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LDC in Action: Learning Effects in a Large Urban District

POLICY BRIEF NO. 14

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Introduction

The Literacy Design Collaborative (LDC) was created in 2009 to support schools' implementation of rigorous college and career ready standards for English language arts (ELA). Combining evidence-based principles of professional development with a systematic design process, LDC helps teachers to embed literacy skill development throughout their content area curricula and promotes teachers' engagement in formative assessment and continuous improvement practices. UCLA's National Center for Research on Evaluation, Standards, and Student Testing (CRESST) has served as LDC's independent evaluator since 2011 and is currently completing a 5-year, nationally funded study of LDC's implementation and impact. This policy brief summarizes study results from a large, urban district on the West Coast. The brief starts with background on LDC and study methodology and then shares study findings, which demonstrate LDC's substantial effects on student learning. (More detailed results from the study are available in two CRESST reports, Wang et al., 2019, and Wang et al., 2020.)

Background on LDC

College and career readiness standards (CCRS) raised the bar on what students are expected to learn (Johnson & Wells, 2017) and consequently demanded changes in existing teacher practices to facilitate such learning (Darling-Hammond et al., 2014; Supovitz, 2015). For ELA, teachers were asked to shift their practices to support their students in being able to read critically, use evidence-based arguments, and communicate clearly orally and in writing. All of these changes pose a challenge to teachers who may have never been exposed to these practices in the past as either a learner or a teacher (Edgerton & Desimone, 2018; Pak, Desimone, & Parsons, 2020).

LDC was designed to help teachers meet this challenge. It empowers teachers with task templates, ongoing training (Desimone, 2009), and other tools to create and implement challenging standards-based modules, which can be seamlessly embedded in ongoing curriculum. The units culminate in a content-oriented, evidence-based writing assignment that draws on unit readings and feature an instructional ladder designed to help students build the literacy and content understanding skills they will need for unit success.

LDC thus addresses one of the key shifts demanded by CCRS, that students engage with complex, content-rich texts across multiple disciplines (Chadwick, 2015), and its design supports a variety of learning outcomes. Research, for example, demonstrates that the integration of literacy and disciplinary instruction serves to increase students' content knowledge, vocabulary, reading comprehension, and writing skill (Cervetti et al., 2012; Duesbery et al., 2011; Reisman, 2012). Further, by encouraging and assisting content area teachers to integrate literacy standards into their courses, LDC both deepens students' content understanding (Carter et al., 2007; Cervetti et al., 2012; Draper, 2008; Klein & Kirkpatrick, 2010; Monte-Sano & De La Paz, 2012; Wissinger & De La Paz, 2016) and helps make literacy development a shared responsibility among both teachers and administrators, who can assign resources and develop school policies to support reform (Shanahan & Shanahan, 2008; Supovitz, 2015).

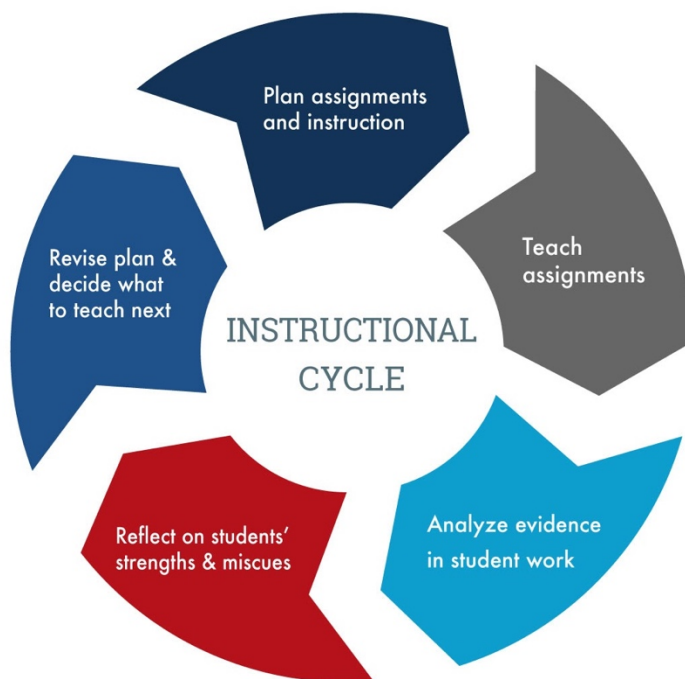
LDC uses backward mapping as a key and well-established design principle (Graff, 2011; Wiggins & McTighe, 2005). After identifying a high-quality, culminating writing assignment incorporating both disciplinary standards and CCRS, teachers chart the specific knowledge and skills that students will need for success on the assignment. The teacher forms an instructional ladder of reading and other activities that will help students develop the requisite knowledge and skills by keeping in mind the learning goal, the necessary steps to achieve the goal, and the vision of high-quality performance while planning and enacting lessons (Ball, 2000).

The LDC design process serves as the overarching framework of practice for an extended school-based, teacher professional development program that incorporates web-based training and learning supports.¹ Through the LDC CoreTools platform and on-site professional learning communities, teachers have opportunities to share representations, practice decompositions, view approximations of practice, and learn to use specific scaffolds and approaches to instruction (Grossman et al., 2009). These activities are all important since research shows that standards-based reforms can pose both technical challenges in aligning curriculum and adaptive challenges in adjusting teachers' rigor and practices (Pak, Polikoff, et al., 2020; Supovitz, 2015), and one way to confront these challenges involves ongoing professional development that is content focused, and provides opportunities for sense-making (Desimone, 2009; Edgerton & Desimone, 2018; Spillane, 1999).

¹ LDC implementation varies from individual teacher-based to school- or other group-based, but the I3 study reported here used a school-based model.

As they participate in the LDC professional learning community, use LDC supports, and enact LDC-infused instruction, teachers also move through cycles of continuous learning and improvement, as depicted in Figure 1. Teachers begin by planning assignments and instruction, which they then implement in their classrooms (Bell & Cowie, 2001; Black & Wiliam, 2009; Heritage et al., 2009; Ruiz-Primo & Furtak, 2007). The modules offer teachers multiple opportunities to assess students' learning progress and to identify any gaps or misunderstandings (Bell & Cowie, 2001; Black & Wiliam, 2009; Hattie & Timperley, 2007; Heritage et al., 2009; Ruiz-Primo & Furtak, 2007; Sadler, 1989). Teachers then are encouraged to use these data both to revise their modules and to plan subsequent instruction for their students, using effective formative assessment practices (Bell & Cowie, 2001; Black & Wiliam, 2009; Ruiz-Primo & Furtak, 2007; Sadler, 1989).

FIGURE 1 - LDC Instructional Cycle



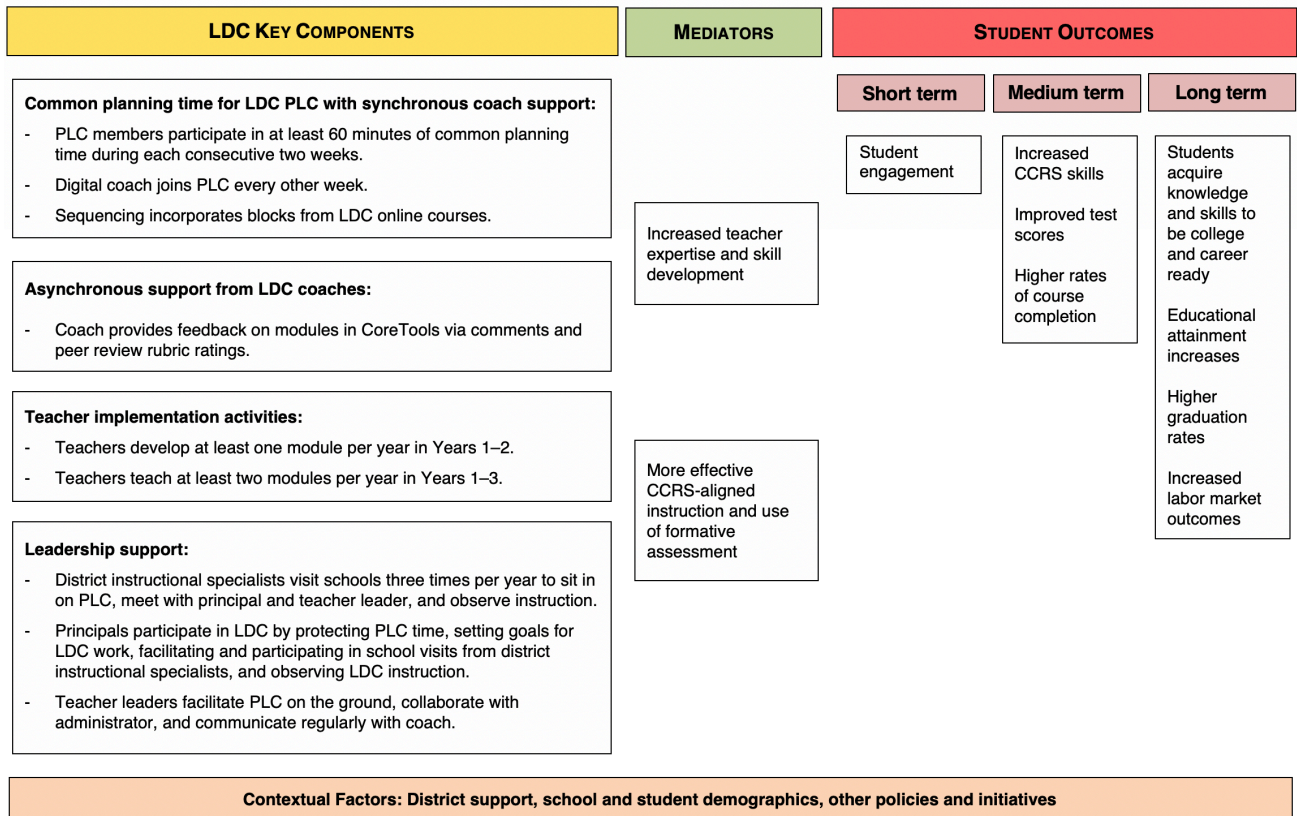
The LDC implementation model for the I3 study reported here assured that participating teachers at each school had dedicated, common planning time; regular support from LDC coaches; and a school-based LDC coordinator. The model also specified LDC's expectations for schools' and teachers' participation, as shown in the study's logic model (see Figure 2). Available research concerning job-embedded learning (Croft et al., 2010; Zepeda, 2019), professional learning communities and teacher collaboration (Akiba & Liang, 2016; Darling-Hammond et al., 2009; Goddard et al., 2007; Lomos et al., 2011; Patrick, 2013; Ronfeldt et al., 2015; Vangrieken et

al., 2015; Vescio et al., 2008), teacher coaching (Allen et al., 2011; Cohen et al., 2020; Desimone & Pak, 2017; Kraft et al., 2018; Matsumura et al., 2010; Neuman & Cunningham, 2009), and the role of leadership in school reform (Desimone et al., 2019; Porter et al., 2000; Supovitz, 2015) demonstrates that LDC's core components can be drivers of change in both teacher practice and student learning:

- coach-supported **professional learning communities** formed at each school site to plan and support implementation of the LDC intervention and to provide a space for teacher learning and collaboration;
- **asynchronous support from coaches**, primarily in the form of review and feedback through the CoreTools platform;
- **teacher implementation activities**, including the creation/adaptation and classroom implementation of two LDC modules; and
- **leadership support** at different levels with school and teacher leaders engaged in a process of goal setting, observation, and reflection related to the LDC work.

LDC's CoreTools online platform, with its module-building tools and extensive library of exemplars, tools, templates, and resources, provides the technological base for teachers' work.

FIGURE 2 - LDC i3 Logic Model



The logic model predicts that these four components will lead to increased teacher pedagogical expertise and more effective CCRS-aligned instruction that incorporates ongoing formative assessment. In turn, this increased teacher capacity and more effective instruction will lead to higher student engagement in the short term; and improvements in student skill acquisition and test scores, and higher rates of course completion in the medium term, after 2 years of implementation. In the long term, LDC will improve students' college and career readiness, education attainment, graduation rates, and labor market outcomes. The logic model provided the conceptual foundation for the evaluation study.

Evaluation Methodology

The evaluation focused on teachers and their students in 37 district schools serving elementary and/or middle school grades, who participated in the study for at least 2 years. Schools and selected teachers within them entered the study in two cohorts; 20 Cohort 1 schools initially joined at the beginning of the 2016–2017 school year, and 31 Cohort 2 schools joined in 2017–2018. As of the final year of the study, 2018–2019, 11 of the original Cohort 1 schools were continuing to participate (3 Cohort 1 schools were not participating in LDC any more), as well as 23 of the original Cohort 2 schools.

Study data included a range of implementation measures, including teacher and leadership surveys, CoreTools processes data, analysis of teacher-created LDC units, and archival information on attendance and selected operations of LDC professional learning communities.

LDC's impact on student learning was gauged by a rigorous, quasi-experimental design using sophisticated statistical methodology. The analyses compared LDC students' performance on Smarter Balanced, the state accountability test, in English language arts to that of a specially selected control group of students who were similar at baseline to the LDC group in demographic characteristics and prior achievement at both the school and individual student level. The study design meets the What Works Clearinghouse standards for rigorous research.

Study Findings

In the following sections, we summarize study results organized by three categories of evaluation questions: What were the characteristics of the LDC sample? How well was LDC implemented? What were the effects of LDC on student learning? Unless otherwise indicated, the results are based on data from the study’s final year, 2018–2019, and combine results from both study cohorts.

What Were the Characteristics of the LDC Sample?

As Table 1 shows, the final study sample included 11 Cohort 1 schools, which began implementation during 2016–2017, and 23 Cohort 2 schools, which started at the beginning of the 2017–2018 school year. In Table 1, we provide a snapshot of school participation in 2018–2019, the final implementation year. In 2018–2019, the majority of participants were from elementary schools and Cohort 2 schools.

TABLE 1 - Number of Schools and Participants in 2018–2019 by Cohort and School Level

	Elem	K-8	Middle	6-12	High	Total
Cohort 1 Schools	7	0	3	0	1	11
Cohort 2 Schools	16	2	4	1	0	23
Cohort 1 Participants	48	0	23	0	9	80
Cohort 2 Participants	155	21	35	21	0	232

The data in Table 2 show that more than three quarters of the study students were of Hispanic origin and nearly 90% were characterized as “in poverty,” based on eligibility for free or reduced-price lunch. Black students comprised 10% of the sample, and Asian and White students constituted a lesser percentage, with 17% classified as limited English proficient and 11% and 14% categorized as special education and gifted respectively. Our analysis revealed these school and student characteristics were similar to those for the district as a whole. However, students in LDC schools also were slightly more likely to be living in poverty, and were slightly lower performing than all those in district schools serving students in Grades 3–8.

TABLE 2 - Characteristics of 2018–2019 LDC Schools and Grades 3–8 Student Population at LDC Schools Compared to the District as a Whole

Variable	LDC Sample	Whole District
Number of Students	15,953	237,728
Student Level Characteristics		
Hispanic (%)	77	72
Black (%)	10	8
Asian/Pacific Islander (%)	4	6
White (%)	7	11
Female (%)	49	49
Limited English proficient (%)	17	18
Special education (%)	11	12
Gifted (%)	14	15
Free or reduced-price lunch (%)	87	84
Student Achievement ^a		
Mean standardized ELA achievement	-0.08	0.00
Mean standardized math achievement	-0.06	0.00

^a Due to missing data, the number of students with achievement data is slightly smaller. For LDC, the ELA was 14,587 students and the math sample was 14,696 students. Correspondingly, the district ELA and math samples were 219,795 and 221,550 students respectively.

How Well Was LDC Implemented?

Our evaluation foci mirrored the LDC logic model, as shown in Figure 2 above. Overall, the evidence suggests that implementation was generally faithful to the intended structure of LDC, although the level of implementation was not uniformly high. Nonetheless across the 3 study years, teachers and administrators consistently reported positive attitudes toward LDC and its implementation at their schools.

PROFESSIONAL LEARNING COMMUNITY (PLC) COLLABORATION AND IMPLEMENTATION SUPPORT

The frequency of PLC meetings varied greatly across schools, with some PLCs struggling to meet frequently and ensure high attendance, but a majority were able to achieve the “every two weeks” goal and found their collaboration with peers helpful. Teachers were nearly uniform in reporting that their PLC teacher leaders were supportive, knowledgeable, and helpful. Teacher leaders similarly reported high satisfaction with support from coaches, professional development offerings, and how the teacher leader role allowed them to be instructional leaders in their schools.

TEACHER CLASSROOM LDC IMPLEMENTATION

Program data indicated that nearly all teachers participated in module building, and for many this involved collaboration and adaptation of existing LDC modules, rather than creation of new ones. Most teachers also reported implementing multiple modules across the school year, as LDC expected. The degree of teacher engagement, however, varied substantially, as did module quality, based on data from CoreTools and our module analysis.

SUPPORT FROM COACHES

Teachers nearly uniformly praised their LDC coaches for the training and implementation guidance they provided and found their coaches' feedback useful to their teaching practices. However, our CoreTools analyses revealed that coaches did not use CoreTools as much as expected to provide feedback to teachers. Coaches met LDC minimum feedback expectations on 60% of the modules by providing at least two comments on each teacher module.

LEADERSHIP SUPPORT

Teachers also were almost universally positive about the support, encouragement, and feedback they received from their teacher leaders. School administrators were seen as generally supportive of the program, but their level of participation varied greatly across the sample. While school attrition rates speak to uneven leadership support, most schools that remained in the program at the end of the study indicated that they would continue to use LDC practices and tools. School personnel generally perceived district leaders as supportive of LDC, but a number did not feel that district leaders fully understood the program.

LDC IMPACT ON TEACHER SKILL AND STANDARDS-BASED CURRICULUM

Teachers and school administrators uniformly felt that LDC had improved participants' instructional planning and pedagogical skills, particularly in the areas of focusing on and creating standards-based assignments. The great majority also reported that LDC had helped teachers strengthen their formative assessment practice by helping them collect, analyze, and use evidence of student progress to modify subsequent instruction. Respondents' views, furthermore, grew even more positive over time. Teachers and administrators also felt that LDC was improving student learning across multiple domains, in particular writing skills.

What Were the Effects of LDC on Student Learning?

Our quasi-experimental design analyses of student performance on Smarter Balanced confirmed both teachers’ and administrators’ positive views and LDC’s hypotheses that with 2 years of experience, teachers would produce impact on student learning. All study analyses favored LDC students compared to their carefully constructed control groups, and effects for middle school students’ scores were statistically significant. Cohort 2 middle school teachers and students, who benefited from a refined LDC training approach, showed particularly strong effects.

Our analyses employed two different approaches. The first model we termed “dosage dependent” because it took account of the reality that students, particularly at the middle school level, could vary in the number of LDC teachers they experienced—for example, they could have LDC teachers in English, social studies, and/or science. This model tests the extent to which students benefit from more exposure to LDC classes and teachers. The second approach we termed dosage independent because it considered all LDC students the same regardless of the number of LDC teachers they had. Study students were simply coded as exposed to LDC or not.

TABLE 3 – Impact of LDC on State English Language Arts Assessment Scores by School Level

School/teacher Level Samples with Two Years of LDC	LDC Analytical Sample Information			Dosage-dependent Model Coefficient (SD)
	Schools	Teachers	Students	
Cohorts 1 and 2 Elementary	17	34	685	0.028 (0.078)
Cohorts 1 and 2 Middle	11	54	3,294	0.281 (0.081)*
Cohorts 1 and 2 Elem and Middle	26	88	3,979	0.124 (0.054)*

Note. Full results can be found in our earlier reports: Wang et al., 2019; Wang et al., 2020.

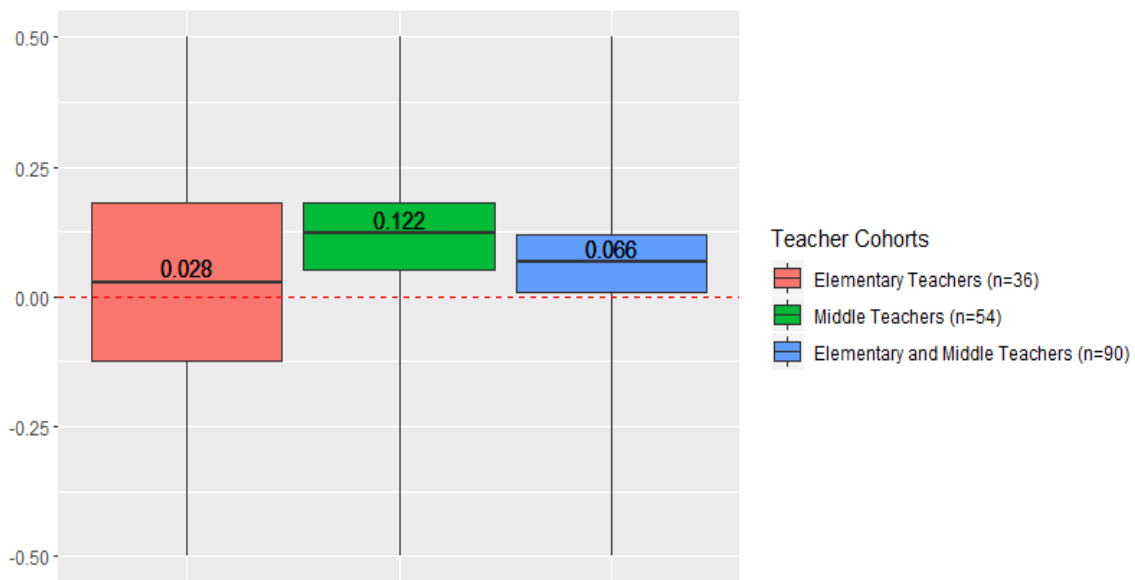
*p ≤ .05

For middle school students exposed to LDC instruction in ELA, social studies/history, and science, effect sizes translated to a striking 9.4 months of additional learning compared to similar peers. The effect size for the average observed student (who received a smaller dose of LDC instruction) translated to a still very impressive 4.1 months of additional learning compared to similar peers (see the green box plot in Figure 3).

Our analyses also examined the effects of common covariates on the performance of students whose teachers had 2 years of LDC experience. The effects of the covariates were similar under both models and were in the expected directions. Baseline ELA performance remained the strongest predictor and baseline mathematics performance also helped explain student outcomes. In addition to baseline achievement, Hispanic students, students receiving free or reduced-price lunch, and English language learner status were all significant predictors of ELA performance and were in the expected directions. Students enrolled in honors English courses performed at higher levels than did their peers taking standard English courses, and female students performed significantly higher. Students performed similarly in Cohort 1 and 2 schools.

Finally, Figure 3 depicts the estimated impact of LDC for students exposed to LDC teachers in all three major content areas: ELA, social studies/history, and science. Results are shown by school level and combined and again highlight LDC effects at the middle school level. These effect sizes can be best understood as the estimated impact of LDC under ideal conditions.

FIGURE 3 - Treatment Effect on Smarter Balanced English Language Arts Scores with 95% Credibility Interval for Students with Average LDC Dosage, by Cohort



Summary and Conclusions

In summary, our multiyear, mixed-methods evaluation of LDC implementation in a large, West Coast urban school district provides evidence that LDC instruction improves student learning, particularly at the middle school level where results were statistically significant. Students taught by teachers with 2 consecutive years of LDC participation scored at significantly higher levels on their state accountability test in English language arts than the comparison group of carefully matched students in similar schools in the same district. The observed effect translates to 9.4 months of additional learning for students exposed to LDC in all their core content areas (English, history, science), and 4.1 months of additional learning for the average observed student in the study. The dosage-dependent model, in short, demonstrates well that middle school students with higher levels of exposure to LDC (by being taught by teachers in multiple content areas implementing LDC) benefited more from the program. It is also worth underscoring that LDC achieved these significant effects in a low-performing urban setting, where students of color and students living in poverty comprised the great majority of the study's student sample, and a moderate proportion were not fully English proficient.

Teachers were nearly uniform in their positive attitudes about the value of their LDC participation. Educators found LDC to be a helpful tool for fostering collaboration, creating a safe space for sharing practice, and strengthening their instructional design and pedagogical skills in literacy development. Teachers reported that LDC had improved their standards-based practice and their students' learning, particularly in writing.

Despite broad support and demonstrated impact, however, our results indicate that many schools and teachers did not fully meet LDC fidelity thresholds. They did not fully participate in professional learning communities with the frequency and duration that LDC anticipated and did not fully meet expectations for module development and implementation. Moreover, a number of principals or other school leaders did not meet LDC expectations for their involvement, which was emblematic of inconsistent leadership support in some schools, for example in the critical area of common planning time. Survey results, in fact, identified school and district leadership support as a relative weakness in LDC implementation. The responses of sizable proportions of teachers and teacher leaders, for example, indicated that principals did not observe LDC teachers as expected and did not offer feedback or participate in LDC planning and implementation. Principal support, in these instances, thus was more hands-off than hands-on.

Yet strong leadership support is essential for the implementation of new programs and practices (Desimone et al., 2019; Porter et al., 2000; Supovitz, 2015), and it seems axiomatic that incomplete implementation hampers program impact. Study findings, in short, highlight the importance of school leaders and teachers understanding and committing to the program in advance of implementation, and the need for school leaders dedicating substantial attention and resources to the program.

That LDC demonstrated stronger effects at the middle school level also is noteworthy, mirroring research showing differences in the uptake of reforms for different groups of teachers (Edgerton & Desimone, 2018). In exploring these differences, LDC may wish to investigate strategies to increase its elementary school impact. Study findings on the effect of LDC dosage suggest that one key strategy lies in increasing elementary school students' engagement with LDC modules. That is, for typical elementary school classrooms taught by one teacher, study students had the opportunity to engage at most with two LDC modules over the course of the year, but at the middle school level, with different teachers for English, history/social studies, and science, students' potential engagement was six modules. Perhaps grade-level professional learning communities in elementary schools could be charged with developing or selecting larger pools of curriculum-appropriate modules in various subject areas for implementation in all grade-level classrooms and multiple subjects, thereby increasing students' exposure to LDC-infused instruction.

Study findings also underscore the value of all students' repeated immersion in LDC. LDC and implementing schools may want to consider how they can maximize students' LDC dosage, for example through cross-disciplinary grade-level teams and cross-grade disciplinary teams to embed LDC more fully within and across grades. Under these optimal conditions, LDC may show even greater impacts on teacher practice and student learning.

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