7), they had students write to monitor their learning. The SEED program impacted the frequency with which teachers reported asking students to write for the purpose of monitoring learning (Exhibit 4-10).

Exhibit 4-10. Teachers' reports of the frequency with which they asked students to write to monitor learning (model-adjusted means)



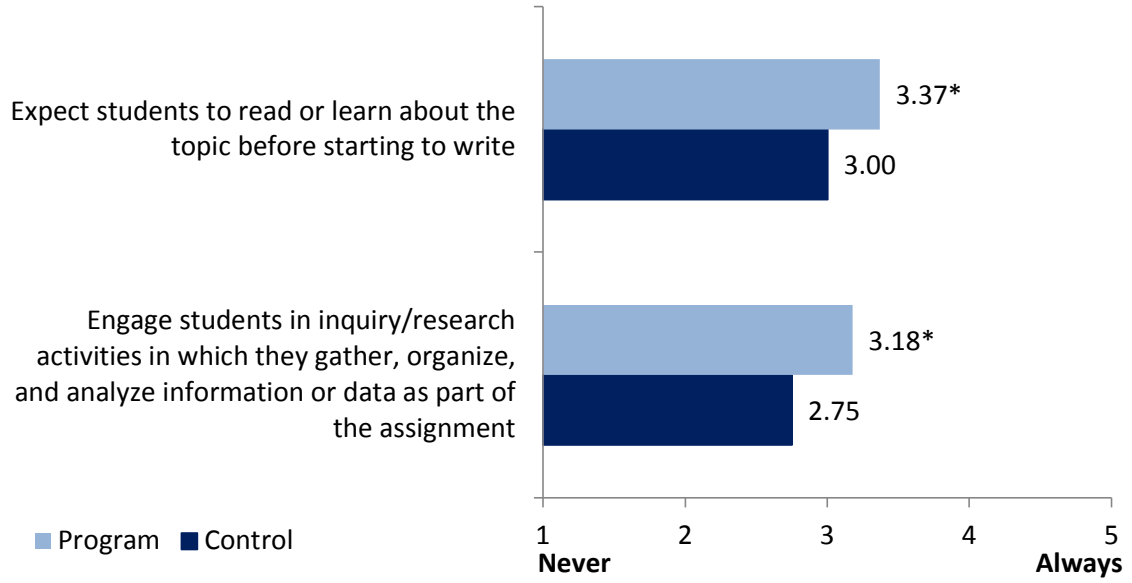
*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

The numbers on the horizontal scale correspond to teachers' ratings of how often students in their classes engaged in the listed writing-related activities. Scale points correspond to the following: 1 = Never, 2 = Several Times a Year, 3 = Monthly, 4 = Several Times a Month, 5 = Weekly, 6 = Several Times a Week, and 7 = Daily.

Source: SEED teacher surveys.

Two additional questions asked teachers about other ways that students used writing as part of a larger learning task. The survey asked teachers how frequently they asked students to read or learn about the topic before beginning to write, or had students engage in inquiry activities that included writing. On a scale from "never" (1) to "always" (5), SEED professional development also had positive impacts on these two aspects of writing to learn (Exhibit 4-11).

Exhibit 4-11. Teachers' reports of the frequency with which they asked students to write as part of larger learning activities (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups*

Scale points correspond to the following: 1 = Never, 2 = Occasionally, 3 = About Half the Time, 4 = Usually, 5 = Always

Source: SEED teacher surveys.

Interview data suggest that teachers more frequently engaged students in writing to learn throughout the day. One principal described the shift she saw in teachers' instruction:

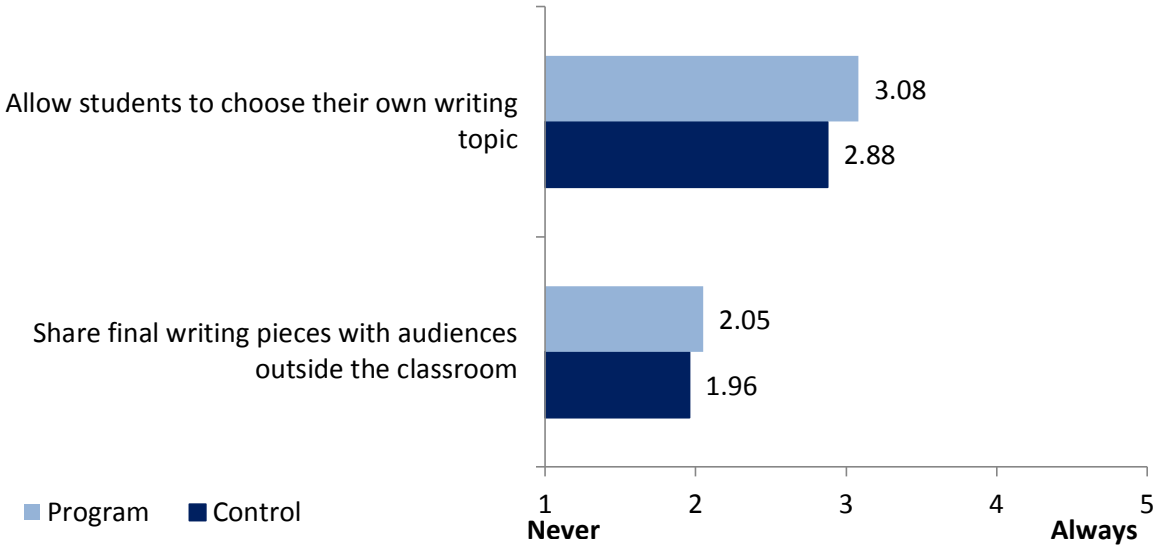
> First thing, I've seen more writing…across the curriculum…and connecting the writing to other areas of the curriculum. For example, instead of…typical worksheets, students have [to use] writing to explain what they understand. They're implementing the exit slip. They're implementing…writing for a variety of purposes rather than just…the typical answering the question.

When teachers described these types of instructional practices, they explained how students' writing helped them process and learn new content. Teacher uptake of activities that support writing to learn may, therefore, partially explain why SEED professional development impacted teachers' reports of time students spent writing but not time teachers reported spending on writing instruction.

There is no evidence that SEED professional development impacted how frequently teachers allowed students to choose their own writing topics or ask students to write for audiences outside of the classroom.

Giving students choices in writing topics and sharing writing with outside audiences are two other ways that teachers can help students have authentic writing experiences in school. Teachers in program schools did not report giving students choice in their writing topics or asking students to share their writing with outside audiences more frequently than teachers in control schools (Exhibit 4-12).

Exhibit 4-12. Frequency with which teachers reported giving students a choice of writing topic or sharing writing with external audiences (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups.*

Scale points correspond to the following: 1 = Never, 2 = Occasionally, 3 = About Half the Time, 4 = Usually, 5 = Always

Source: SEED teacher surveys.

While there were no statistically significant differences between the program and control group on these items, interviews provide examples showing that some teachers who used these strategies understood how they could help engage students in writing. In describing an activity where she gave students a choice of topic one teacher reported,

> We brainstormed ideas. I wrote it on the board, they took notes on it during the brainstorming session, then they got to choose. One of the incentives was that they got to work on [the one] that was their favorite, and we formed groups based on that choice.

Overall, the data suggest that SEED professional development did impact the frequency with which teachers constructed some elements of writing tasks to make them more like writing tasks that people engage in outside of academic settings.

Understanding Shifts in Teacher Practice

Teachers' reports on their instructional practices suggest that SEED impacted some practices that research suggests are critical for teaching elementary students to write. The main focus of SEED professional development was helping teachers learn how to teach argument writing as called for by the CCSS-ELA. The data show SEED professional development had a positive impact on the intended focus areas—for example on providing genre-specific writing instruction and instruction on craft (including the craft of argument writing). To help teachers teach writing effectively, SEED professional development also focused on other core strategies of effective writing instruction (see Chapter 3). These foci also led to impacts on, for example, how much time students spent writing, teachers using writing to learn activities, and teachers engaging students in generative parts of the writing process. The data also suggest that teachers' instructional practices were not transformed across the board, which is not surprising for a 1-year program implemented in schools that were, in many cases, just beginning a larger process of adapting their curriculum to the new requirements of the CCSS-ELA. Some of the deeper shifts in teacher practice that may be necessary to fully meet the CCSS-ELA—for example the amount of writing instruction teachers provide and the frequency with which teachers engage students in revision and editing—were not impacted. The survey and interview data combine to suggest some reasons for the important, yet not universal, changes.

There was substantial variation in the changes teachers within the same school reported making in their practices in response to the professional development.

In examining survey data, we see substantial variation in the changes in teacher-reported practices *within schools*. For survey items that were on the fall and the spring surveys, researchers calculated change in teacher-reported practices from fall to spring and

examined the variation in the fall-to-spring gains for each item to determine the proportion of the variation that was attributable to differences across schools as opposed to differences among teachers within schools.[30] Averaging across all items for program schools, we see that 7% of the variation in changes in teacher-reported instructional practices can be attributed to schools, compared to 93% of the variation being among teachers within schools. If an intervention had a highly similar impact on all teachers within a given school, we would expect a higher proportion of the variation to be at the school, as opposed to teacher, level.

Interviews provide examples of both professional development providers and teachers recognizing that there were differences within schools regarding what teachers took away from the professional development. As one Local Writing Project site's professional development lead explained,

> Some teachers, it's like they are sitting at the edge of their seat and they are soaking up that information and they are going back and doing it right away. Other teachers, I don't see it as much in their classrooms. I can tell you today which ones will teach what they saw today in their room when we come back from spring break and which ones will never touch it.

Similarly, a teacher working with a different Local Writing Project site noted that she really did not know what her colleagues were taking up from the professional development:

> I know some are using [informal writing strategies] more than others. I know some are doing the suggested writing projects, and I'm not sure all of us are…. I'm not trying to say they don't value it. I'm just trying to say it might be in competition with a lot of other things that are going on.

This type of variation in uptake is represented in the evaluation framework, which posited that teachers' prior knowledge, skills, and beliefs mediate the effect of professional development on teachers' practices. Additionally, it is in line with general understandings of change processes, which have found variation within organizations in individuals' responses to calls for change (Fullan, 2001).

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[30] Known as the intraclass correlation coefficient (ICC), this calculation parses out the proportion of variance that is attributable to variation among groups as opposed to the variation of individuals within groups.

For the most part, teachers took model lessons or activities learned through their professional development and tried them in their classroom, but teachers rarely took strategies from lessons and integrated them into their general pedagogical approach.

It is likely impossible to say how long it takes for professional development to change teachers' practice because some practices (e.g., writing a learning objective on the board) are likely easier to change than others (e.g., shifting from traditional to more inquiry-oriented instruction). The data collected in this study shed light on some of the practices that teachers believed they were able to change after 1 year of SEED as well as others that had not yet been consistently impacted. Teachers were frequently able to apply specific lessons or activities in their classrooms. Overall (and not surprisingly), teachers rarely made major shifts in practice, such as moving from a focus on teaching grammar in isolation to implementing writer's workshop or regularly using a wide range of practices to create an engaged community of writers. Several examples illustrate both what teachers reported taking into their practice and also where they thought some limits to changes in instructional practices during the first year of SEED lay.

One teacher showed us student writing and explained that she was able to take a well-developed practice she has been using for years—helping students create a personal narrative for their district's writing portfolio—and was able to tweak aspects of it to put in ideas learned through SEED.

> This is a piece that goes in their portfolios. They're asked to—I mean this is over like a month period of time—to come up with a personal narrative, a story of something true that happened to themselves that has a beginning, middle, and end, and has a problem and some sort of solution. So I've taught this for years and years and years. So I had it set up the way that I normally do it, but I was plugging in some of the things I was seeing from the Writing Project and putting it in with it.

Others talked about the difficulties they faced in implementing some of the bigger ideas from SEED if those required greater shifts in practice. One noted,

> I would say if I looked at a theme [of the SEED professional development], it might be differentiation as far as giving kids choice in what they are writing about.... Not sticking them to one genre…so doing more like writing study

> groups with the students. So we have been introduced to that [through the Writing Project]. [But] I haven't taken off with that yet in the classroom.

Another teacher noted both the challenge and the excitement teachers in her school faced given the difference between the practices they were accustomed to and those presented by the Local Writing Project site. This teacher suggested that more time working with the new ideas would be very beneficial.

> [The site director told us to]…let that apprehension go because you are going to see improvement all across the board if you are letting kids think and write back and forth. So it's kind of been cathartic. But it's also been really hard to have teachers let go of what they are used to. So [the site director] guides us through that. We would like a second year though…because it's such a layered process.... Now it's almost the end of the year, and we are starting actually to feel somewhat confident in what we are doing. But we want another year to really—well, it sort of takes more than a year to perfect it.

A principal from a different school explained part of why it was hard for teachers to make substantial modifications to their instructional practices during the school year:

> Processing time. Time to actually process what you've been shown, what you've been modeled and then to process it, to internalize it, to take this back to my students. I have to plan to do this, this, and this. And just having time to process and plan so it does transfer back into the classroom. And then the school year—there's really not a lot of stopping time where you can take a sabbatical and really prepare that plan or whatever or go and see some other teachers doing that.... So I think [we need more of] the processing and the planning time.

This principal's comments highlight how teachers' instructional context mediated their ability to take up instructional practices they were exposed to through SEED.

Accountability-related testing that teachers did not see as aligned with the SEED professional development made them reluctant to shift their practices.

SEED professional development was implemented in a time of both great change and great accountability for teachers. In most places, tests were not in line with the CCSS, and new teacher evaluation policies increased the pressure on teachers to ensure their students

performed well on tests. The lack of coherence between the old yet continuing tests and policies on the one hand and the new CCSS-ELA, which were not yet tested in most states and districts but with which SEED professional development was designed to support, made some teachers shy away from fully attempting to implement ideas presented through SEED. In fact, some teachers were unwilling to give up practices they believed were critical to ensuring student performance on standardized tests. The pressures from testing played out in different ways for different teachers. For some, the tests made teachers perceive that it was risky to adopt practices promoted in the SEED professional development:

> At the beginning of the year, I remember when we were first talking [in the SEED professional development], and this is just my personal take on it, she was saying, "Don't correct things [e.g., grammatical errors in student writing]. Don't correct things." And I understood that because I liked to take their paper, like I said before, and just take total control of it. But then when we start getting closer to [state test time] probably about December, I am thinking, "OK. They are still not capitalizing the words or they are forgetting to put punctuation." I mean. I can't let these kids just keep going and hope that it will fall out of the sky. So, at this point now, I am like "OK. Take this back. You didn't capitalize the words."… I think [the PD has] been, in my opinion, I could be wrong, it's been more focused on writing in general—which is great—and kind of "don't worry about testing." But it's easy to say when you are not being tested…. When your grade is being tested you can't help but focus on, "Okay, I am teaching writing. But I also know these kids are going to be tested on writing." So not only just getting them to become writers but also the art of taking the test, too.

In other places, the lack of focus on writing in the accountability system meant that writing was not seen as central to the school's work, even though the school volunteered to participate in SEED. One principal explained,

> We don't really have a school improvement goal plan for writing and that's probably because we don't have a writing test anymore in the state…. [We] really didn't focus so much on writing last year because it wasn't tested. So this year it wasn't so much about…an assessment. [It] was more about "Okay, we have professional development. We have folks that are coming from [the university that houses the Local Writing Project site]. They are giving us cool ideas in making writing fun again." And so that's helping us write more…but

> as we get closer to [state testing], a lot of our teachers now are…and myself, we're a little bit anxious.

Another principal noted a similar reluctance to adopt new ideas from SEED professional development in light of weekly common assessments that did not cover writing:

> Say there's a stopping point every week where all kids have to take the weekly common tests and some teachers are thinking, "I haven't taught this" and "I'm not comfortable with where my kids are with this." Do I choose some of the writing now or do I get them ready for the weekly common tests?

The pressures not to teach writing or to only teach specific aspects of writing (e.g., grammar and conventions) typically affected teachers differently based on the grade level taught because if writing was assessed, it was often assessed in only one of the upper elementary grades. While not the only reason for some of the within-school variation in teacher reports on instructional practices, interview data suggest that testing regimes influenced teachers' decisions about what new ideas to try to implement in their classrooms.

Conclusion

SEED had measureable impacts on some teacher attitudes and beliefs as well as teacher instructional practices that are both central to the SEED evaluation framework and have been shown in prior research to be effective in teaching writing to elementary school students. These impacts were mediated by teachers' existing beliefs and practices and their instructional contexts. We turn now to results on the extent to which the direct impacts of SEED on teachers translated to impacts on student writing.

Chapter 5. Impacts on Student Writing

The ultimate goal of SEED is to improve the quality of students' argument writing. The evaluation framework hypothesized that this distal outcome could be attained if the SEED program was implemented with fidelity and, in turn, had positive impacts on teachers' instructional chapter. Chapter 3 presented data showing that the SEED program was generally implemented in accordance with the SEED design principles. Chapter 4 presented evidence that SEED professional development impacted some but not all desired teacher outcomes. This chapter examines whether those changes in teacher outcomes in term led to measureable impacts on student argument writing.

This chapter addresses two main questions:

- To what extent did SEED have an impact on student argument writing after 1 year?
- Are there any teacher instructional practices that are positively related to improvements in student argument writing?

Prior to answering these questions, we describe our measures of student writing.

Measures of Student Writing

In order to estimate the effects of SEED on student writing, SRI administered prompts to all students in third, fourth, and fifth grades in program and control schools in both fall 2012 and spring 2013. The prompts all provided students with about one paragraph of text setting the scene for the prompt. Students were then prompted to write an argument and support their opinion in either an essay or a persuasive letter. For example, one prompt told students that their class was going to get a class pet. It suggested that they consider both the work necessary to care for pets and the possible things students could learn from the pet, and then to write a letter to convince their teacher about the best choice of class pet. In all, SRI administered four pairs of prompts—either essays or persuasive letters—

which were paired fall/spring, so students were prompted to respond with the same type of writing at both points in time.

SRI collected student writings in response to prompts. The National Writing Project organized two scorings where expert scorers trained experienced teachers affiliated with a Local Writing Project site that was not participating in the SEED study how to score the papers using the National Writing Project's Analytic Writing Continuum (AWC). The Analytic Writing Continuum is an assessment system that defines six levels of performance on a holistic measure and six attributes: Content, Structure, Stance, Sentence Fluency, Diction, and Conventions (National Writing Project, n.d.).[31] These six attributes measure aspects of writing that are commonly considered to be important indicators of quality. For example, there are substantial conceptual overlaps between the concepts measured by the Analytic Writing Continuum and those measured on the NAEP writing exam (National Assessment Governing Board, 2010). Based on prior experiences showing that the Analytic Writing Continuum can be used for two grade levels at a time without reaching ceiling effects, third and fourth grade papers were scored together, with fifth grade papers scored separately. Appendix A presents descriptive data on Analytic Writing Continuum scores, correlations among attributes, and interrater agreement data. Primary analyses were conducted using the "AWC average score," created by averaging the scores across all six attributes for each student. Researchers, in consultation with the National Writing Project, selected the AWC average score as the primary outcome measure because the SEED program sought to improve the overall quality of students' argument writing (as opposed to any one particular aspect) and prior research showed a high correlation among the attributes (Bang, 2013).

[31] It is worth noting that because the CCSS-ELA are new, teachers typically had less experience with opinion writing and assessing students' argument writing than they would have had with assessing personal narratives. As a result, the National Writing Project made shifts to the training materials (e.g., selecting anchor and training papers that were exemplars of features of arguments at each score point) and procedures (e.g., a minilesson and discussion focused specifically on grade-level appropriate claims and evidence) to support scorers in applying the AWC to the opinion writing.

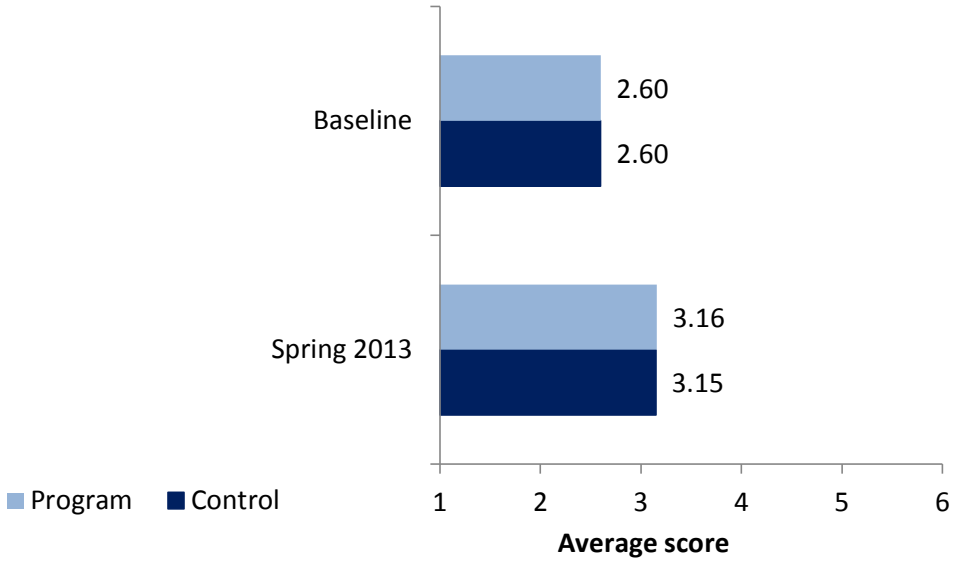
The Impact of SEED on Student Writing After 1 Year

We conducted an intent-to-treat analysis on prompt pairs completed by a random sample of students selected from each third-, fourth-, and fifth-grade teacher regardless of the extent of SEED professional development received by teachers in the program schools. The results can be interpreted as the mean effect on student AWC average scores for third-, fourth-, and fifth-graders caused by attending a school that participated in 1 year of the National Writing Project's SEED grant.

There was no evidence of impact from schools' participation in 1 year of SEED professional development on the quality of student opinion writing in response to an on-demand prompt.

The study did not find any statistically significant differences between students in program and control schools in students' AWC average scores at either baseline or after 1 year of SEED implementation. In fall 2012 (baseline), students in both program and control schools had means of 2.60 on a scale of 1 to 6, on their AWC average scores; in spring 2013, the model-adjusted mean for students' AWC average score in both program and control schools were 3.16 and 3.15, respectively (the difference is not substantively or statistically significant) (Exhibit 5-1).

Exhibit 5-1. Students AWC average scores in fall 2012 and spring 2013 (averaged across third, fourth, and fifth grades) (model-adjusted means)



*Notes: * denotes a statistically significant difference (p < .05) between program and control groups. The original prompt scores are on a 1 to 6 scale with a range of 5.*

Source: Student writing prompts, fall 2012 and spring 2013.

To estimate the impact of being in a program school on student writing, researchers used hierarchical linear modeling (HLM) with treatment status as the predictor of spring 2013 AWC average scores.[32] The impact model predicted students' AWC average score on the spring 2013 writing prompt, controlling for fall 2012 AWC average scores and other indicators that adjust for differences in scores unrelated to the SEED program.[33] The coefficient for the impact of being in a SEED school on the AWC average score was not statistically significant. See Appendix B for full model results.

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32 HLM ensures accurate standard errors in estimating the effect of the SEED program in the presence of clustered data (Raudenbush & Bryk, 2002).

33 To improve precision (i.e., to adjust for differences in student scores related to factors other than the program), the model includes indicators for grade level, school level average fall score, and Local Writing Project site. Both treatment and control schools were assigned a value based on the site that recruited them. Given the distribution of sites across states, this indicator also controlled for variations in state context that might influence student writing. Because there is significant variation in student scores among prompts, researchers grand-mean-centered the prompt scores at the prompt mean at both time points to control for prompt effects.

In addition to an overall impact analysis, SRI researchers conducted exploratory analyses of each grade level separately to see if there were differential effects by grade level. Researchers also conducted exploratory analyses using the holistic score and each separate attribute as dependent variables to examine whether the program had differential effects on different attributes of writing. In addition, researchers ran the analysis based on uncentered scores. In all cases, regardless of grade level or which outcome measure used, the findings were comparable to those described above.

Relating Teacher Practices with Student Outcomes

SRI researchers conducted additional exploratory regression analyses to see if there were any relationships between teachers' instructional practices as described in spring 2013 and changes in student scores from fall to spring on the AWC. These analyses combined information from teachers and students in program and control schools. The results are not causal and do not support any direct inferences about the SEED program. However, they can inform the field by identifying instructional practices that are positively related to improved student writing.

Researchers conducted these analyses on eight dependent variables, each of which was derived from the AWC: AWC average score, holistic score, content, structure, stance, sentence fluency, diction, and conventions. Some instructional practices might be more related to the amount of student growth on particular attributes than others. For example, one could reason that students whose teachers focused more on editing might have higher AWC scores on conventions than students whose teachers focused less on editing. The high correlations among attributes, however, suggest that the results be interpreted cautiously. Conducting multiple, statistical analyses on relatively similar measures is likely to eventually lead to some "false positives," where the actual effect is overestimated. Researchers did not apply formal mathematical corrections (e.g., Bergamini & Hochberg, 1995) to adjust for multiple tests. Instead, because these are exploratory analyses, the unadjusted results come from single-predictor models with the recommendation that readers weigh the evidence as being more suggestive of positive relationships where there is a pattern of positive results as opposed to isolated positive results. The rows of Exhibit 5-2 list the variables from the teacher survey that are positively correlated with student improvement on at least one score on the AWC. The columns list the eight AWC-derived scores. The "+" in the cells identify statistically significant and positive

relationships between teacher instructional practices measured on the spring 2013 survey and changes in students' AWC scores from fall 2012 to spring 2013. This table does not present data on survey items that were not positively related to growth in students' AWC scores. Appendix B presents a table with coefficients and *p*-values for each estimate.

Exhibit 5-2. Teacher reports on instructional practices that are positively related to student writing scores on the AWC

	Holistic	Average of Six Attributes	Content	Structure	Stance	Sentence fluency	Diction	Conventions
Minutes spent by typical student on writing in the classroom	+	+		+	+	+		
Write multiple related paragraphs of less than 2 pages		+				+	+	+
Write over a shorter time frame (i.e., a single sitting or a day or two)				+	+	+		
Revising text (focused on meaning, ideas, and organization)				+				+
Editing text (focused on grammar, usage, punctuation, spelling)						+		+

Source: Student writing prompts, fall 2012 and spring 2013; SEED teacher surveys.

These data suggest that several instructional practices (those related to increased student writing scores on two or more attributes) are promising for improving student writing as measured by the AWC:

- The amount of time teachers reported students spent writing is positively related to improvements in the AWC holistic, average, structure, stance, and sentence fluency scores.
- The frequency teachers reported having students write longer text—specifically, multiple related paragraphs of less than two pages—is positively related to improvements in average AWC score, sentence fluency, diction, and conventions scores.

- The frequency teachers reported having students work on writing over a shorter time frame (i.e., a single sitting or a day or two) is positively related to improvements in AWC scores for structure, stance, and sentence fluency.
- The frequency teachers reported asking students to engage in revising text (focused on meaning, ideas, and organization) is positively related to improvements in AWC scores for structure and conventions.
- The frequency teachers reported asking students to engage in editing text (focused on grammar, usage, punctuation, and spelling) is positively related to AWC scores on sentence fluency and conventions.

The coefficients for these estimates, while positive and statistically significant, are relatively small, ranging from 0.03 to 0.06. These figures can be interpreted as meaning that for every unit increase in the survey item, there is an corresponding increase in AWC score in the amount of the coefficient. For example, the survey item on how frequently teachers ask students to write multiple related paragraphs of two or more pages asked teachers to respond on a scale from "never" (1) to "daily" (7). If the relationship were strictly linear and the scale points were equidistant (neither of which is precisely true), the mean AWC average student score for teachers who reported "weekly" would be 0.04 points higher than the mean AWC average student score for teachers who reported "several times a month," and would be 0.08 points higher than the mean AWC average student score for teachers who reported "monthly."

It is also important to note that these results do not support the inference that practices where researchers did not identify statistically significant relationships with AWC scores are ineffective. In some cases, lack of variation in the predictor variable (as well as other sources of noise such as measurement error) may have inhibited the ability to detect benefits of effective instructional practices.

Conclusion

The data do not show an impact of 1 year of SEED professional development on student opinion writing, as measured by on-demand prompts scored on the AWC. However, data presented in Chapter 4 show that SEED impacted the minutes students spent writing, which was related to some student writing outcomes. It is clear from these data that no

single instructional practice in isolation accounts for a substantial amount of the variation in student spring 2013 performance, even after controlling for baseline. However, these findings, which suggest the benefits of students' opportunities to practice writing—specifically, more extended writing (i.e., multiple connected paragraphs)—and engage in writing processes such as revision (instead of merely composing text and turning the text in to their teacher), corroborate findings from other research to build greater empirical support for these practices.

Implications

This report presents data to support several positive findings about the SEED professional development and its impact on teachers' writing instruction.

First, Local Writing Project sites delivered professional development under SEED with fidelity to broad design principles. The National Writing Project defined five nonnegotiables that specified minimum requirements for the SEED program. These included a focus on the CCSS-ELA as well as structural requirements for the program that are in line with consensus in the field about the features of effective professional development—namely, a sufficient duration, collective participation, a content focus, and multiple delivery strategies to actively engage teachers in learning (see Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Working together with their partner schools' leaders, Local Writing Project site leaders further developed the nonnegotiables when they specified the "common agreements," which identified key program features. Taken together, the nonnegotiables and the common agreements specify the design principles for the SEED program. Local Writing Project sites provided professional development that was consistent with these design principles and was different—more intensive, more focused on opinion writing and implementation of the CCSS-ELA in writing—than the writing professional development that would have been available without the SEED grant.

In turn, participating teachers reported greater knowledge of the CCSS-ELA and more use of many, but not all, of the instructional practices SEED professional development sought to influence than teachers in the control schools. The data show a consistent impact on survey measures related to opinion writing, the primary focus of the common agreements and the professional development. The data also indicate an impact on the extent to which teachers reported using writing as part of larger learning activities (i.e., activities including inquiry or research projects where writing is used as a tool to support students' processing of information or metacognitive self-monitoring). The use of writing and particularly argument writing as part of larger learning opportunities is in-line with the CCSS, which call for increased writing in the disciplines.

However, despite the research-based attributes of the SEED professional development and its influence on program school teachers' instructional practices, SEED professional development did not impact student argument writing as measured by on-demand

prompts scored on the National Writing Project's AWC. Given that the professional development had features that represent the consensus view on effective professional development, differed from professional development the control school teachers participated in, and impacted teacher instructional practices, the lack of evidence of impact on student outcomes raises the question: why not?

To explore this question and put the findings in context, we return to the research on effective writing instruction in elementary schools (as summarized in Graham et al., 2012). Broadly stated, that research has two main findings. First, students need to have regular opportunities to learn to write (about 1 hour per day in elementary schools), and in that time teachers need to both provide instruction that will help students write well and give students time to practice writing. Second, the writing instruction teachers provide needs to be multifaceted—including processes for moving from a vague idea to one that is well developed; an understanding of the craft of writing so that the text is compelling, well organized, has a tone that matches its purpose; and knowledge of appropriate conventions for written language.

While SEED professional development was aligned with instructional practices supported by research, looking across our data on teacher practices, what we found stands in contrast to the writing instruction research suggests students should have. At the most basic level, students did not have access to the opportunities to learn to write that research indicates they need. Teachers in both treatment and control schools dedicated comparable amounts of time to teaching writing and both taught writing substantially less than research suggests they should. And while students in program schools spent more time writing than their peers in control schools, the extent of the difference—20 minutes more of writing per week—may be too small to enable students' writing to improve at a substantially faster rate than it would have without SEED professional development.

Interview data suggest that limited time devoted to writing is partially a legacy of NCLB (and related state and local instructional policies) and the tendency of schools to narrow the curriculum to focus on the most heavily-tested subjects. State English language arts tests have tended to focus on multiple-choice grammar and conventions questions, sometimes on short answer or constructed-response items, and less frequently on extended, nonformulaic writing. To the extent that these tests have informed teachers' conceptions of what students' writing experiences should be, their instruction has been narrower than research recommends. While the CCSS-ELA send different signals about

writing instruction, implementation was in a very early stage and assessments were not yet aligned with the new standards.

Another element of context for this research is the short time frame of the intervention and evaluation. This study is part of a growing collection of rigorous studies of professional development that had features that mark "effective" professional development but that did not find impacts on student outcomes. It seems likely that absent a surrounding context that is highly supportive of teacher learning and change, professional development does not alter instructional practices sufficiently and rapidly enough to impact student outcomes in less than a year.

Based on these key findings and an understanding of the context in which the National Writing Project's SEED program was implemented, we offer implications for state and district policymakers and school leaders, professional development providers, and researchers. We frame our findings within existing research on policy implementation.

State and district policymakers and school leaders. The first wave of standards-based reform was based on a theory that individuals respond to particular policies based on their assessment of how any given policy fits into the broader system of ideas, incentives, and sanctions that shape instruction. As a result, researchers theorized that teachers would be more likely to make shifts that bring their instructional practices in-line with a given policy if the entire system were aligned (Smith & O'Day, 1991).

This research implies that if policymakers hope to see students moving towards the CCSS-ELA in writing, they will need to change the instructional policies and expectations that currently prevent writing from taking a more prominent role in instruction. State policymakers have a role to play because of how state testing can drive instruction. If tests do not assess students' skills at more extended writing, teachers, schools, and districts will not have the support and pressure necessary to ensure that writing is prioritized. District-level instructional guidance that reinforces the notion of teaching disciplines in isolation is another aspect of this problem. Additionally, schools and districts need to provide teachers necessary resources, in terms of time to enhance their own learning and to redesign their instruction, materials, and the space to try out new ideas.

Professional development providers. Many professional development providers will likely design and deliver professional development over the next few years to support teachers in making substantial shifts in practice towards new and rigorous standards (e.g., CCSS, Next Generation Science Standards). The CCSS-ELA in particular set a high bar for writing

instruction: students will write for multiple purposes; use various writing processes in their writing; have the craft skills necessary to develop writing appropriate to task, purpose, and audience; and write routinely as part of broader learning processes over both shorter and more extended time frames. What are the implications of these expectations for professional development providers?

Research on cognition and how it affects teachers' responses to substantially different ideas about instructional practices provides some possible answers. Spillane et al. (2002) reviewed studies of past attempts to use standards to reform teaching to more inquiry-oriented approaches. They suggest that when faced with a new policy designed to change their practice, teachers first develop an understanding of the new policy, then evaluate their own practice in light of the new policy (as they understand it), and then decide if and how to respond based on their context (e.g., resources to support change, incentives, sanctions, etc.). Thus, if teachers do not have a clear and accurate understanding of the practices implied by the new policy, they will not recognize the changes they should make or be able to change their practice in line with these policies. As a result, even if teachers are willing to attempt to change their practice in the abstract, they may not be able to make substantial shifts in practice.

Spillane et al.'s work (2002) suggests that a challenge for professional development providers in the early stages of this reform may be teachers' level of understanding of what instruction aligned with new standards would actually look like. Our survey data indicate that many teachers were not yet confident that they knew how to teach to the CCSS-ELA; the data do not address the additional possibility that some teachers conceptions of instruction aligned with the CCSS-ELA may differ from those intended by the policy. Our interviews corroborated survey findings, suggesting that some teachers in SEED schools were not in a position to make deeper changes in their instructional practices because they did not have a clear picture of what research-based, CCSS-aligned best practices for writing instruction might look like in their context. For example, to the extent that teachers have grown accustomed to prescriptive and formulaic approaches to writing instruction, professional development providers will need to support teachers as they learn to guide students towards taking responsibility for making the decisions that will enable them to communicate most effectively. Professional development providers will need to help teachers envision the destination (i.e., a research-based instructional environment for student writing) as well as the path for moving from their current practices to those that are in line with the CCSS-ELA.

Researchers. Finally, this study has implications for future research. Our data clearly show that the impacts of the SEED program cannot be understood absent data on the context in which it was implemented. Given the constraints for change, we believe it might have been impossible for 45 hours of teacher professional development on writing instruction, on its own, to have measurably impacted student writing in 1 school year. Teachers started in very different places, and the barriers to deep and rapid change were so pervasive, that it is hard to imagine how teacher learning could translate into measurably improved student writing in the course of 1 school year.

One implication is, then, that researchers, including those implementing randomized controlled trials, need to collect data not only on implementation and impact but also on context. In our study, some of the most compelling data on context was qualitative data, which many researchers collect sparsely, if at all, when conducting randomized controlled trials. Through the words of teachers and administrators, for example, we learned how teachers made decisions about which ideas from the professional development to try and which ones to set aside.

* * *

Taken as a whole, this study suggests that multiple stakeholders will need to work in concert to attain the goals that states across the nation have set for elementary students' writing. Supporting teachers to teach to these new standards—and ensuring that students master them—will require a systemic effort. While states have attempted systemic reform for two decades, we do not yet have a coherent system that sends teachers consistent messages about instruction. Moreover, we know from prior research on the implementation of new standards that achieving the CCSS will require truly aligned student assessments, a supportive teacher development system, and local leadership with a real understanding of the work involved. Finally, this study reinforces the important role that professional development can play in helping teachers develop new understandings and make the instructional changes necessary to achieve the new standards.

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Appendix A: Research Methods

The evaluation of the SEED professional development had two aims. First (1) to describe the implementation of the professional development, and (2) to estimate the impact of the professional development on third-, fourth-, and fifth-grade teachers' practices in writing instruction and on students' argument writing. SRI International employed an experimental design to estimate the impact of the professional development and collected qualitative and quantitative data to study implementation. Because states recently adopted the CCSS-ELA, professional development specifically aligned to the CCSS-ELA is an emerging area for Local Writing Project sites. As a result, SRI and the National Writing Project decided to conduct the RCT as an efficacy study.

The study drew on four main sources of data—on-demand student writing prompts, teacher surveys, interviews and site visits, and professional development monitoring forms. This appendix first describes data collection and then the methods used for quantitative analysis. Details on sample recruitment, eligibility, and interviews and site visits can be found in the body of the report.

Data Collection Methods

This section opens by describing the role of the Local Site Research Coordinator in supporting quantitative data collection. Subsequently, it describes the data collection instruments, procedures, and analytic samples for the on-demand student writing prompts, teacher surveys and professional development monitoring.

Local site research coordinator

Participating schools were spread across 12 states and, as a result, the core research team needed to identify local research assistants, known as Local Sire Research Coordinators (LSRC) to support prompt administration and survey follow-up. LSRCs' role included

orienting the teachers to the study and data collection activities, serving as an initial resource for teachers about data collection, assisting with prompt and survey administration, and following up with teachers regarding late or incomplete data. While Local Writing Project sites recruited LSRCs, a member of the SRI research team provided training for all LSRCs, and SRI researchers maintained regular contact and served as a resource for the LSRCs. To ensure separation between research and the professional development at each Local Writing Project site, SRI trained both LSRCs and site staff in how to maintain a firewall between professional developers and LSRCs. LSRCs were not to plan, participate in, or present any professional development to teachers in the partnership schools; conversely, Local Writing Project staff involved in providing professional development were not allowed to participate data collection and had to refer any queries about the research to the LSRCs. For their services, LSRCs received a stipend of $2,000 to $4,000 depending on the number of school pairs they supported.

On-demand writing prompts

To measure the impact of the SEED professional development on writing performance, SRI administered on-demand writing prompts to third-, fourth-, and fifth-grade students in eligible classes across all program and control schools in fall 2012 and spring 2013.[34] A teacher's classroom was deemed eligible as long as it did not have over 50% students with special needs.

Prompt development and administration

The National Writing Project developed six pairs of prompts for the evaluation and pilot tested each of these prompts with students in third, fourth, and fifth grade to assess student understanding, interest, writing quality, and length of response. Each prompt in a pair had a similar form (i.e., were between 82 and 112 words and prompted students to write an argument) to allow for comparability from fall to spring but differed in specific

[34] Researchers overlooked one classroom during the fall 2012 prompt administration. Additionally, another teacher left a different school part of the way through the year and the students were distributed among the remaining teachers in the grade level. Researchers did not successfully administer the prompts to the dispersed students.

topic. SRI chose four pairs of prompts from six pairs developed by the National Writing Project for this evaluation.

In fall 2012, SRI fielded prompts in all 44 program and control schools; in spring 2013, SRI administered prompts in the 42 program and control schools remaining in the study. To support teachers in the administration of the prompts, LSRCs conducted a training for all teachers prior to fielding the prompts, scheduled dates for administration, and were present at schools sites on the day of prompt administration.

Prior research shows that structure, wording, and presentation of prompts can affect student responses in ways that are not easily predicted (Huot ,1990; Quellmalz, Capell, and Chou, 1982). To mitigate the possibility that student performance may reflect characteristics of the prompt rather than student writing ability, SRI counterbalanced prompts for fall and spring administration. The prompts were labeled A-H, such that each was matched to create a prompt pair. Prompt A was matched to prompt E, prompt B matched to prompt F, C to G and D to H. Each set of prompts was used in both the fall and spring administration. SRI randomly assigned each classroom teacher either the first set (A-D) or second set (E-H) of prompts in the fall. In the fall, teachers were instructed to randomly distribute their four assigned prompt types (A-D or E-H) across the students in the class as evenly as possible, making note of which student had which prompt. Depending on which prompt students received in the fall, SRI assigned students to matching prompts for the spring administration. SRI provided teachers with extra spring prompts to distribute to new students who joined the class after the fall writing prompt administration.

SRI selected a stratified random sample of 10 fall/spring pairs of student responses to prompts from each of the 397 target classes. Across experimental conditions, researchers evened out the distribution such that, to the extent possible, there were equal numbers of prompt types across program and control schools. This sampling method necessarily excluded students who left or joined the target class between the fall and spring prompt administrations. This limits the generalizability of findings to those students who remained in school for the entire year. However, it does not bias the findings because the pre- and post-tests were administered within the same school year, randomization was at the school level (increasing the barrier for leaving either treatment condition), and students do not typically move between schools within a year. These factors make it all but impossible for any attrition to be endogenous to treatment status.

In a small number of classrooms, SRI was unable to select enough viable prompt pairs for scoring due to student mobility or students submitting unscorable responses (e.g., blank, written in a language other than English). The final sample included eight or more prompt pairs from over 97% of teachers and a full set of 10 pairs from over 77% of teachers administering prompts (Exhibit A-1). The most common reasons that SRI obtained fewer than 10 prompt pairs were students writing in a language other than English and student turnover. A total of 3,835 prompt pairs were scored and included in the final analytic sample for impact analyses.

Exhibit A-1
Student writing prompt analytic sample – student impact analysis

	Program	Control	Total
Classrooms in the analytic sample	181	216	397
Classrooms with at least 8 prompts pairs	179 (99%)	207 (96%)	386 (97%)
Classrooms with at least 10 prompt pairs	143 (79%)	162 (75%)	305 (77%)
Student writing prompts	1,755	2,080	3,835

Note: Classrooms refers to homeroom classrooms for students. In one state, elementary schools were departmentalized and so multiple homeroom classrooms received ELA instruction from a single teacher.

Source: SEED student writing prompts

Scoring on-demand writing prompts

Scoring of sampled student responses to the on-demand writing prompts occurred in two sessions in summer and fall 2013. Student responses to the prompts were scored using the National Writing Project's Analytic Writing Continuum (AWC) rubric (National Writing Project, n.d). The AWC has been shown to have high reliability across multiple past scoring National Writing Project scoring events (Bang, 2013). The National Writing Project led the scoring sessions, monitored by a senior member of the SRI research team. Scorers applied the AWC for assessing six different attributes of student writing—content, structure, stance, sentence fluency, diction, and conventions—and a holistic writing rubric for judging overall quality of the writing on a six-point scale. To ensure that teachers did not align their instruction to the outcome measure, no one in either program or control schools had access to the AWC rubrics or scoring system. To support scorers in using the AWC reliably, in February 2013 the National Writing Project convened an expert panel of writing

assessment experts, most of whom were not employees of the National Writing Project, to select anchor papers for each score point and commentary that described the rationale for assigning each anchor paper the scores it received. Additional detail on the preparation of papers, recruiting and training of scorers and scoring process is provided below.

Preparing papers. To prepare the sampled students' responses to the writing prompts, SRI redacted all identifying information and tagged prompts with a unique ID. To de-identify the student writing, SRI removed information about time of administration, experimental condition, school, teacher and student name, and also any information in the students' text that might identify the students' location.[35] Additionally, SRI tagged each writing sample with an individual ID system using a format created by the National Writing Project to facilitate moving of papers accurately through the scoring process (e.g., the ID contained information used to ensure that student papers that were randomly sampled by SRI for double-scoring got double-scored). The use of two ID systems ensured that neither scorers for National Writing Project staff had access to information about which writing samples were drawn from treatment versus control classrooms. SRI used a cross-walk file to link each paper's scoring ID to the more detailed ID that SRI used for tracking and analysis.

Recruiting and training scorers. The NWP recruited teachers affiliated with Local Writing Project sites and with expertise in upper elementary writing instruction from sites not participating in SEED to score the student writing. All scorers had experience teaching either in the grade level or an adjacent grade to the grade levels they were scoring. This recruitment strategy ensured that teachers were knowledgeable about grade-level appropriate expectations for writing development. Where possible, the NWP recruited scorers with previous scoring experience. Approximately one-third of scorers had previously scored papers using the AWC. However, the emphasis on narrative writing in the curriculum especially at the elementary grades meant scorers generally had limited experience scoring opinion writing. Thus many scorers encountered both a new scoring system and a less familiar type of writing to score.

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[35] For example, one prompt asked students to recommend a local business for a field trip where students were to learn about jobs in the community. If a student wrote a piece suggesting a visit to the San Francisco Zoo to learn about zookeepers, the name of the zoo would have been removed.

Leaders from the National Writing Project led the scorer training. They provided an initial training to table leaders, who had prior experience using the Analytic Writing Continuum (AWC). In the initial training, leaders reviewed the scoring rubrics and walked through a set of grade-level specific anchor sets and training papers (selected from the sample of papers collected by the SEED evaluation but not sampled for scoring). In addition to its focus on the AWC, the training covered the logistics of scoring.

The NWP leaders then trained the larger group of scorers with support from the table leaders. For training scorers separated into a 3rd/4th grade room and a 5th grade room in order to calibrate scoring to grade-level appropriate standards. The training focused on the interpretation and application of the scoring rubrics. Scorers had extended time to practice scoring sample papers selected by the trainer prior to the actual scoring.

Conducting the scoring sessions. Student responses to writing prompts collected in both fall 2012 and spring 2013 prompt administrations were scored together. Student papers were scored at two sessions, one during summer 2013 (where all 3rd and 4th grade papers and a portion of the 5th grade papers were scored) and a second session during October 2013 (convened to complete the scoring of 5th grade papers and to re-score papers from 5th grade scorers who demonstrated low reliability).[36]

At each scoring, research staff distributed writing samples from the different Local Writing Project sites randomly across the scoring tables. The de-identification described earlier ensured scorers were "blind" to the home district and school of each paper, the school's experimental condition, and the timing of prompt administration. Following every major break (e.g., overnight, after meals), all scorers recalibrated using practice sample papers before operational scoring resumed. Table leaders "read behind" scorers at their tables during the actual scoring session, monitoring individual scorers' application of the rubrics and consulting with or retraining scorers when warranted. For the 15% of double-scored papers, if two raters assigned scores that were one point apart, the scores were averaged. If the raters assigned scores that were two points apart, a table leader adjudicated the scoring by independently scoring the paper; the leader's score was assigned to the paper.

[36] Scorers for this second session were recruited from among those participating in the summer scoring who had been found to have high reliability.

Establishment of interrater reliability. Reliability of the prompt scoring was assessed separately for each writing attribute measure in the AWC, as well as the holistic writing measure. SRI randomly selected approximately 15% of the papers within each grade span (3rd/4th and 5th) to be double scored. Exhibit A-2 shows the final agreement rates for agreement within one scale point for each measure among the double-scored papers. These reliabilities therefore provide estimates of the reliability of the 85% of writing not double-scored. The rates for agreement within one scale point ranged from 95% (5th grade conventions) to 85% (5th grade stance).

Exhibit A-2
Agreement rates for the scoring of student writing prompt papers

	Agreement within one scale point	
	3rd / 4th grade	5th grade
Holistic	92%	88%
(agreements/total possible agreements)	(739/804)	(349/396)
Content	91%	86%
(agreements/total possible agreements)	(729/804)	(341/396)
Structure	92%	89%
(agreements/total possible agreements)	(742/804)	(353/396)
Stance	89%	85%
(agreements/total possible agreements)	(719/804)	(336/396)
Sentence fluency	89%	89%
(agreements/total possible agreements)	(718/804)	(351/396)
Diction	90%	89%
(agreements/total possible agreements)	(724/804)	(353/396)
Conventions	91%	95%
(agreements/total possible agreements)	(732/804)	(376/396)

Teacher Survey

SRI administered surveys to third-, fourth-, and fifth-grade teachers across program and control schools in fall 2012 and spring 2013. Teachers eligible for the survey included all third-, fourth-, and fifth-grade classroom teachers.

The fall survey collected baseline information on teachers' knowledge, beliefs, and attitudes related to writing instruction and on teachers' instructional practices in writing and asked about prior professional development in writing. The spring survey asked the same questions about teachers' knowledge, beliefs, attitudes, and practices, allowing researchers to examine program impacts on teacher outcomes adjusting for baseline. In addition, the spring survey included questions about exposure to writing professional development.

To develop the survey instrument, SRI researchers identified key constructs in the evaluation framework and drafted aligned survey items. Where appropriate and available, researchers adapted survey items from existing survey instruments.[37] National Writing Project staff reviewed multiple drafts of the survey. SRI researchers pilot tested the survey with upper elementary grade teachers for readability, understanding, and length. Researchers adjusted survey items based on their feedback.

SRI administered the survey online using Snap survey. Each teacher received a unique survey link, which allowed researchers to track response rates, follow-up with non-respondents, and link fall and spring surveys over time. Table A-3 shows the fall and spring response rates. Excluding the pair of schools that attrited from the study, SRI administered the survey to 380 teachers in the fall and 378 teachers in the spring.

Exhibit A-3
Teacher survey response rates

	Fall 2012		Spring 2013	
	Program	Control	Program	Control
Teachers receiving a survey	173	207	172	206
Respondents	159	187	152	179
Response rate	92%	90%	88%	87%

Notes: Fall response rate excludes teachers from attrited schools.
Source: Fall 2012 teacher survey; spring 2013 teacher survey.

Analyses of the SEED professional development and teacher outcomes were based on responses to the spring survey. To be eligible for inclusion in the analytic sample for those analyses, teachers needed to be at the school for the majority of the year so that they could reasonably represent professional development experiences and teacher instructional practices during the 2012–13 school year. In the fall 2012, SRI identified 380 third-, fourth-, and fifth- grade teachers as eligible for the survey. Eight teachers present for the fall survey

[37] In developing the survey, the SRI team drew on surveys created for a previous SRI evaluation of Writing Project professional development (National Evaluation of Writing Project School Partnerships), surveys of elementary writing instruction developed by Steve Graham, and the Consortium for Chicago School Research 2011 Teacher Survey.

subsequently left their positions and attrited from our sample. Two of the eight were replaced prior to November 1. The analytic sample includes these two new teachers. The five teachers who were hired after November 1 who took our spring survey were not included in the analytic sample. The resulting analytic sample contained 326 teachers.

For the analyses of teacher outcomes presented in chapter 4, researchers included a covariate adjusting for prior practice as reported on the fall survey. When teachers had not completed a fall survey, or when they were unable to report on their prior practice on the fall survey (because they were new to teaching these grade levels in the school) models used a school-level aggregated measure of prior practice. Researchers computed the school-level aggregate measures using data from just those teachers in the spring analytic sample who had also responded to the teacher practice questions on the fall survey. The third row of Exhibit A-4 reports the number of teachers used to calculate school average baseline practices.

Exhibit A-4 shows the number of eligible teachers surveyed, the number of those on faculty prior to November 1, 2012, the number and percentage of respondents, the final number of teachers in the analytic sample, and the number and percentage of teachers in the final spring sample who contributed to the measure on prior instructional practice. The survey data presented in the body of the report are restricted to the analytic sample.

Exhibit A-4
Teacher survey analytic sample

	Program	Control	Total
Teachers receiving a survey spring 2013	172	206	378
Teachers receiving a spring 2013 on faculty prior to November 1, 2012	170	203	373
Spring survey respondents in the final spring analytic sample	150 (88%)	176 (87%)	326
Teachers in final spring sample who contributed data on prior instructional practice via the fall survey	117 (78%)	129 (73%)	246

Source: SEED teacher surveys.

SRI also conducted a correlation analysis, which looked at the relationship between student outcomes and teacher instructional practices. The analysis only included teachers who

were in the analytic sample and responded to items on instructional practice in spring 2013 (Exhibit A-5).[38]

Exhibit A-5
Teacher survey – correlation analysis

	Program	Control	Total
Teachers with any teacher practice item	149	174	323
Prompts associated with any teacher practice item	1,443	1,670	3113

Source: SEED teacher surveys. SEED student writing prompts.

Professional Development Monitoring

To systematically gather data on the frequency, format, and content focus of the SEED professional development and to track teacher participation in these events, SRI collected data directly from each Local Writing Project site through professional development monitoring (PDM) forms. The PDM forms served as the data source for tracking hours of exposure to the SEED professional development and assessing whether Local Writing Projects and schools met the required 45 hours of professional development for 75% of third-, fourth-, and fifth- grade teachers. For this study, a contact hour was defined as the actual time an individual teacher spends in professional development with site directors and/or teacher consultants. This did not include time spent writing e-mails or viewing online content, although attendance at online events bounded in time (e.g., a Webinar) counted towards contact hours. The PDM forms asked sites to provide the number of contact hours per professional development event for each attendee.

The PDM forms also provided descriptive information on the nature of the SEED professional development. On the forms Local Writing Project sites to listed each professional development activity conducted with their program school(s), and for each event listed the event's primary focus (e.g., strategies for analyzing student work), format

[38] Three teachers responded to the survey but skipped items on instructional practice, so their responses were included in some analyses (e.g., those reporting on the professional development) but not in the correlational analyses.

(e.g., coaching or workshop), and length. In addition, the PDM forms included space for sites to write about the event's goals, activities (including any online components), materials, and any preparation participants were required to do as part of each event.

During the summer of 2012, SRI held a training session for Local Writing Project site personnel who would be responsible for filling out the PDM forms. During the orientation, SRI representatives reviewed how to fill out the forms, with a special focus on the definitions of the terms used in the PDM forms. An SRI staff member gave anyone who was not able to participate in the session a one-on-one orientation.

SRI asked Local Writing Project sites to submit three sets of PDM forms over the course of the evaluation to capture professional development offered in summer 2012, fall 2012, and winter/spring 2013. SRI staff carefully tracked the documents and materials submitted for each school and followed a quality control process with each set of forms. First, SRI researchers reviewed the PDM forms and identified inconsistencies or missing data. If there questions arose about the data, a researcher contacted Local Writing Project site staff and/or posed clarifying questions for site visitors. Site visitors then checked the PDM forms for alignment with their knowledge of the professional development from case study interviews. If necessary, researchers contacted the Local Writing Project site director to address any remaining questions. Following the quality control review of PDM forms from all sites, a researcher created a file across all sites and schools that aggregated PDM forms to calculate total professional development hours. SRI used this data to calculate the percentage of teachers participating in at least 45 and 40 hours of the SEED professional development.

Methods for Analyzing Quantitative Data

This section describes the analytic methods used for descriptive analyses and testing of baseline equivalence, the impact analyses, and correlational analyses.

Descriptive analysis and testing the baseline equivalence

SRI conducted descriptive analysis on baseline teacher practices and student writing scores, and measures on professional development that teachers receive during the intervention year. Because of the nested nature of the data (e.g., teachers nested within

schools), researchers used hierarchical modeling to obtain descriptive statistics and to test the differences between program and control schools on each measure. To obtain the average value on each measure for program and control schools, researchers posited a simple hierarchical model with no predictors for program and control schools separately. Researchers posited a hierarchical linear model for continuous variables and a hierarchical model with a logit link function for dichotomous variables with "yes" and "no" answers or where a scale was collapsed into two categories. The estimated intercept represents the average value of the program or control schools on the measure, taking the nesting of teachers/students within schools into consideration. For dichotomous items, the intercept from the logit link function is in logits, which researchers transformed to percentages for interpretation.

To test the statistical significance of the difference between program and control schools on each measure, researchers posited a hierarchical model with program participation as a predictor at the school level for all schools included in the study. The *p* value for the program identification, which is presented in the tables, corresponds to tests of the significance of the difference between individuals in program and control schools. The general model for testing the difference is:

$$Variable = b_0 + b_1 Program + + e + r$$

The coefficient of the program identification, b1, indicates the difference between teachers/students in program and control schools. The terms e and r are random error terms at the teacher/student and school levels, respectively.

The impact of being randomly assigned to programs

The purpose of implementing a randomized controlled trial is to generate an unbiased estimate of the impact of an intervention on specific outcomes. By including all schools randomly assigned to the treatment and control groups in the analysis, an intent-to-treat analysis provides an unbiased estimate of the effects of random assignment on the outcomes of interest (regardless of the level of implementation of the intervention). If implementation fidelity is high, the intent-to-treat analysis also provides an unbiased estimate of the impact of the intervention.

Teacher outcomes

Because of the nested nature of the data (teachers nested within schools), researchers applied hierarchical modeling to test whether assignment to the program condition impacted teacher outcomes. For each outcome indicator, a two-level hierarchical model with teacher and school levels was posited, with the outcome at the teacher level and program identification as a predictor at the school level. Researchers adjusted for the baseline outcome and baseline school average of the outcome indicator. Researchers also included site indicators in the model to control for site effects. For teachers who were not surveyed in the fall, the model included a dummy variable for the missing baseline outcome measure – researchers imputed the value as 0 and added an indicator in the model indicating the missingness. The coefficient of the program identification indicates the effect of program on the teacher outcome. A hierarchical linear model was posited for continuous variables, and a hierarchical model with logit link function was used for dichotomous variables with "yes" and "no" answers. The general model is:

$$Outcome = b_0 + b_1 Partnership + b_2 Basline\ Outcome + b_2 \overline{Baseline\ Outcome} + b_k kth\ Site\ Indicator + e + r$$

The line above the words "baseline outcomes" (and similar lines above words in subsequent models) indicates the mean, in this case the school-level average of the baseline outcomes. The terms e and r are random error terms at the teacher and school levels, respectively.

Student outcomes

Because of the nested nature of the data (students nested within schools), researchers applied hierarchical modeling to test whether assignment to the program condition impacted student scores on the writing prompts. For each outcome indicator, a two-level hierarchical linear model with student and school levels was posited, with the outcome at the student level and program identification as a predictor at the school level. Researchers made adjustments for the baseline outcome and student grade level. The model also included site indicators to control for site effect. The coefficient of the program identification indicates the effect of program on the student writing outcome. The general model is:

$$Outcome = b_0 + b_1 Partnership + b_2 Basline\ Outcome + b_l lth\ Grade\ Level + b_k kth\ Site\ Indicator + e + r$$

The terms e and r are random error terms at the student and school levels, respectively.

Correlational analyses: The relationship between teacher instructional practices and student writing

Researchers took teacher practice indicators from the spring survey and correlated each of them with student scores for writing prompts among program and control schools. For each outcome indicator and each teacher practice indicator, a three-level hierarchical linear model with student, teacher and school levels was posited, with the outcome at the student level and the teacher practice as a predictor at the teacher level. Researchers made adjustments for the baseline outcome and student grade level. The general model is:

$$Outcome = b_0 + b_1 Teacher\ Practice + b_2 Basline\ Outcome + b_l lth\ Grade\ Level + e + r + u$$

The terms e, r, and u are random error terms at the student, teacher, and school levels, respectively.

Appendix B: Technical Appendix

This appendix provides detailed data to support analyses presented in the main body of the report. Information for all measures where inferential statistics are used to describe implementation or baseline practices, the results of the full, covariate-adjusted models for teacher and student outcomes analyses, as well as the correlational analyses relating teacher practices to student outcomes are presented. Additionally, this appendix presents descriptive information and reliability for teacher survey outcome scales, intraclass correlation coefficient calculations for gain in teacher practice survey items, and detail on selected descriptive data presented in the report.

The information is organized by report chapter. The first section provides information for all teacher survey items used to describe program implementation in Chapter 3. The next section presents supporting detail for the teacher practice survey data found in Chapter 4. Finally, information to support student outcomes analyses in Chapter 5 is presented.

Chapter 3 - Professional Development

This section presents further documentation supporting exhibits and text in Chapter 3. Each table presents the percentage/average rating on the measure, logodds for the percentage, where applicable, and the standard error of the logodds/rating estimated from the hierarchical models as described in Appendix A, the number of respondents included in the analysis, as well as the p values corresponding to tests of the significance of the difference between individuals in program and control schools, where applicable. For dichotomous items, the intercept from the logit link function is in logits, which we transformed to percentages for interpretation. The data below are from the spring 2013 teacher survey.

Exhibit B-1 presents data on the hours of writing professional development teachers received. It corresponds to Exhibit 3-2.

Exhibit B-1
Teachers' reports on the hours of writing professional development they participated in since the conclusion of the last school year (including summer 2012)

	Program	Control	*p*-Value
Hours of writing professional development	61.13	8.32	<.01
	(18.26)	(1.67)	
	n = 138	*n* = 164	

Note: Standard errors are in parentheses.
Source: SEED teacher surveys.

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Exhibits B-2 through B-8 presents information on the nature of teachers' writing professional development. Only teachers who reported participating in at least 1 hour of professional development in writing received these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported participating in at least 1 hour of writing professional development. Exhibit B-3 presents information

Exhibits B-2 presents data on the frequency with which teachers identified the use of various professional development strategies. It corresponds to Exhibit 3-3.

Exhibit B-2
Frequency with which teachers identified the use of various professional development strategies, among those who participated in writing professional development

	Program	Control	*p*-Value
I observed a classroom demonstration by a professional development provider where students were present	94% 2.84 (0.41) *n* = 135	15% -1.70 (0.30) *n* = 84	<.01
I read and discussed professional literature and research	91% 2.26 (0.33) *n* = 135	54% 0.14 (0.23) *n* = 84	<.01
I tried out an idea from the professional development in my classroom and discussed the attempt at a subsequent professional development event	92% 2.49 (0.36) *n* = 135	25% -1.10 (0.38) *n* = 84	<.01
I wrote in response to a writing task that I would use with my students	81% 1.47 (0.24) *n* = 135	21% -1.31 (0.28) *n* = 84	<.01
I examined student work with other teachers in order to plan for instruction or refine my practice	85% 1.77 (0.35) *n* = 135	26% -1.03 (0.26) *n* = 84	<.01
I wrote argument/opinion text	71% 0.89 (0.32) *n* = 135	12% -1.97 (0.38) *n* = 84	<.01

Exhibit B-2
Frequency with which teachers identified the use of various professional development strategies, among those who participated in writing professional development (continued)

	Program	Control	*p*-Value
I developed or revised curricula, lesson plans, or assignments collaboratively with other professional development participants	75%	15%	<.01
	1.09	-1.70	
	(0.25)	(0.34)	
	n = 135	*n* = 84	
My teaching was observed by a professional development provider(s) and I received feedback	31%	7%	<.01
	-0.79	-2.56	
	(0.36)	(0.42)	
	n = 135	*n* = 84	

Note: Standard errors are in parentheses. Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Exhibit B-3 presents data on the frequency with which teachers identified a CCSS-ELA foci of professional development. It corresponds to Exhibit 3-4.

Exhibit B-3
Frequency with which teachers identified a CCSS-ELA foci of professional development, among those who participated in professional development on the CCSS-ELA

	Program	Control	*p*-Value
An introductory overview describing the CCSS-ELA	83%	88%	.34
	1.55	1.95	
	(0.28)	(0.32)	
	n = 119	*n* = 88	
A crosswalk of my state's current standards and the CCSS-ELA (e.g., training highlighting similarities and differences between standards)	64%	61%	.68
	0.58	0.46	
	(0.26)	(0.22)	
	n = 119	*n* = 88	
Professional development on the shifts in instructional practice that are called for in the CCSS-ELA related to writing	52%	43%	.27
	0.07	-0.29	
	(0.24)	(0.24)	
	n = 119	*n* = 88	
Professional development that provided lessons to teach opinion/argument writing	68%	9%	<.01
	0.77	-2.26	
	(0.31)	(0.48)	
	n = 119	*n* = 88	
Professional development that provided lessons (or other specific guidance) to teach to the CCSS-ELA related to writing	55%	24%	<.01
	0.19	-1.18	
	(0.25)	(0.28)	
	n = 119	*n* = 88	

Note: Standard errors are in parentheses. Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Exhibit B-4 presents data on the frequency with which teachers reported improving students' skills in forming and writing argument, developing information writing and developing narrative writing as a focus of professional development. It corresponds to Exhibit 3-5.

Exhibit B-4
Teachers' reports on the focus of professional development (means), among those who participated in writing professional development

	Program	Control	*p*-Value
Improving students' skills in forming and writing an opinion or argument	2.88	1.92	<.01
	(0.05)	(0.08)	
	n = 134	*n* = 86	
Improving students' skills in developing informational writing	2.28	2.03	.06
	(0.09)	(0.09)	
	n = 134	*n* = 87	
Improving students' skills in developing narrative writing	2.12	2.14	.82
	(0.09)	(0.08)	
	n = 135	*n* = 87	

Note: Standard errors are in parentheses. Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Exhibit B-5 presents data on the frequency with which teachers reported using models and qualities of effective writing in professional development as a focus of professional development. It corresponds to Exhibit 3-6.

Exhibit B-5
Teachers' reports on the focus on using models and qualities of effective writing in professional development (means), among those who participated in writing professional development

	Program	Control	*p*-Value
Using models (e.g., mentor texts) in teaching writing	2.72	2.00	<.01
	(0.05)	(0.10)	
	n = 132	*n* = 87	
Qualities of effective writing (e.g., structuring effective sentences and paragraphs, using appropriate conventions, writing strong conclusions, word choice)	2.47	2.11	<.01
	(0.07)	(0.10)	
	n = 133	*n* = 85	

Note: Standard errors are in parentheses.Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Exhibit B-6 presents data on the frequency with which teachers reported building community, drawing on students' experiences, and developing teachers as writers as a focus of professional development. It corresponds to Exhibit 3-7.

Exhibit B-6
Teachers' reports on the focus on building community, drawing on students' experiences, and developing teachers as writers in professional development (means), among those who participated in writing professional development

	Program	Control	*p*-Value
Building a community of writers in my classroom	2.60	2.03	<.01
	(0.08)	(0.11)	
	n = 132	*n* = 87	
Strategies to help students draw on their own experiences in writing	2.49	2.00	<.01
	(0.08)	(0.11)	
	n = 132	*n* = 85	
Developing my own experience and skill as a writer	2.34	1.65	<.01
	(0.09)	(0.09)	
	n = 133	*n* = 85	

Note: Standard errors are in parentheses.Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Exhibit B-7 presents data on the frequency with which teachers identified writing to learn and monitor learning as a focus of professional development. It corresponds to Exhibit 3-8.

Exhibit B-7
Teachers' reports on the focus on writing to learn and monitor learning in professional development (means), among those who participated in writing professional development

	Program	Control	*p*-Value
Using writing to help students learn content in subjects like social studies, science, and math	2.30 (0.09) *n* = 133	2.02 (0.10) *n* = 88	.04
Using writing to help students to monitor or keep track of learning (e.g., learning logs, but not copying from the textbook nor from the board)	2.08 (0.09) *n* = 133	1.75 (0.09) *n* = 86	.02

Note: Standard errors are in parentheses.Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Exhibit B-8 presents data on the frequency with which teachers identified writing processes as a focus of professional development. It corresponds to Exhibit 3-9.

Exhibit B-8
Teachers' reports on the focus on writing processes in professional development (means), among those who participated in writing professional development

	Program	Control	*p*-Value
Improving students' skills and knowledge of planning and prewriting strategies	2.44 (0.05) *n* = 135	2.04 (0.09) *n* = 88	<.01
Improving students' skills in drafting text	2.24 (0.06) *n* = 135	1.97 (0.09) *n* = 85	.01
Improving students' skills in revising text	2.19 (0.08) *n* = 133	2.03 (0.09) *n* = 87	.18
Improving students' skills in editing text	1.93 (0.08) *n* = 135	2.03 (0.10) *n* = 87	.47

Note: Standard errors are in parentheses. Only teachers who reported participating in at least one hour of professional development in writing responded to these questions. A total of 136 teachers in the program group and 92 teachers in the control group reported receiving at least one hour of writing professional development.

Source: SEED teacher surveys.

Chapter 4 - Teacher Outcomes

The data presented in this section provide further documentation for the survey data in the teacher outcomes chapter. Additional detail on the baseline teacher practice contrasts, descriptive teacher practice data and teacher practice impact measures are presented. Additionally, reliability for teacher survey outcome scales and intraclass correlation coefficient calculations for teacher survey items are provided.

Baseline Measures

This section presents baseline equivalence testing estimated from a two-level hierarchical model with teacher and school levels. The detailed models for the analyses are discussed in Appendix A. Each table below presents the percentage/average rating on the measure, , logodds for the percentage, where applicable, and the standard error of the logodds/rating estimated from the hierarchical models, the number of respondents included in the analysis, as well as the p values corresponding to tests of the significance of the difference between teachers in program and control schools, where applicable. The data below is from fall 2012.

Exhibit B-9 presents data on the baseline equivalence of selected fall teacher survey items for spring survey respondents. It corresponds to data on page 53.

Exhibit B-9
Baseline equivalence of fall teacher survey items

	Program	Control	*p*-Value
How often students write multiple related paragraphs of less than 2 pages	40%	34%	.44
	-0.41	-0.65	
	(0.19)	(0.22)	
	n =130	*n* =142	
Minutes students spend writing per week	115.44	109.33	.64
	(10.90)	(8.60)	
	n =128	*n* =139	
How often students write over a shorter time frame	67%	62%	.41
	0.69	0.47	
	(0.20)	(0.23)	
	n =131	*n* =144	

Note: Standard errors are in parentheses.
Source: Fall SEED teacher survey.

Descriptive Measures

This section presents additional detail for survey items where unadjusted survey data were described in the text. These data do not correspond to specific exhibits in the report. The data below is from spring 2013. Exhibit B-10 and B-11 correspond to descriptive data found on page 55.

Exhibit B-10
Teachers' reports of their understanding of the CCSS-ELA in their grade level

		(1) Strongly Disagree	(2) Disagree	(3) Neither Agree nor Disagree	(4) Agree	(5) Strongly Agree	*n*
I have a strong understanding of the CCSS-ELA in my grade level.	Program	1%	13%	33%	48%	5%	143
	Control	10%	24%	35%	27%	4%	165

Source: SEED teacher surveys.

Exhibit B-11
Teachers' reported belief that the CCSS-ELA require them to change how they teach writing

		(1) Strongly Disagree	(2) Disagree	(3) Neither Agree nor Disagree	(4) Agree	(5) Strongly Agree	*n*
The CCSS-ELA require me to change how I teach writing.	Program	1%	9%	40%	44%	5%	142
	Control	4%	12%	35%	41%	9%	164

Source: SEED teacher surveys.

Exhibit B-12 corresponds to descriptive data found on page 56.

Exhibit B-12
Teachers' reports of their effectiveness at teaching opinion and argumentative writing

		(1) Strongly Disagree	(2) Disagree	(3) Neither Agree nor Disagree	(4) Agree	(5) Strongly Agree	*n*
I am effective at teaching opinion and argumentative writing.	Program	1%	4%	22%	57%	16%	144
	Control	4%	10%	40%	42%	4%	161

Source: SEED teacher surveys.

Estimating Impacts

This section presents the results of the full, covariate-adjusted models for teacher outcome analyses in Chapter 4. The detailed models for the analyses are discussed in Appendix A. For each teacher outcome we list each predictor included in the model, estimated coefficient, and standard error for the estimated coefficient.

Exhibits B-13 to B-15 present data on teachers' self-confidence about their knowledge and skills related to the CCSS-ELA. They correspond to Exhibit 4-1.

Exhibit B-13
Teachers' reported self-confidence in their preparation to teach the new CCSS-ELA (303 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.62 **	0.14
Baseline score	0.20 **	0.06
Imputation flag for baseline score	0.36	0.21
School average for baseline score	0.28	0.18
Intercept	0.97	0.61
Random Effects	**Variance Component**	
School mean	0.09	
Teacher effect	0.68	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-14
Teachers' reported strength of understanding of the CCSS-ELA in their grade level (308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.38 **	0.13
Baseline score	0.29 **	0.05
Imputation flag for baseline score	0.61 **	0.20
School average for baseline score	0.53 **	0.18
Intercept	0.06	0.59
Random Effects	**Variance Component**	
School mean	0.06	
Teacher effect	0.66	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-15
Teachers' reported belief that the CCSS-ELA require them to change how they teach writing (297 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	-0.05	0.13
Baseline score	0.24 **	0.07
Imputation flag for baseline score	0.60 *	0.25
School average for baseline score	0.25	0.23
Intercept	1.30	0.73
Random Effects	**Variance Component**	
School mean	0.07	
Teacher effect	0.64	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibits B-16 and B-17 present data on teachers' reports of self-efficacy for writing instruction and their attitude toward writing and teaching writing. They correspond to Exhibit 4-2.

Exhibit B-16
Teachers' reports of the degree they believe in their own effectiveness at teaching writing (307 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.44 **	0.10
Baseline score	0.47 **	0.06
Imputation flag for baseline score	1.60 **	0.21
School average for baseline score	0.15	0.16
Intercept	1.11	0.59
Random Effects	**Variance Component**	
School mean	0.06	
Teacher effect	0.28	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

This measure is a scale averaged from the following items: I am effective at teaching writing, I am effective at teaching opinion and argumentative writing, I am effective at integrating writing into my content area of instruction, and I am effective at structuring classroom time to allow for students' planning, drafting, and revising of their writing.

Source: SEED teacher surveys.

Exhibit B-17
Teachers' reports on their attitude toward writing and teaching writing (306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.11	0.09
Baseline score	0.76 **	0.06
Imputation flag for baseline score	2.76 **	0.23
School average for baseline score	0.22	0.16
Intercept	-0.17	0.65
Random Effects	**Variance Component**	
School mean	0.03	
Teacher effect	0.38	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

This measure is a scale averaged from the following items: I like to write, I like planning, drafting, and revising my own written work, I like to teach creative writing, and I like to teach information or non-fiction writing.

Source: SEED teacher surveys.

Exhibits B-18 and B-19 present data on teachers' reports of the minutes students spent writing and time teachers spent teaching writing per week. They correspond to Exhibit 4-3.

Exhibit B-18
Teachers' reports on minutes students spent on writing per week (307 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	21.68 *	9.93
Baseline score	0.18 **	0.05
Imputation flag for baseline score	16.76	11.20
School average for baseline score	0.21	0.15
Intercept	75.95 *	32.20
Random Effects	**Variance Component**	
School mean	223.35	
Teacher effect	5365.51	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

Source: SEED teacher surveys.

Exhibit B-19
Teachers' reports on minutes spent teaching writing per week (305 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.74	7.32
Baseline score	0.17 **	0.04
Imputation flag for baseline score	0.48	7.67
School average for baseline score	0.41 **	0.13
Intercept	49.19 *	19.10
Random Effects	**Variance Component**	
School mean	148.81	
Teacher effect	2499.32	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibits B-20 to B-23 present data on teachers' reports on the time frame and length of students' writing. They correspond to Exhibit 4-4.

Exhibit B-20
Teachers' reports on how frequently students write over a shorter time frame (i.e., a single sitting or a day or two) (321 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.25	0.19
Baseline score	0.29 **	0.06
Imputation flag for baseline score	1.28 **	0.35
School average for baseline score	0.34	0.19
Intercept	1.26	1.08
Random Effects	**Variance Component**	
School mean	0.09	
Teacher effect	1.91	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-21
Teachers' reports on how frequently students write over an extended time frame (i.e., over a week or more, to allow for research, reflection, and revision) (321 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.10	0.20
Baseline score	0.33 **	0.06
Imputation flag for baseline score	1.18 **	0.25
School average for baseline score	0.19	0.19
Intercept	1.08	0.79
Random Effects	**Variance Component**	
School mean	0.18	
Teacher effect	1.56	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-22
Teachers' reports on how frequently students write multiple related paragraphs of less than 2 pages (312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.21	0.18
Baseline score	0.46 **	0.06
Imputation flag for baseline score	2.17 **	0.31
School average for baseline score	0.03	0.15
Intercept	2.02 *	0.81
Random Effects	**Variance Component**	
School mean	0.08	
Teacher effect	1.72	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-23
Teachers' reports on how frequently students write multiple related paragraphs of 2 or more pages (309 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.23	0.22
Baseline score	0.29 **	0.07
Imputation flag for baseline score	0.75 **	0.26
School average for baseline score	0.35	0.19
Intercept	1.23	0.74
Random Effects	**Variance Component**	
School mean	0.21	
Teacher effect	1.77	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-24 presents data on teachers' reports of frequency of asking students to write opinion/ argument or persuasive text. It corresponds to Exhibit 4-5.

Exhibit B-24
Teachers' reports on the frequency of asking students to write opinion/ argument or persuasive text (316 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.89 **	0.20
Baseline score	0.26 **	0.07
Imputation flag for baseline score	1.02 **	0.28
School average for baseline score	-0.15	0.21
Intercept	2.83 **	0.78
Random Effects	**Variance Component**	
School mean	0.13	
Teacher effect	1.90	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-25 presents data on teachers' reports on the frequency of teaching aspects of effective argument writing. It corresponds to Exhibit 4-6.

Exhibit B-25
Teachers' reports on the frequency of teaching aspects of effective argument writing (309 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.90 **	0.17
Baseline score	0.47 **	0.06
Imputation flag for baseline score	1.75 **	0.24
School average for baseline score	-0.22	0.18
Intercept	2.06 **	0.68
Random Effects	**Variance Component**	
School mean	0.10	
Teacher effect	1.35	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

This measure is a scale averaged from the following items: Teach students organizational strategies for expressing an opinion or making a claim in writing, Teach students about words and phrases specific to expressing an opinion in writing (e.g., certain uses of "because," "for instance," or "specifically"), Teach students how to convey a clear and consistent point of view on a topic, Provide opportunities for students to practice expressing an opinion or claim through speaking (e.g., oral presentation), Use models (e.g., mentor texts) to teach students how to express a written opinion or make an argument, and Teach students how to support their opinions with reasons and evidence.

Source: SEED teacher surveys.

Exhibit B-26 presents data on teachers' reports on the frequency of teaching students craft elements. It corresponds to Exhibit 4-7.

Exhibit B-26
Teachers' reports on the frequency of teaching students craft elements (314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.72 **	0.15
Baseline score	0.54 **	0.06
Imputation flag for baseline score	2.18 **	0.27
School average for baseline score	-0.00	0.15
Intercept	1.09	0.65
Random Effects	**Variance Component**	
School mean	0.05	
Teacher effect	1.21	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

This measure is a scale averaged from the following items: Choosing words effectively, Writing more complex sentences, Teach students organizational strategies for expressing an opinion or making a claim in writing, Teach students about words and phrases specific to expressing an opinion in writing, and Teach students how to convey a clear and consistent point of view on a topic.

Source: SEED teacher surveys.

Exhibits B-27 to B-30 present data on teachers' reports on the frequency with which students engaged in various writing processes. They correspond to Exhibit 4-8.

Exhibit B-27
Teachers' reports on the frequency students engaged in composing text (315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.48 *	0.19
Baseline score	0.40 **	0.06
Imputation flag for baseline score	1.99 **	0.33
School average for baseline score	0.08	0.16
Intercept	1.74	0.94
Random Effects	**Variance Component**	
School mean	0.13	
Teacher effect	1.54	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

Source: SEED teacher surveys.

Exhibit B-28
Teachers' reports on the frequency students engaged in editing text (focused on grammar, usage, punctuation, spelling) (316 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.27	0.17
Baseline score	0.43 **	0.07
Imputation flag for baseline score	2.08 **	0.37
School average for baseline score	0.23	0.12
Intercept	0.72	0.75
Random Effects	**Variance Component**	
School mean	0.04	
Teacher effect	1.89	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-29
Teachers' reports on the frequency students engaged in brainstorming or organizing ideas for writing text (315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.43 *	0.19
Baseline score	0.33 **	0.06
Imputation flag for baseline score	1.60 **	0.32
School average for baseline score	0.01	0.15
Intercept	2.05 *	0.91
Random Effects	**Variance Component**	
School mean	0.16	
Teacher effect	1.53	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibit B-30
Teachers' reports on the frequency students engaged in revising text (focused on meaning, ideas, and organization) (311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.25	0.16
Baseline score	0.54 **	0.07
Imputation flag for baseline score	2.30 **	0.33
School average for baseline score	0.23	0.13
Intercept	0.38	0.72
Random Effects	**Variance Component**	
School mean	0.03	
Teacher effect	1.61	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

Source: SEED teacher surveys.

Exhibit B-31 presents data on teachers' reports on the frequency with which they engaged students in feedback activities. It corresponds to Exhibit 4-9.

Exhibit B-31
Teachers' reports on the frequency with which they engaged students in feedback activities (316 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.38 *	0.15
Baseline score	0.48 **	0.06
Imputation flag for baseline score	1.82 **	0.28
School average for baseline score	0.27	0.14
Intercept	0.10	0.71
Random Effects	**Variance Component**	
School mean	0.07	
Teacher effect	1.22	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

This measure is a scale averaged from the following items: Meeting individually with the teacher to get oral feedback or discuss how to improve his or her writing, Reviewing written feedback on their own writing given by the teacher, and Receiving feedback from peers on their writing.

Source: SEED teacher surveys.

Exhibit B-32 presents data on teachers' reports on the frequency with which they asked students to write to monitor learning. It corresponds to Exhibit 4-10.

Exhibit B-32
Teachers' reports of the frequency with which they asked students to write to monitor learning (313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.55 *	0.25
Baseline score	0.34 **	0.06
Imputation flag for baseline score	1.77 **	0.33
School average for baseline score	0.30	0.20
Intercept	0.46	1.10
Random Effects	**Variance Component**	
School mean	0.20	
Teacher effect	2.85	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

Source: SEED teacher surveys.

Exhibits B-33 and B-34 present data on teachers' reports on the frequency with which they asked students to write as part of larger learning activities. They correspond to Exhibit 4-11.

Exhibit B-33
Teachers' reports of the frequency with which they expected students to read or learn about the topic before starting to write (310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.37 **	0.12
Baseline score	0.32 **	0.06
Imputation flag for baseline score	0.94 **	0.23
School average for baseline score	-0.13	0.16
Intercept	1.97 **	0.52
Random Effects	**Variance Component**	
School mean	0.00	
Teacher effect	0.98	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

Source: SEED teacher surveys.

Exhibit B-34
Teachers' reports of the frequency with which they engaged students in inquiry/ research activities in which they gather, organize, and analyze information or data as part of the assignment (309 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.43 **	0.15
Baseline score	0.34 **	0.06
Imputation flag for baseline score	0.86 **	0.21
School average for baseline score	0.11	0.21
Intercept	1.41 *	0.60
Random Effects	**Variance Component**	
School mean	0.05	
Teacher effect	0.91	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Exhibits B-35 and B-36 presents data on teachers' reports on frequency with which teachers reported giving students a choice of writing topic or sharing writing with external audiences. They correspond to Exhibit 4-12.

Exhibit B-35
Frequency with which teachers reported allowing students to choose their own writing topic (309 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.20	0.12
Baseline score	0.26 **	0.07
Imputation flag for baseline score	0.82 **	0.23
School average for baseline score	0.03	0.18
Intercept	1.94 **	0.58
Random Effects	**Variance Component**	
School mean	0.04	
Teacher effect	0.72	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*

Source: SEED teacher surveys.

Exhibit B-36
Frequency with which teachers reported asking students to share final writing pieces with audiences outside the classroom (315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.09	0.10
Baseline score	0.28 **	0.07
Imputation flag for baseline score	0.71 **	0.17
School average for baseline score	0.35	0.22
Intercept	0.60	0.51
Random Effects	**Variance Component**	
School mean	0.01	
Teacher effect	0.59	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED teacher surveys.

Reliability of Scales

For each constructed scale from the teacher survey, Exhibit B-37 below list the content of items that make up the scale and report the Cronbach's alpha (α) to indicate the internal reliability of the scale.

Exhibit B-37

Teacher survey scales

Factors	Survey Items	Reliability (α)
Degree of teachers' belief in their own effectiveness at teaching writing	To what extent do you disagree or agree with each of the following statements: I am effective at teaching writing. I am effective at teaching opinion and argumentative writing. I am effective at integrating writing into my content area of instruction. I am effective at structuring classroom time to allow for students' planning, drafting, and revising of their writing.	.82
Positive attitude towards writing and teaching writing	To what extent do you disagree or agree with each of the following statements: I like to write. I like planning, drafting, and revising my own written work. I like to teach creative writing. I like to teach information or non-fiction writing.	.79

Exhibit B-37
Teacher survey scales (continued)

Factors	Survey Items	Reliability (α)
Devoting class time to goals related to opinion/ argumentative writing	How often do you devote class time to each of the following goals for teaching opinion/argumentative writing (i.e., how often do you provide instruction or time for students to write where the following are an explicit focus for the class time)? Teach students organizational strategies for expressing an opinion or making a claim in writing Teach students about words and phrases specific to expressing an opinion in writing (e.g., certain uses of “because,” “for instance,” or “specifically”) Teach students how to convey a clear and consistent point of view on a topic Provide opportunities for students to practice expressing an opinion or claim through speaking (e.g., oral presentation) Use models (e.g., mentor texts) to teach students how to express a written opinion or make an argument Teach students how to support their opinions with reasons and evidence	.95

Exhibit B-37
Teacher survey scales (continued)

Factors	Survey Items	Reliability (α)
Teaching of craft	How often do you devote class time to each of the following goals (i.e., how often do you provide instruction or time for students to write where the following are an explicit focus for the class time)? Choosing words effectively Writing more complex sentences Teach students organizational strategies for expressing an opinion or making a claim in writing Teach students about words and phrases specific to expressing an opinion in writing Teach students how to convey a clear and consistent point of view on a topic	.90
Engage students in feedback activities	How often do students in your class engage in the following writing-related activities? Meeting individually with the teacher to get oral feedback or discuss how to improve his or her writing Reviewing written feedback on their own writing given by the teacher Receiving feedback from peers on their writing.	.89

Intraclass Correlation Coefficient (ICC)

The ICC data presented below supports the assertion in chapter four that more variation in teacher practice was higher within schools than between schools. For fall to spring gain in each teacher practice item, Exhibit B-38 presents the average gain, within- and between-school variances, and ICC (calculated as between-school variance divided by the sum of within- and between-school variances). The ICC parses out the proportion of variance that is attributable to variation among groups as opposed to the variation of individuals within groups.

Exhibit B-38

Intraclass correlation coefficients (326 teachers in 42 schools)

Teacher Practice Items	Program				Control			
	Average Gain	Between-School Variance	Within-School Variance	ICC	Average Gain	Between-School Variance	Within-School Variance	ICC
How often students write 1-2 sentences	-0.05	0.00	2.21	0.00	0.13	0.00	1.17	0.00
How often students write 1 paragraph	-0.04	0.00	1.53	0.00	0.03	0.12	1.40	0.08
How often students write multiple related paragraphs of less than 2 pages	0.06	0.11	1.98	0.05	0.02	0.00	2.17	0.00
How often students write multiple related paragraphs of 2 or more pages	-0.05	0.00	3.12	0.00	0.03	0.02	2.11	0.01
Minutes students spend writing per week	4.80	0.00	17643.03	0.00	-4.34	317.99	5760.43	0.05
Minutes teacher spends teaching writing per week	-12.09	0.00	9566.14	0.00	-3.84	152.26	4237.85	0.03
How often students write over an extended time frame	-0.01	0.13	2.41	0.05	0.03	0.16	2.35	0.06
How often students write over a over a shorter time frame	0.30	0.05	2.84	0.02	0.07	0.00	3.21	0.00
How often students write to monitor or keep track of learning	0.71	0.00	4.03	0.00	0.14	0.11	4.89	0.02
How often students write to reflect on an experience or topic	0.01	0.48	3.49	0.12	0.03	0.28	2.65	0.09
How often students write to express themselves creatively	0.53	0.18	1.76	0.09	-0.10	0.05	2.69	0.02

Exhibit B-38

Intraclass correlation coefficients (326 teachers in 42 schools) (continued)

Teacher Practice Items	Program				Control			
	Average Gain	Between-School Variance	Within-School Variance	ICC	Average Gain	Between-School Variance	Within-School Variance	ICC
How often students write to recount a story or event through narrative	0.25	0.68	1.74	0.28	0.00	0.00	2.68	0.00
How often students write to summarize a text	0.33	0.03	2.14	0.01	0.05	0.00	2.23	0.00
How often students write to describe a thing, place, process, or procedure	0.43	0.12	2.62	0.05	-0.12	0.00	2.63	0.00
How often students write to express an opinion, make a claim, or persuade others	1.29	0.60	2.47	0.20	0.19	0.00	2.82	0.00
How often students write to gain practice with writing mechanics within their own writing	0.39	0.44	3.42	0.11	-0.20	0.00	3.50	0.00
How often students write to gain practice with forms of writing encountered on standardized tests	0.41	0.08	3.62	0.02	-0.20	0.09	2.47	0.03
How often students write to compare and contrast different people, things, events, or ideas	0.12	0.06	1.80	0.03	0.18	0.00	2.65	0.00
How often students write to help learn content in subjects like science, social studies, and math	0.65	0.00	2.58	0.00	0.11	0.16	2.42	0.06
How often students brainstorm	0.25	0.05	1.92	0.03	-0.30	0.37	2.31	0.14
How often students compose text	0.34	0.14	2.17	0.06	-0.26	0.19	1.83	0.09
How often students edit text	0.07	0.07	2.25	0.03	-0.22	0.25	2.20	0.10

Exhibit B-38

Intraclass correlation coefficients (326 teachers in 42 schools) (continued)

Teacher Practice Items	Program				Control			
	Average Gain	Between-School Variance	Within-School Variance	ICC	Average Gain	Between-School Variance	Within-School Variance	ICC
How often students revise text	0.36	0.01	1.71	0.00	-0.10	0.14	1.76	0.07
How often students meet individually with teacher to improve writing	0.23	0.17	1.64	0.10	-0.15	0.15	1.86	0.07
How often students review written feedback on their writing from their teacher	0.22	0.23	2.08	0.10	0.01	0.03	2.26	0.01
How often students reflect on or assess their writing	0.48	0.00	2.36	0.00	-0.01	0.28	2.25	0.11
How often students receive feedback from peers on their writing	0.32	0.00	2.07	0.00	-0.11	0.08	1.73	0.05
How often students analyze what makes particular texts good or poor models of writing	0.44	0.16	2.47	0.06	-0.03	0.00	2.44	0.00
How often students share their final writing pieces with teacher	0.17	0.00	1.31	0.00	0.11	0.00	1.49	0.00
How often students share their final writing pieces with their classmates	0.21	0.04	0.91	0.05	-0.04	0.00	1.16	0.00
How often students share their final writing pieces with audiences outside the classroom	0.16	0.02	0.63	0.03	0.05	0.00	0.86	0.00
How often teacher reads her own writing to students	0.30	0.09	2.71	0.03	-0.12	0.00	2.03	0.00
How often teacher writes when students write	0.79	0.00	3.84	0.00	-0.02	0.00	2.98	0.00
How often teacher devotes class time to planning a writing task	0.29	0.22	2.67	0.08	-0.07	0.27	2.04	0.12

Exhibit B-38

Intraclass correlation coefficients (326 teachers in 42 schools) (continued)

Teacher Practice Items	Program				Control			
	Average Gain	Between-School Variance	Within-School Variance	ICC	Average Gain	Between-School Variance	Within-School Variance	ICC
How often teacher devotes class time to revising or editing their writing	0.23	0.28	2.11	0.12	-0.13	0.24	2.15	0.10
How often teacher devotes class time to students summarizing in writing what they have read	0.21	0.25	1.88	0.12	-0.10	0.13	2.92	0.04
How often teacher devotes class time to writing more complex sentences	0.50	0.04	2.42	0.02	-0.24	0.00	2.81	0.00
How often teacher devotes class time to choosing words effectively	0.38	0.23	2.43	0.09	-0.21	0.01	2.51	0.00
How often teacher establishes goals for what students are to include in their writing	0.48	0.15	1.15	0.12	-0.04	0.00	1.79	0.00
How often teacher allows students to choose their own writing topic	0.07	0.22	0.96	0.19	-0.12	0.00	1.30	0.00
How often teacher expects students to read or learn about the topic before starting to write	0.56	0.14	1.61	0.08	0.03	0.00	1.57	0.00
How often teacher expects students to use strategies for prewriting or planning a writing task	0.27	0.40	1.27	0.24	-0.07	0.11	1.32	0.08
How often teacher teaches students about word choice specific to the assignment	0.61	0.04	1.37	0.03	0.11	0.00	1.67	0.00

Exhibit B-38

Intraclass correlation coefficients (326 teachers in 42 schools) (continued)

Teacher Practice Items	Program				Control			
	Average Gain	Between-School Variance	Within-School Variance	ICC	Average Gain	Between-School Variance	Within-School Variance	ICC
How often teacher engages students in inquiry/research activities in which they gathered, organized, and analyzed information or data as part of the assignment	0.69	0.08	1.31	0.06	0.15	0.00	1.33	0.00
How often teacher incorporates time for students to revise or edit their writing	0.31	0.00	1.15	0.00	-0.03	0.00	1.19	0.00
How often teacher expects students to work with classmates to plan, draft, revise, or edit their writing	0.34	0.00	1.36	0.00	-0.08	0.00	1.70	0.00
How often teacher connects to the content that students were learning in science, social studies, or math	0.54	0.00	1.26	0.00	0.00	0.00	1.17	0.00
How often teacher expects students to complete the writing assignment using word processing	0.29	0.00	1.18	0.00	0.07	0.09	1.61	0.05
How often teacher expects students to use technology to collaborate and/or share their writing with others	0.18	0.00	1.00	0.00	-0.10	0.09	1.64	0.05
How often teacher uses a process approach to writing instruction in the classroom	0.56	0.13	1.68	0.07	0.03	0.00	2.09	0.00
How often teacher devotes class time to teach students organizational strategies for expressing an opinion or making a claim in writing	1.38	0.36	2.56	0.12	0.06	0.21	2.24	0.09

Exhibit B-38
Intraclass correlation coefficients (326 teachers in 42 schools) (continued)

Teacher Practice Items	Program				Control			
	Average Gain	Between-School Variance	Within-School Variance	ICC	Average Gain	Between-School Variance	Within-School Variance	ICC
How often teacher devotes class time to teach students about words and phrases specific to expressing an opinion in writing	1.00	0.31	2.33	0.12	0.22	0.12	2.42	0.05
How often teacher devotes class time to teach students how to convey a clear and consistent point of view on a topic	1.13	0.32	3.03	0.10	-0.06	0.16	2.34	0.07
How often teacher devotes class time to provide opportunities for students to practice expressing an opinion or claim through speaking	0.96	0.88	2.55	0.26	0.15	0.00	2.82	0.00
How often teacher devotes class time to using models to teach students how to express a written opinion or make an argument	1.13	0.67	2.54	0.21	0.03	0.02	2.50	0.01
How often teacher devotes class time to teach students how to support their opinions with reasons and evidence	1.19	1.01	2.24	0.31	0.11	0.18	2.42	0.07
Average				0.07				0.03

Source: SEED teacher surveys.

Chapter 5 - Student Outcomes

The data presented in this section provide further documentation for the prompt data in the student outcomes chapter. Additional detail on the baseline and spring measures, student impact tables and correlational analysis is presented below.

Baseline and Spring Measures

This section presents equivalence testing between students in program and comparison schools estimated from a two-level hierarchical model for baseline and spring 2013. Each table in this section presents the average rating on each student prompt score and the standard error of the score estimated from the hierarchical model, the number of respondents included in the analysis, as well as the p values corresponding to tests of the significance of the difference between students in program and control schools. Because only intact pairs of student prompts were scored, the number of students at baseline and spring are the same.

Exhibit B-39 presents the baseline average, holistic, and analytic student prompt scores.

Exhibit B-39

Fall student writing prompt descriptives (3,835 writing samples in 42 schools)

	Program	Control
Average score	2.60	2.60
	(0.05)	(0.05)
	n =1755	*n* =2080
Holistic	2.64	2.64
	(0.05)	(0.06)
	n =1755	*n* =2080
Content	2.68	2.66
	(0.05)	(0.06)
	n =1755	*n* =2080
Structure	2.48	2.47
	(0.05)	(0.05)
	n =1755	*n* =2080
Stance	2.75	2.75
	(0.05)	(0.05)
	n =1755	*n* =2080
Sentence Fluency	2.58	2.59
	(0.05)	(0.05)
	n =1755	*n* =2080
Diction	2.64	2.64
	(0.05)	(0.05)
	n =1755	*n* =2080
Conventions	2.46	2.49
	(0.05)	(0.05)
	n =1755	*n* =2080

Note: Standard errors are in parentheses.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-40 presents spring 2013 average, holistic, and analytic student prompt scores.

Exhibit B-40
Spring student writing prompt descriptives (3,835 writing samples in 42 schools)

	Program	Control
Average score	3.16 (0.06) *n* =1755	3.15 (0.06) *n* =2080
Holistic	3.22 (0.06) *n* =1755	3.21 (0.06) *n* =2080
Content	3.24 (0.06) *n* =1755	3.23 (0.07) *n* =2080
Structure	3.05 (0.06) *n* =1755	3.02 (0.06) *n* =2080
Stance	3.33 (0.05) *n* =1755	3.28 (0.06) *n* =2080
Sentence Fluency	3.16 (0.06) *n* =1755	3.15 (0.06) *n* =2080
Diction	3.18 (0.06) *n* =1755	3.15 (0.06) *n* =2080
Conventions	3.02 (0.06) *n* =1755	3.07 (0.06) *n* =2080

Note: Standard errors are in parentheses.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Estimating Impacts

Exhibits B-41 to B-48 present the results of the full, covariate-adjusted models for student outcome analyses in Chapter 4. The detailed models for the analyses are discussed in Appendix A. For each student outcome we list each predictor included in the model, estimated coefficient, and standard error for the estimated coefficient.

Exhibit B-41
HLM model for writing prompts average score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.00	0.05
Baseline average score	0.56 **	0.02
Grade 4	0.22 **	0.04
Grade 5	0.19 **	0.04
Intercept	0.00	0.06
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.11	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-42
HLM model for writing prompts holistic score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.00	0.05
Baseline holistic score	0.49 **	0.02
Grade 4	0.24 **	0.04
Grade 5	0.17 **	0.04
Intercept	-0.01	0.07
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.11	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-43
HLM model for writing prompts content score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	-0.01	0.05
Baseline content score	0.46 **	0.02
Grade 4	0.29 **	0.04
Grade 5	0.20 **	0.04
Intercept	-0.02	0.08
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.13	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-44
HLM model for writing prompts structure score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.01	0.05
Baseline structure score	0.46 **	0.02
Grade 4	0.23 **	0.04
Grade 5	0.25 **	0.04
Intercept	0.01	0.07
Random Effects	**Variance Component**	
Student effect	1.05	
School mean	0.12	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-45
HLM model for writing prompts stance score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.04	0.05
Baseline stance score	0.44 **	0.02
Grade 4	0.27 **	0.04
Grade 5	0.28 **	0.04
Intercept	-0.03	0.06
Random Effects	**Variance Component**	
Student effect	1.10	
School mean	0.09	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-46
HLM model for writing prompts sentence fluency score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.00	0.04
Baseline sentence fluency score	0.50 **	0.02
Grade 4	0.25 **	0.04
Grade 5	0.21 **	0.04
Intercept	0.02	0.06
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.09	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-47
HLM model for writing prompts diction score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	0.02	0.04
Baseline diction score	0.49 **	0.02
Grade 4	0.23 **	0.04
Grade 5	0.20 **	0.04
Intercept	-0.03	0.06
Random Effects	**Variance Component**	
Student effect	0.96	
School mean	0.09	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Exhibit B-48
HLM model for writing prompts conventions score (3,835 writing samples in 42 schools)

Fixed Effects	Coefficient	*SE*
Program	-0.04	0.05
Baseline conventions score	0.56 **	0.02
Grade 4	0.28 **	0.04
Grade 5	0.21 **	0.04
Intercept	0.01	0.07
Random Effects	**Variance Component**	
Student effect	1.00	
School mean	0.10	

Note: Coefficients for site indicators are omitted from the table.
**p < 0.05, **p < 0.01*
Source: SEED student writing prompts.

Correlational analysis: Relating teacher practices to student outcomes

Exhibits B-49 to B-176 present the results of the full, covariate-adjusted models for correlational analyses in Chapter 5. The detailed models for the analyses are discussed in Appendix A. For each student outcome and teacher practice indicator from the spring survey, the tables list each predictor included in the model, estimated coefficient, and standard error for the estimated coefficient.

Exhibit B-49
HLM model results relating craft of writing scale with average score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.02	0.02
Baseline average score	0.55**	0.02
Grade 4	0.22**	0.06
Grade 5	0.17**	0.06
Intercept	-0.19*	0.08
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-50
HLM model results relating how often teachers asked students to brainstorm with average score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.00	0.02
Baseline average score	0.55**	0.02
Grade 4	0.22**	0.06
Grade 5	0.18**	0.06
Intercept	-0.14	0.09
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-51
HLM model results relating how often teachers asked students to compose text with average score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.02	0.02
Baseline average score	0.55**	0.02
Grade 4	0.22**	0.06
Grade 5	0.18**	0.06
Intercept	-0.23*	0.09
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-52
HLM model results relating how often teachers asked students to edit text with average score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.03	0.02
Baseline average score	0.55**	0.02
Grade 4	0.21**	0.05
Grade 5	0.18**	0.06
Intercept	-0.26**	0.09
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-53
HLM model results relating how often teachers asked students to revise text with average score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.03	0.02
Baseline average score	0.55**	0.02
Grade 4	0.22**	0.06
Grade 5	0.18**	0.06
Intercept	-0.24**	0.08
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-54
HLM model results relating feedback scale with average score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.02	0.02
Baseline average score	0.55**	0.02
Grade 4	0.22**	0.06
Grade 5	0.18**	0.06
Intercept	-0.20*	0.08
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-55
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with average score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.02	0.02
Baseline average score	0.55**	0.02
Grade 4	0.22**	0.06
Grade 5	0.18**	0.06
Intercept	-0.19**	0.07
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-56
HLM model results relating minutes students spent writing per week with average score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.04*	0.02
Baseline average score	0.56**	0.02
Grade 4	0.22**	0.06
Grade 5	0.18**	0.06
Intercept	-0.20**	0.06
Random Effects	**Variance Component**	
Student effect	0.89	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-57
HLM model results relating minutes teachers spent teaching writing per week with average score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.02	0.03
Baseline average score	0.56**	0.02
Grade 4	0.22**	0.06
Grade 5	0.16**	0.06
Intercept	-0.14*	0.06
Random Effects	**Variance Component**	
Student effect	0.89	
School mean	0.17	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-58
HLM model results relating how often teachers asked students to write over an extended time frame with average score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.03	0.02
Baseline average score	0.55**	0.02
Grade 4	0.21**	0.05
Grade 5	0.18**	0.06
Intercept	-0.21**	0.07
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-59
HLM model results relating how often teachers asked students to write over a shorter time frame with average score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.03	0.02
Baseline average score	0.55**	0.02
Grade 4	0.21**	0.05
Grade 5	0.18**	0.06
Intercept	-0.28**	0.09
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-60
HLM model results relating how often teachers asked students to write 1 or 2 sentences with average score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	0.00	0.02
Baseline average score	0.56**	0.02
Grade 4	0.22**	0.06
Grade 5	0.17**	0.06
Intercept	-0.11	0.14
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-61
HLM model results relating how often teachers asked students to write 1 paragraph with average score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.03	0.02
Baseline average score	0.56**	0.02
Grade 4	0.22**	0.06
Grade 5	0.17**	0.06
Intercept	-0.29*	0.12
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-62
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with average score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03*	0.02
Baseline average score	0.55**	0.02
Grade 4	0.20**	0.06
Grade 5	0.15*	0.06
Intercept	-0.24**	0.08
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-63
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with average score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.02	0.02
Baseline average score	0.56**	0.02
Grade 4	0.22**	0.06
Grade 5	0.17**	0.06
Intercept	-0.17**	0.06
Random Effects	**Variance Component**	
Student effect	0.90	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-64
HLM model results relating teaching argument scale with average score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.02	0.02
Baseline average score	0.56**	0.02
Grade 4	0.21**	0.06
Grade 5	0.16**	0.06
Intercept	-0.17*	0.08
Random Effects	**Variance Component**	
Student effect	0.89	
School mean	0.17	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-65
HLM model results relating craft of writing scale with holistic score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.02	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.16**	0.06
Intercept	-0.19*	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-66
HLM model results relating how often teachers asked students to brainstorm with holistic score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.01	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.16**	0.06
Intercept	-0.15	0.10
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-67
HLM model results relating how often teachers asked students to compose text with holistic score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.02	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.16**	0.06
Intercept	-0.24*	0.10
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-68
HLM model results relating how often teachers asked students to edit text with holistic score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.03	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.17**	0.06
Intercept	-0.25**	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-69
HLM model results relating how often teachers asked students to revise text with holistic score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.03	0.02
Baseline holistic score	0.48**	0.02
Grade 4	0.25**	0.06
Grade 5	0.16**	0.06
Intercept	-0.24**	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-70
HLM model results relating feedback scale with holistic score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.02	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.17**	0.06
Intercept	-0.19*	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-71
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with holistic score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.01	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.16**	0.06
Intercept	-0.17*	0.08
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Exhibit B-72
HLM model results relating minutes students spent writing per week with holistic score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.05*	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.16**	0.06
Intercept	-0.21**	0.06
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-73
HLM model results relating minutes teachers spent teaching writing per week with holistic score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.01	0.03
Baseline holistic score	0.50**	0.02
Grade 4	0.25**	0.06
Grade 5	0.14*	0.06
Intercept	-0.14*	0.06
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-74
HLM model results relating how often teachers asked students to write over an extended time frame with holistic score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.03	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.16**	0.06
Intercept	-0.22**	0.07
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-75
HLM model results relating how often teachers asked students to write over a shorter time frame with holistic score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.03	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.16**	0.06
Intercept	-0.27**	0.10
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-76
HLM model results relating how often teachers asked students to write 1 or 2 sentences with holistic score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	-0.01	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.15*	0.06
Intercept	-0.08	0.15
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.15	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-77
HLM model results relating how often teachers asked students to write 1 paragraph with holistic score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.02	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.15*	0.06
Intercept	-0.27*	0.13
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-78
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with holistic score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.23**	0.06
Grade 5	0.12*	0.06
Intercept	-0.24**	0.08

Random Effects	Variance Component
Student effect	0.99
School mean	0.17
Teacher mean	0.28

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-79
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with holistic score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.02	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.15*	0.06
Intercept	-0.17**	0.07

Random Effects	Variance Component
Student effect	1.00
School mean	0.16
Teacher mean	0.28

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-80
HLM model results relating teaching argument scale with holistic score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.02	0.02
Baseline holistic score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.15*	0.06
Intercept	-0.17*	0.08
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.17	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-81
HLM model results relating craft of writing scale with content score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.01	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.17**	0.06
Intercept	-0.21*	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-82
HLM model results relating how often teachers asked students to brainstorm with content score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.00	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.17	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-83
HLM model results relating how often teachers asked students to compose text with content score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.02	0.02
Baseline content score	0.45**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.26*	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-84
HLM model results relating how often teachers asked students to edit text with content score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.03	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.28**	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-85
HLM model results relating how often teachers asked students to revise text with content score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.02	0.02
Baseline content score	0.45**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.26**	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-86
HLM model results relating feedback scale with content score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.01	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.20*	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-87
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with content score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.02	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.22**	0.08
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-88
HLM model results relating minutes students spent writing per week with content score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.04	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.18**	0.06
Intercept	-0.22**	0.07
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.30	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-89
HLM model results relating minutes teachers spent teaching writing per week with content score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.01	0.03
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.16*	0.06
Intercept	-0.16*	0.06
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-90

HLM model results relating how often teachers asked students to write over an extended time frame with content score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.04	0.02
Baseline content score	0.46**	0.02
Grade 4	0.28**	0.06
Grade 5	0.17**	0.06
Intercept	-0.26**	0.08
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-91

HLM model results relating how often teachers asked students to write over a shorter time frame with content score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.03	0.02
Baseline content score	0.46**	0.02
Grade 4	0.28**	0.06
Grade 5	0.17**	0.06
Intercept	-0.31**	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-92
HLM model results relating how often teachers asked students to write 1 or 2 sentences with content score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	-0.02	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.17**	0.06
Intercept	-0.06	0.16
Random Effects	**Variance Component**	
Student effect	1.03	
School mean	0.17	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-93
HLM model results relating how often teachers asked students to write 1 paragraph with content score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.02	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.16**	0.06
Intercept	-0.28*	0.13
Random Effects	**Variance Component**	
Student effect	1.03	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-94
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with content score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03	0.02
Baseline content score	0.46**	0.02
Grade 4	0.27**	0.06
Grade 5	0.15*	0.06
Intercept	-0.26**	0.08
Random Effects	**Variance Component**	
Student effect	1.03	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-95
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with content score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.02	0.02
Baseline content score	0.46**	0.02
Grade 4	0.29**	0.06
Grade 5	0.17**	0.06
Intercept	-0.20**	0.07
Random Effects	**Variance Component**	
Student effect	1.03	
School mean	0.18	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-96
HLM model results relating teaching argument scale with content score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.02	0.02
Baseline content score	0.46**	0.02
Grade 4	0.28**	0.06
Grade 5	0.17**	0.06
Intercept	-0.21*	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-97
HLM model results relating craft of writing scale with structure score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.23**	0.06
Grade 5	0.24**	0.06
Intercept	-0.27**	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-98
HLM model results relating how often teachers asked students to brainstorm with structure score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.02	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.24**	0.06
Grade 5	0.25**	0.06
Intercept	-0.22*	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-99
HLM model results relating how often teachers asked students to compose text with structure score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.24**	0.06
Grade 5	0.24**	0.06
Intercept	-0.27**	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-100
HLM model results relating how often teachers asked students to edit text with structure score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.23**	0.06
Grade 5	0.25**	0.06
Intercept	-0.29**	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-101
HLM model results relating how often teachers asked students to revise text with structure score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.04*	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.24**	0.06
Grade 5	0.24**	0.06
Intercept	-0.29**	0.09
Random Effects	**Variance Component**	
Student effect	1.01	
School mean	0.19	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-102
HLM model results relating feedback scale with structure score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.24**	0.06
Grade 5	0.25**	0.06
Intercept	-0.25**	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-103
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with structure score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.24**	0.06
Grade 5	0.25**	0.06
Intercept	-0.23**	0.08
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-104
HLM model results relating minutes students spent writing per week with structure score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.05*	0.02
Baseline structure score	0.46**	0.02
Grade 4	0.23**	0.06
Grade 5	0.23**	0.06
Intercept	-0.22**	0.07
Random Effects	**Variance Component**	
Student effect	1.01	
School mean	0.19	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-105
HLM model results relating minutes teachers spent teaching writing per week with structure score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.02	0.03
Baseline structure score	0.47**	0.02
Grade 4	0.23**	0.06
Grade 5	0.21**	0.06
Intercept	-0.15*	0.06
Random Effects	**Variance Component**	
Student effect	1.01	
School mean	0.20	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-106
HLM model results relating how often teachers asked students to write over an extended time frame with structure score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.22**	0.06
Grade 5	0.25**	0.06
Intercept	-0.23**	0.08
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-107
HLM model results relating how often teachers asked students to write over a shorter time frame with structure score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.04*	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.22**	0.06
Grade 5	0.25**	0.06
Intercept	-0.33**	0.10
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-108
HLM model results relating how often teachers asked students to write 1 or 2 sentences with structure score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	-0.01	0.02
Baseline structure score	0.46**	0.02
Grade 4	0.23**	0.06
Grade 5	0.24**	0.06
Intercept	-0.11	0.15
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-109
HLM model results relating how often teachers asked students to write 1 paragraph with structure score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.04	0.02
Baseline structure score	0.46**	0.02
Grade 4	0.23**	0.06
Grade 5	0.23**	0.06
Intercept	-0.34**	0.13
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.18	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-110
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with structure score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03	0.02
Baseline structure score	0.45**	0.02
Grade 4	0.21**	0.06
Grade 5	0.21**	0.06
Intercept	-0.26**	0.08
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-111
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with structure score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.02	0.02
Baseline structure score	0.46**	0.02
Grade 4	0.23**	0.06
Grade 5	0.24**	0.06
Intercept	-0.18**	0.07
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.19	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-112
HLM model results relating teaching argument scale with structure score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.03	0.02
Baseline structure score	0.46**	0.02
Grade 4	0.22**	0.06
Grade 5	0.23**	0.06
Intercept	-0.23**	0.09
Random Effects	**Variance Component**	
Student effect	1.02	
School mean	0.20	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-113
HLM model results relating craft of writing scale with stance score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.02	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.26**	0.06
Intercept	-0.27**	0.09
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-114
HLM model results relating how often teachers asked students to brainstorm with stance score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.02	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.28**	0.06
Intercept	-0.26*	0.10
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-115
HLM model results relating how often teachers asked students to compose text with stance score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.27**	0.06
Intercept	-0.31**	0.10
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-116
HLM model results relating how often teachers asked students to edit text with stance score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.28**	0.06
Intercept	-0.33**	0.10
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-117
HLM model results relating how often teachers asked students to revise text with stance score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.27**	0.06
Intercept	-0.31**	0.09
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.16	
Teacher mean	0.29	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-118
HLM model results relating feedback scale with stance score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.02	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.28**	0.06
Intercept	-0.27**	0.09
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-119
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with stance score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.02	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.27**	0.06
Intercept	-0.25**	0.08
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-120
HLM model results relating minutes students spent writing per week with stance score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.04*	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.30**	0.06
Grade 5	0.27**	0.06
Intercept	-0.27**	0.07
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-121
HLM model results relating minutes teachers spent teaching writing per week with stance score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.03	0.03
Baseline stance score	0.45**	0.02
Grade 4	0.30**	0.06
Grade 5	0.25**	0.06
Intercept	-0.21**	0.06
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.18	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-122
HLM model results relating how often teachers asked students to write over an extended time frame with stance score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.28**	0.06
Grade 5	0.27**	0.06
Intercept	-0.27**	0.08
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-123
HLM model results relating how often teachers asked students to write over a shorter time frame with stance score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.04*	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.28**	0.06
Grade 5	0.27**	0.06
Intercept	-0.37**	0.10
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-124
HLM model results relating how often teachers asked students to write 1 or 2 sentences with stance score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	0.00	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.26**	0.06
Intercept	-0.17	0.16
Random Effects	**Variance Component**	
Student effect	1.07	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-125
HLM model results relating how often teachers asked students to write 1 paragraph with stance score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.26**	0.06
Intercept	-0.35**	0.14
Random Effects	**Variance Component**	
Student effect	1.07	
School mean	0.17	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-126
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with stance score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.27**	0.06
Grade 5	0.24**	0.06
Intercept	-0.30**	0.08
Random Effects	**Variance Component**	
Student effect	1.07	
School mean	0.17	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-127
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with stance score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.02	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.29**	0.06
Grade 5	0.26**	0.06
Intercept	-0.23**	0.07
Random Effects	**Variance Component**	
Student effect	1.07	
School mean	0.18	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-128
HLM model results relating teaching argument scale with stance score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.03	0.02
Baseline stance score	0.44**	0.02
Grade 4	0.28**	0.06
Grade 5	0.26**	0.06
Intercept	-0.26**	0.09
Random Effects	**Variance Component**	
Student effect	1.06	
School mean	0.18	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-129
HLM model results relating craft of writing scale with sentence fluency score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.02	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.20**	0.06
Intercept	-0.20*	0.09
Random Effects	**Variance Component**	
Student effect	1.00	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-130

HLM model results relating how often teachers asked students to brainstorm with sentence fluency score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.00	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.21**	0.06
Intercept	-0.15	0.10
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-131

HLM model results relating how often teachers asked students to compose text with sentence fluency score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.02	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.21**	0.06
Intercept	-0.26**	0.10
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.15	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-132
HLM model results relating how often teachers asked students to edit text with sentence fluency score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.03*	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.21**	0.06
Intercept	-0.29**	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-133
HLM model results relating how often teachers asked students to revise text with sentence fluency score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.02	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.20**	0.06
Intercept	-0.24**	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.15	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-134
HLM model results relating feedback scale with sentence fluency score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.02	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.21**	0.06
Intercept	-0.22*	0.09
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-135
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with sentence fluency score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.02	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.25**	0.06
Grade 5	0.21**	0.06
Intercept	-0.21**	0.08
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-136
HLM model results relating minutes students spent writing per week with sentence fluency score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.05*	0.02
Baseline sentence fluency score	0.50**	0.02
Grade 4	0.26**	0.06
Grade 5	0.22**	0.06
Intercept	-0.24**	0.06
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.15	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-137
HLM model results relating minutes teachers spent teaching writing per week with sentence fluency score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.03	0.03
Baseline sentence fluency score	0.50**	0.02
Grade 4	0.26**	0.06
Grade 5	0.19**	0.06
Intercept	-0.17**	0.06
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.17	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-138

HLM model results relating how often teachers asked students to write over an extended time frame with sentence fluency score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.03	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.21**	0.06
Intercept	-0.23**	0.07
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-139

HLM model results relating how often teachers asked students to write over a shorter time frame with sentence fluency score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.03*	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.21**	0.06
Intercept	-0.31**	0.10
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Exhibit B-140
HLM model results relating how often teachers asked students to write 1 or 2 sentences with sentence fluency score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	0.01	0.02
Baseline sentence fluency score	0.50**	0.02
Grade 4	0.25**	0.06
Grade 5	0.20**	0.06
Intercept	-0.20	0.15
Random Effects	**Variance Component**	
Student effect	1.00	
School mean	0.15	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Exhibit B-141
HLM model results relating how often teachers asked students to write 1 paragraph with sentence fluency score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.03	0.02
Baseline sentence fluency score	0.50**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.33*	0.13
Random Effects	**Variance Component**	
Student effect	1.00	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-142
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with sentence fluency score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.05**	0.02
Baseline sentence fluency score	0.49**	0.02
Grade 4	0.23**	0.06
Grade 5	0.16**	0.06
Intercept	-0.31**	0.08
Random Effects	**Variance Component**	
Student effect	1.00	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-143
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with sentence fluency score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.03	0.02
Baseline sentence fluency score	0.50**	0.02
Grade 4	0.25**	0.06
Grade 5	0.19**	0.06
Intercept	-0.21**	0.06
Random Effects	**Variance Component**	
Student effect	1.00	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-144
HLM model results relating teaching argument scale with sentence fluency score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.02	0.02
Baseline sentence fluency score	0.50**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.18*	0.08
Random Effects	**Variance Component**	
Student effect	0.99	
School mean	0.17	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-145
HLM model results relating craft of writing scale with diction score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.01	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.16	0.08
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-146
HLM model results relating how often teachers asked students to brainstorm with diction score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.00	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.12	0.09
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-147
HLM model results relating how often teachers asked students to compose text with diction score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.02	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.22*	0.09
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-148
HLM model results relating how often teachers asked students to edit text with diction score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.02	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.23**	0.06
Grade 5	0.20**	0.06
Intercept	-0.23**	0.09
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-149
HLM model results relating how often teachers asked students to revise text with diction score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.03	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.25**	0.08
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-150
HLM model results relating feedback scale with diction score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.01	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.23**	0.06
Grade 5	0.20**	0.06
Intercept	-0.18*	0.08
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-151
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with diction score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.01	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.23**	0.06
Grade 5	0.20**	0.06
Intercept	-0.16*	0.07
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-152
HLM model results relating minutes students spent writing per week with diction score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.03	0.02
Baseline diction score	0.50**	0.02
Grade 4	0.24**	0.06
Grade 5	0.19**	0.06
Intercept	-0.18**	0.06
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.28	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-153
HLM model results relating minutes teachers spent teaching writing per week with diction score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.02	0.03
Baseline diction score	0.50**	0.02
Grade 4	0.24**	0.06
Grade 5	0.18**	0.06
Intercept	-0.15**	0.06
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-154
HLM model results relating how often teachers asked students to write over an extended time frame with diction score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.02	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.22**	0.06
Grade 5	0.19**	0.06
Intercept	-0.21**	0.07
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-155
HLM model results relating how often teachers asked students to write over a shorter time frame with diction score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.03	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.22**	0.06
Grade 5	0.19**	0.06
Intercept	-0.29**	0.09
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-156
HLM model results relating how often teachers asked students to write 1 or 2 sentences with diction score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	0.01	0.02
Baseline diction score	0.50**	0.02
Grade 4	0.24**	0.06
Grade 5	0.20**	0.06
Intercept	-0.19	0.14
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-157
HLM model results relating how often teachers asked students to write 1 paragraph with diction score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.03	0.02
Baseline diction score	0.50**	0.02
Grade 4	0.23**	0.06
Grade 5	0.18**	0.06
Intercept	-0.29*	0.12
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-158
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with diction score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03*	0.02
Baseline diction score	0.49**	0.02
Grade 4	0.22**	0.06
Grade 5	0.17**	0.06
Intercept	-0.25**	0.08
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.14	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-159
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with diction score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.01	0.02
Baseline diction score	0.50**	0.02
Grade 4	0.23**	0.06
Grade 5	0.19**	0.06
Intercept	-0.18**	0.06
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.15	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-160
HLM model results relating teaching argument scale with diction score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.00	0.02
Baseline diction score	0.50**	0.02
Grade 4	0.23**	0.06
Grade 5	0.18**	0.06
Intercept	-0.13	0.08
Random Effects	**Variance Component**	
Student effect	0.93	
School mean	0.16	
Teacher mean	0.27	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-161
HLM model results relating craft of writing scale with conventions score (3,016 writing samples from 313 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Craft of writing scale	0.03	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.27**	0.06
Grade 5	0.19**	0.06
Intercept	-0.25**	0.09
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-162
HLM model results relating how often teachers asked students to brainstorm with conventions score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students brainstorm	0.00	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.28**	0.06
Grade 5	0.20**	0.06
Intercept	-0.15	0.09
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-163
HLM model results relating how often teachers asked students to compose text with conventions score (3,027 writing samples from 314 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students compose text	0.03	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.28**	0.06
Grade 5	0.20**	0.06
Intercept	-0.27**	0.09
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-164
HLM model results relating how often teachers asked students to edit text with conventions score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students edit text	0.04*	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.27**	0.06
Grade 5	0.20**	0.06
Intercept	-0.32**	0.09
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.25	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-165
HLM model results relating how often teachers asked students to revise text with conventions score (2,988 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students revise text	0.03*	0.02
Baseline conventions score	0.55**	0.02
Grade 4	0.28**	0.06
Grade 5	0.20**	0.06
Intercept	-0.29**	0.09
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-166
HLM model results relating feedback scale with conventions score (3,037 writing samples from 315 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Feedback scale	0.03	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.28**	0.06
Grade 5	0.21**	0.06
Intercept	-0.25**	0.08
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-167
HLM model results relating how often teachers asked students to analyze what makes particular texts good or poor models of writing with conventions score (3,007 writing samples from 312 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students analyze what makes particular texts good or poor models of writing	0.03	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.28**	0.06
Grade 5	0.20**	0.06
Intercept	-0.24**	0.07
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-168
HLM model results relating minutes students spent writing per week with conventions score (2,946 writing samples from 306 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes students spend writing per week	0.03	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.28**	0.06
Grade 5	0.22**	0.06
Intercept	-0.23**	0.06
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-169
HLM model results relating minutes teachers spent teaching writing per week with conventions score (2,925 writing samples from 304 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Minutes teacher spends teaching writing per week	0.02	0.03
Baseline conventions score	0.57**	0.02
Grade 4	0.29**	0.06
Grade 5	0.20**	0.06
Intercept	-0.19**	0.06
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Exhibit B-170

HLM model results relating how often teachers asked students to write over an extended time frame with conventions score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over an extended time frame	0.02	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.26**	0.06
Grade 5	0.20**	0.06
Intercept	-0.23**	0.07
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.25	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-171

HLM model results relating how often teachers asked students to write over a shorter time frame with conventions score (3,083 writing samples from 320 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write over a shorter time frame	0.02	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.26**	0.06
Grade 5	0.20**	0.06
Intercept	-0.23*	0.10
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.17	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-172
HLM model results relating how often teachers asked students to write 1 or 2 sentences with conventions score (2,994 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 or 2 sentences	-0.02	0.02
Baseline conventions score	0.57**	0.02
Grade 4	0.27**	0.06
Grade 5	0.20**	0.06
Intercept	-0.03	0.15
Random Effects	**Variance Component**	
Student effect	0.98	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-173
HLM model results relating how often teachers asked students to write 1 paragraph with conventions score (2,984 writing samples from 310 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write 1 paragraph	0.02	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.27**	0.06
Grade 5	0.19**	0.06
Intercept	-0.29*	0.12
Random Effects	**Variance Component**	
Student effect	0.98	
School mean	0.16	
Teacher mean	0.25	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-174
HLM model results relating how often teachers asked students to write multiple related paragraphs of less than 2 pages with conventions score (2,993 writing samples from 311 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of less than 2 pages	0.03*	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.25**	0.06
Grade 5	0.17**	0.06
Intercept	-0.27**	0.08
Random Effects	**Variance Component**	
Student effect	0.98	
School mean	0.17	
Teacher mean	0.25	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-175
HLM model results relating how often teachers asked students to write multiple related paragraphs of 2 or more pages with conventions score (2,970 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
How often students write multiple related paragraphs of 2 or more pages	0.01	0.02
Baseline conventions score	0.57**	0.02
Grade 4	0.27**	0.06
Grade 5	0.20**	0.06
Intercept	-0.18**	0.06
Random Effects	**Variance Component**	
Student effect	0.98	
School mean	0.16	
Teacher mean	0.26	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.

Exhibit B-176

HLM model results relating teaching argument scale with conventions score (2,968 writing samples from 308 teachers in 42 schools)

Fixed Effects	Coefficient	*SE*
Teaching argument scale	0.02	0.02
Baseline conventions score	0.56**	0.02
Grade 4	0.26**	0.06
Grade 5	0.18**	0.06
Intercept	-0.22**	0.08
Random Effects	**Variance Component**	
Student effect	0.97	
School mean	0.18	
Teacher mean	0.25	

**p < 0.05, **p < 0.01*

Sources: SEED student writing prompts, SEED teacher surveys.