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LITERACY DESIGN COLLABORATIVE 2017–2018 EVALUATION REPORT FOR NEW YORK CITY DEPARTMENT OF EDUCATION

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Executive Summary

The Literacy Design Collaborative (LDC) was created to support teachers in implementing Common Core State Standards (CCSS) and embedding literacy skill development throughout content area curriculum. The LDC Investing in Innovation (i3) project focuses on developing teacher competencies through job-embedded professional development and the use of professional learning communities (PLCs). Teachers work collaboratively with coaches to further develop their expertise and design standards-driven, literacy-rich writing assignments within their existing curricula across all content areas.

Engaged in the evaluation of LDC tools since June 2011, UCLA's National Center for Research on Evaluation, Standards, and Student Testing (CRESST) is the independent evaluator for LDC's current federally funded i3 validation grant. CRESST's evaluation is using multiple data sources and a quasi-experimental design to examine LDC implementation and impact in two cohorts of schools in the New York City Department of Education (NYCDOE). Study schools serve largely Hispanic populations, with a high proportion of students qualifying for free and reduced lunch and many English language learners.

This annual report reflects the second year of implementation in 18 Cohort 1 schools, which began implementation in the 2016-2017, and the first year of implementation for 35 Cohort 2 schools, which commenced at the beginning of 2017-2018. The program experienced a high level of attrition among Cohort 1 participants and less than a fifth of the total 2017-2018 participants are teachers and administrators who participated in LDC in both 2016-2017 and 2017-2018. With so many new participants and program effects on student learning expected only after two years of implementation, this annual report should be considered an interim look at LDC progress. It is noteworthy as well that about 40% of participants were at elementary schools as that development represents an expansion of LDC's original focus on middle schools and teachers.

The CRESST evaluation addresses research questions in three major areas:

- Program Characteristics and Implementation
- Contextual Factors and Implementation
- Program Impacts

The following findings draw on multiple methods. These include surveys of teachers, teacher leaders, and administrators; the analysis of LDC modules, which are a central manifestation of LDC practice; participant interactions with LDC CoreTools, the electronic platform through which teachers access LDC professional development resources (online courses, existing LDC modules, module templates, and support for module development); LDC administrative records; and administrative data on students and teachers including class rosters, student demographics, and student performance on state standards-based assessments. We begin with overall findings and then move to summarize perspectives on key LDC components, intermediate effects on teachers' instructional strategies and practice, and effects on student outcomes. Detailed evidence with regards to key LDC activities, supports, and pedagogical impacts help to explain these positive findings and offer implications for further strengthening LDC.

Overall Findings

Findings from participant surveys reveal positive results for the LDC intervention, but thus far those positive findings on implementation have not been associated with statistically significant impacts on student test scores:

- Teacher, teacher leader, and administrator participants reported positive attitudes toward LDC. All measures of satisfaction or improvement were rated positively by more than half of the respondents. About two thirds of the teachers expressed interest in learning more about how to lead LDC implementation at their schools, and about 85% of both teacher leaders and administrators anticipated that their teachers would continue with LDC the following year.
- Participants across all groups perceived a positive impact on student outcomes. Approximately three quarters of teachers agreed that LDC helped improve students' reading skills, literacy performance, writing, and content knowledge. Administrator respondents were even more likely to report positive impacts on students, with about 90% reporting impact across different areas of learning.
- Analysis of student outcomes did not find the impacts of LDC on student learning to be significant with p-value at 0.05. The coefficient for our dosage dependent model measuring the impact of Cohort 2 middle school teachers was positive and close to, but not statistically significant. Coefficients for the other two analyses (of Cohort 1 returning middle school teachers and Cohort 2 elementary teachers) were very close to zero and not significant.

Professional Learning Community (PLC) and Teacher Collaboration

- Nearly all LDC teachers participated in LDC-oriented PLCs and 85% reported that their PLCs met at least every other week (the frequency expected by the LDC program). For teachers and teacher leaders, the most cited barrier to meeting every week was that PLC members had other priorities that competed with their participation.
- The frequency with which PLCs met varied across schools and teachers' individual attendance rates also varied greatly. Just under half of schools met attendance goals, with many schools experienced challenges related to protecting common planning time and ensuring that teacher participants regularly attended PLC meetings.
- Both teacher surveys and PLC reflection forms indicated that PLC meetings typically lasted 45 minutes to an hour or an hour or more, generally meeting the LDC standard.
- Teachers valued the collaborative nature of LDC and its PLCs. A large majority of teachers credited LDC with making them more likely to collaborate with other teachers, not only within their grade levels and content areas but outside of them as well.
- About three quarters of teachers reported that they had sufficient time to meet during PLC sessions, and over 70% felt that their administrators protected allocated resources to ensure that they could meet. However, the most frequently requested modification for future years was for more dedicated time during and outside of PLCs to plan modules, implement, and receive feedback about implementation.

LDC Training and Support

- Teachers were nearly uniform in their positive attitudes about the value of their PLC participation. They found the PLCs a safe space for sharing instructional plans, problem solving, and learning to develop modules.
- Teacher leaders were almost universally reported to be highly approachable, supportive, knowledgeable, and helpful, which suggests that programmatic changes made for 2017−2018 were successful. (During the 2017−2018 school year, local PLC leadership was assigned to the teacher leaders rather than the project liaisons, the teacher leaders were provided with a stipend, and principals and assistant principals were no longer permitted to play the role.)
- Teacher leaders reported high satisfaction regarding the support they received from coaches, professional development offerings, and how the teacher leader role allowed them to be instructional leaders in their schools.
- Overall, LDC coaches received positive feedback on the survey, with 99% of teachers and 100% of teacher leaders reporting that their coaches gave them appropriate and timely feedback and support. Data, however, suggest room for improvement when it comes to frequency and usefulness of coach feedback. Analysis of CoreTools analytic data revealed that about a quarter of modules did not receive the expected level of feedback via comments from coaches, while the peer review functionality was used

very infrequently. About one fifth of all teacher survey respondents reported either not using written feedback or not finding it useful.

- Most teachers rated CoreTools positively, demonstrating the success of changes LDC made prior to the 2017−2018 school year including further refinement of the content, sequencing, delivery of CoreTools' instructional content, and streamlining of participants' learning process. A majority of teachers found the online course materials clear, relevant, and useful and, contrary to last year, open-ended responses did not reference instructional content as a problem. Almost half of teachers, however, rated the ease of use of the online course material as either poor or fair, and a similar proportion did not find the videos useful. In addition, analysis of CoreTools data revealed that teachers were exposed to a small proportion of the online course content during their PLC time, which suggests that there wasn't sufficient PLC time to cover the content LDC intended participants to engage with.
- While 82% of teachers agreed that their school had adequate technology to support LDC implementation, many teachers noted in their open-ended responses that there were glitches in conducting Zoom meetings. Teachers also suggested the value of more in-person time with coaches.

LDC Implementation

- Teachers reported adapting two existing LDC modules and creating one LDC module from scratch on average, in addition to selecting and using mini-tasks outside of the modules; the average survey respondent therefore met LDC program expectations with regard to creation of modules. According to the survey data, the average teacher reported implementing more than two modules in their classrooms. Analysis of CoreTools data, however, show that less than 20% of teachers uploaded student work for two or more modules (an important proxy for classroom implementation).
- Analysis of program data suggests that while nearly all participants were engaging with the module-building platform, the level of engagement did vary greatly across individuals and across subgroups (role, cohort, school level, content area) as evidenced by the large variation in the number of views, edits, and comments. Analysis of module components found that two thirds of teachers failed to engage at a basic level by editing the teaching task, while a third of teachers met the fidelity threshold by editing multiple key portions of modules.
- The majority of teachers (75% to 92%) reported success in nine key areas of LDC module development. Teachers were most confident in selecting focus standards, creating the writing assignment, identifying skills needed in the module, and making writing assignments relevant and engaging. The module analysis, however, suggests that the materials adapted and created by PLC members varied in levels of completion and quality. and
- With regards to their classroom implementation of LDC modules, the majority of teachers reported success with all six key areas queried (81% to 88%). Teachers were most confident with engaging students in complex text, locating evidence of standards

in final student work, and engaging students in understanding the assignment and rubric. Despite teachers' reported confidence, if we use uploaded student work as an indicator, it appears that a majority of modules might not have been implemented in the classroom.

- Overall, module quality increased substantially from 2016-2017 to 2017-2018, particularly among elementary level modules. Looking just at 2017-2018 modules, elementary modules were on average higher quality than secondary modules.
- An exploratory look at module quality over time for teachers remaining in the program suggests some improvement from the prior year.

Leadership Support

- Almost all teachers and teacher leaders reported that their administrators encouraged LDC participation at the school. The majority of teachers and teacher leaders agreed with administrators that they allocated resources to ensure that LDC teachers could participate in meetings. Administrators generally voiced strong support for LDC, but there were differences with how active teachers and teacher leaders viewed that support. LDC may want to understand the differences in these perceptions better.
- There was great variation across schools in the extent to which administrators and teacher leaders took advantage of in-person professional development opportunities, and also the frequency of teacher leader/coach planning calls. Most schools did not meet fidelity thresholds on these indicators.
- Compared to uniformly positive ratings by school administrators on most items, their ratings of district support were relatively low. This too signals an area where LDC may need to strengthen its efforts.

Impact on Teacher Practice

- The majority of teachers reported improving their practice in seven LDC-related skills (73% to 85%). Teachers felt they learned most in selecting focus standards, creating standards-driven writing assignments, and identifying skills students need in writing assignments (skills concentrated at the beginning of the LDC learning cycle).
- Three quarters or more of teachers agreed that participating in LDC raised their expectations for students' writing, helped them incorporate writing assignments into their existing curriculum, and made them more likely to collaborate with other teachers on designing instruction.

Subgroup Effects

CoreTools analyses showed that teachers in Cohort 1 schools, both returning and new, engaged with the online platform at higher levels than teachers in Cohort 2 schools. Among the rated elementary modules, modules by Cohort 1 teachers scored higher on four out of the six dimensions. Among rated secondary modules, modules by Cohort 2 teachers had the highest scores. Survey results across multiple dimensions revealed on average more positive attitudes by Cohort 1 returning teachers than Cohort 1 new teachers and Cohort 2 teachers. Cohort 1

returning teachers found asynchronous support more helpful, reported producing greater numbers of modules, were more confident in their ability to design high quality LDC instruction, reported greater support from administrators, felt more empowered regarding their role in LDC implementation and expansion, and were more likely to report impact on both their own practice and student learning. Given that they were in their second year of implementation, many of these differences are not surprising and indeed welcome. Results for new participants in Cohort 1 schools highlight some challenges. These teachers were less likely to find their PLC to be effective and to perceive their administrator to be supportive of LDC.

Final Conclusions

LDC's second year of implementation shows the results of its continuous improvement efforts and a positive trajectory toward program success. Changes made based on last year's evaluation results—such as the further streamlining and refining of online courses and the changing of the school liaison role to that of a teacher leader—have paid off in greater participant satisfaction and greater fidelity to the program's logic model.

Evidence suggest that second year implementation was largely faithful to the structure of LDC's implementation model, although in many cases individual teachers and schools were not meeting implementation goals. Most PLCs met at least every other week as they were expected to do, but a sizable minority struggled to protect common planning time and ensure high attendance rates. Participants engaged with CoreTools resources, but to varying degrees. Coaches provided feedback through multiple mechanisms, and while PLC members reported appreciating this feedback, feedback was not uniform and not all teachers found it useful. Teachers also reported meeting LDC expectations for module development and implementation, although data from the CoreTools analyses suggest that, for many teachers, module development and implementation may not have been fully complete.

The data from all respondents' surveys, coupled with the analysis of module quality, suggest that LDC is benefiting most teachers' pedagogical skills and particularly their ability to integrate standards-based writing assignments and assessment into their curriculum. Respondents also perceive LDC to have positive results on student learning—particularly with regard to literacy skills and writing, although thus far exploratory quasi-experimental analyses have not revealed a statistically significant impact of LDC on student scores on state ELA assessments.

This year's results revealed some areas of challenge. While the majority of participants were satisfied and positive about the benefits of LDC, sizeable proportions were not in a number of areas. For example, while the great majority of teachers were confident and noted improvement in areas related to creating standards-based teaching and writing tasks, and evaluating them, sizable minorities were less confident about the specifics of planning lessons and practicing formative assessment. LDC should consider what can be done do to strengthen

their efforts in these areas and/or target further follow-up support for teachers during the coming year.

Adequate time was a frequently cited concern. Respondents voiced that they hoped for more collaborative time, more prep time, time before the start of the year, and/or compensated time. Technology also remained a problem for some participants. While some respondents were frustrated with technical problems that marred the experience of Zoom meetings, others would have simply preferred in-person rather than digital meetings with coaches. Participants also seem to have made relatively limited use of the CoreTools interactivity, for example with regard to commenting and revision. Some participants also reported frustration with CoreTools usability and the utility of its video resources.

Survey responses also suggest that leadership support needs continuing attention. Although teachers and teacher leaders were generally positive about their school leaders' knowledge of and support for LDC, these leaders did not seem to meet LDC's expectations for being involved in program implementation by observing and providing feedback to participants. Similarly, administrator responses suggested that district support was a relative weakness.

As we noted, this report presents interim findings, before most participants have had the two years of experience with the program that LDC believes they need to meet program goals. The findings at this point are definitely positive. The 2018−2019 school year will provide that crucial second year of experience and, barring unexpected attrition, strong data for fully examining the implementation and effects of LDC's i3 implementation, and the factors that contribute to LDC success.

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1.0 Introduction

The Literacy Design Collaborative (LDC) was created to support teachers in implementing Common Core State Standards (CCSS) by integrating literacy skill development throughout the content areas. The LDC Investing in Innovation (i3) project focuses on developing teacher competencies through job-embedded professional development and the use of professional learning communities (PLCs). Teachers work collaboratively with coaches to further develop their expertise and design standards-driven, literacy-rich writing assignments within their existing curriculum across all content areas. LDC is a national community of educators providing a teacher-designed and research-based framework, online tools, and resources for creating both literacy-rich assignments and courses across content areas. Used by individual teachers, schools, and districts in 40 states for the past four years, LDC also is a statewide adopted strategy for Common Core implementation in Kentucky, Colorado, Louisiana, and Georgia.

UCLA's National Center for Research on Evaluation, Standards, and Student Testing (CRESST), in collaboration with its partner Research for Action (RFA), engaged in the evaluation of LDC implementation and its impact on student learning and teacher effectiveness starting in June 2011, via two parallel research studies funded by the Bill and Melinda Gates Foundation. Those studies included an examination of LDC implementation in eighth grade social studies and science classrooms in Kentucky and Pennsylvania and a districtwide implementation in sixth grade advanced reading classes in a large district in Florida. Results for the studies are available in two CRESST reports (Herman et al., 2015a; Herman et al., 2015b), as well as a journal article published by AERA Open (Herman, Epstein, & Leon, 2016).

Currently, CRESST serves as the independent evaluator for LDC's federally funded Investing in Innovation (i3) validation grant. The LDC i3 study is examining the implementation and impact of LDC in two large urban school districts: New York City Department of Education (NYCDOE) and a large school district on the West Coast (the former of which this report is focused on). The evaluation study is a comprehensive mixed-methods evaluation to understand the impact of LDC on student learning using a quasi-experimental design, as well as to

document LDC's impact on teacher skills and practices. Specifically, the evaluation study addresses a rich range of questions about program characteristics, conditions, and impacts in the context of two large urban school districts. The study draws on data from two cohorts of schools, with each school housing a PLC of teachers who engage in professional learning about LDC and implement LDC mini-tasks and modules in their classrooms. The study measures teacher implementation and skill improvement with teacher surveys, analytic data from LDC's online CoreTools module building platform, artifact analysis, and LDC administrative records. While we document the core strategies of the LDC model as implemented and provide support for LDC improvement, the central focus of our comprehensive mixed-methods evaluation is examining the impact of LDC on teacher practices and student learning using a quasi-experimental design.

The first i3 evaluation cohort of schools began implementing LDC during the 2016–2017 school year, and the second cohort of schools began implementing LDC during the 2017-2018 school year. This annual progress report examines LDC implementation during the 2017–2018 school year in NYCDOE. A parallel progress report focuses on implementation in a large district on the West Coast (Wang, et al, 2019). The current annual progress report presents results from (a) surveys of LDC classroom teachers, teacher leaders, and school administrators; (b) analyses describing how LDC participants interacted with the CoreTools module building platform; (c) rating by CRESST of instructional modules created by LDC participants; (d) analysis of the fidelity of implementation across multiple key components, indicators, and data sources; and (e) student outcome analyses using the quasi-experimental design.

Survey results provide a window into how LDC was implemented in 2017−2018, the perceived utility and effectiveness of various program components, and the perceived impact of LDC on both teacher and student skills and knowledge. The analysis of CoreTools user data and modules created and adapted by teachers provide evidence on the level of engagement with the online platform and module design process, and the quality of the products created by the teachers and PLCs. Fidelity of implementation analysis, utilizing the fidelity matrix designed collaboratively by LDC and CRESST, provides a broad picture of how schools and the program performed on key fidelity indicators in 2017-2018. Exploratory analyses of the effectiveness of LDC in increasing student learning for Cohort 1 schools with two years of LDC implementation and Cohort 2 schools with one year of implementation are also included in the report. The confirmatory analysis will be conducted next year by pooling data on teachers from both Cohort 1 and 2 schools who implemented LDC in two consecutive years and their students.

1.1 Logic Model

The logic model includes four key intervention components that are predicted to be the drivers of change in teacher practice and student learning (see Figure 1.1). These are a coach-supported **Professional Learning Community (PLC)** formed to implement the LDC intervention at the school site and provide a space for teacher collaboration; **asynchronous support from**

coaches primarily in the form of feedback in CoreTools through comments and peer review; **implementation activities** completed by participating teachers including module development and classroom implementation; and **leadership support** at different levels. Note that the model also indicates LDC's expectations for the level of implementation in each area.

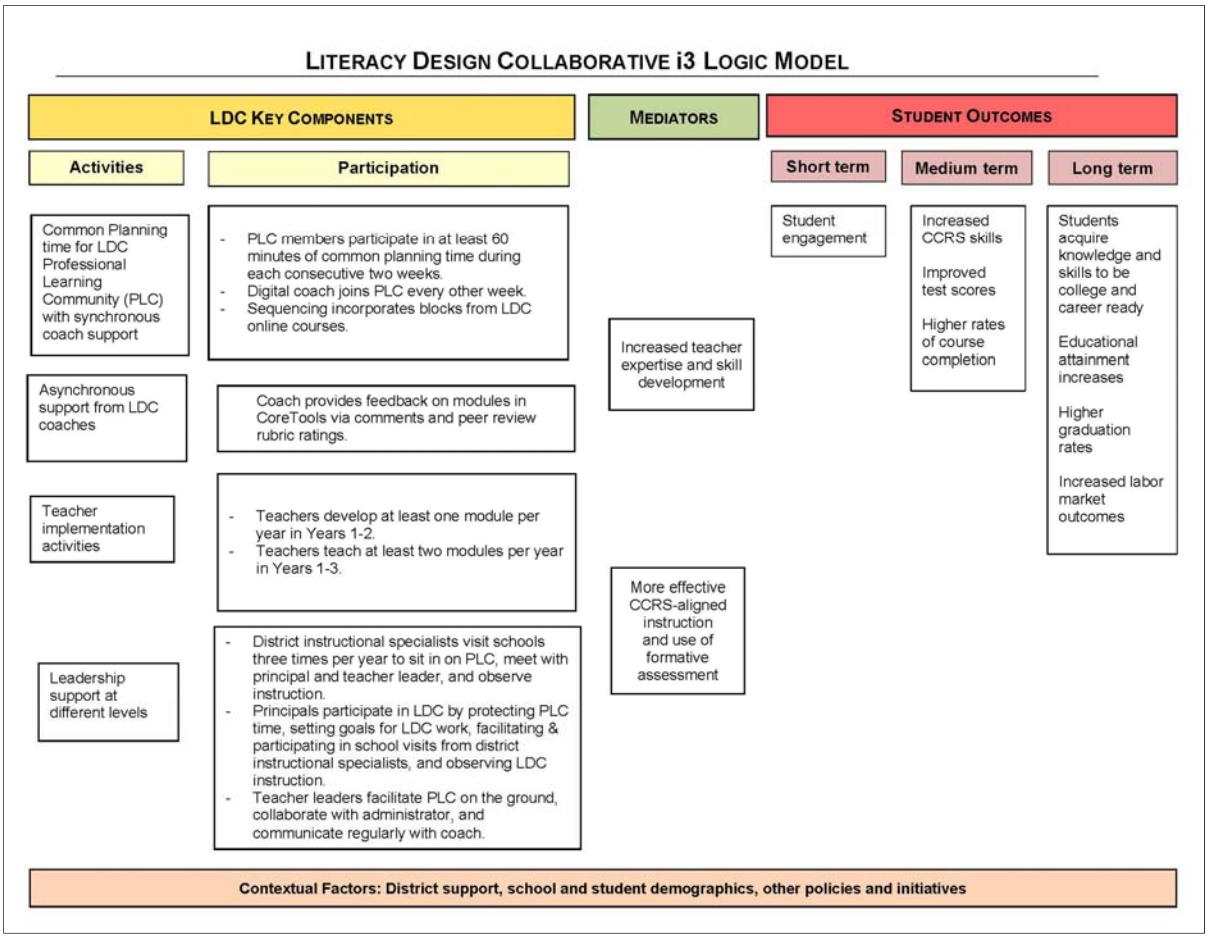

Figure 1.1. LDC i3 logic model.

The logic model predicts that the four key components will lead to increased teacher expertise and skill development, and more effective Common Core aligned instruction which incorporates ongoing formative assessment. In turn, increased teacher capacity and more effective instruction will lead to increased student engagement in the short term; increased student skill acquisition, higher test scores, and higher rates of course completion in the medium term; and improved college and career readiness, education attainment, graduation rates, and labor market outcomes in the long term.

Note that the logic model was revised based on refinements to the program in response to learning from the pilot year (2015–2016) and the first year of Cohort 1's implementation (2016–2017).

1.2 Evaluation Questions

Our evaluation questions focus on addressing three main areas: program characteristics and implementation, contextual factors and implementation, and program impacts. This progress report provides findings on many, but not all, of the evaluation questions. In particular, there is limited information available regarding program impacts. This report provides an *exploratory* look at how the refined LDC model is impacting the learning of students under Cohort 1 teachers in their second year of implementation and Cohort 2 teachers in their first year of implementation. The *confirmatory* analysis will be conducted after year 2 data are available for both cohorts of schools/teachers; that analysis will first be shared in next year's annual report.

1. Program Characteristics and Implementation
    a. Who are the participating teachers and schools? Are they representative of the teacher/school populations of the respective district on years of teaching, education level, prior student performance, etc.?
    b. How is the LDC program implemented in each district? What are the core components (e.g., training, tools, on-site or other direct support) and who are the key participants? In what ways did the LDC implementation align with the intended model?
    c. In what ways do teachers implement the LDC tools in their classrooms? To what extent do teacher practices align with intended LDC practices?
    d. How are teachers utilizing the online LDC system (including online tools, exemplars, collaborative work spaces, and technical assistance) in terms of frequency and use of key features? Does this vary by teacher characteristics? What are teachers' perceptions of the value and quality of the online LDC system?
    e. What types of LDC professional development opportunities are offered to and utilized by teachers at each school/district? Are teachers and schools satisfied with the LDC professional development opportunities they received?
2. Contextual Factors and Implementation
    a. What factors facilitate or hinder successful implementation of the LDC model at the teacher, school, and district levels?
    b. How can implementation of the model be improved at the teacher, school, and district levels?
    c. What other educational reforms are being implemented in the participating schools and districts? What are their influences on the LDC adoption in the schools and districts? Are schools able to align reform efforts?
    d. What are the roles of school and district leadership in shaping the LDC implementation?

3. Program Impacts
    a. What is the impact of LDC on the academic performance of participating students as measured by the state assessments?
    b. Do the academic impacts vary by student subgroup including prior achievement, race, ethnicity, socioeconomic status, gender, language proficiency, and/or disability? Does LDC help close the achievement gap between student subgroups?
    c. Do the academic impacts vary by student grade level or subject?
    d. What is the impact of LDC on teacher skill improvement and learning as measured by CoreTools and by the quality of LDC modules they produce? What is the self-reported impact of LDC on teacher learning?
    e. To what extent do teachers report changes in their practice (e.g., teaching strategy, collaboration with others) and changes in their comfort in implementing CCSS during and after the LDC intervention?
    f. What is the relationship between the fidelity of implementation, fidelity of intervention, and student learning? What are the conditions and contexts under which LDC tool use is most effective?
    g. To what extent do Cohort 1 participating schools and teachers continue their LDC-influenced practices in the 2019–2020 school year after the LDC support ends? What contributed to their decision to continue or stop? What factors contributed to their levels of continued implementation? How does Cohort 1's actions align with their previously stated intentions for continuation of LDC-influenced practices as reported in spring 2017? To what extent do Cohort 2 participating schools and teachers plan to continue their LDC-influenced practices after the LDC support ends?

2.0 Study Methodology

In this chapter, we provide an overview of the methodology we used. We begin by describing the various instruments and data sources we used for the study, including surveys of classroom teachers and teacher leaders participating in PLCs and administrators overseeing the implementation; analytic data from LDC's CoreTools platform; module artifacts including samples of student work; LDC administrative data; and administrative data on students and teachers used for outcomes analyses. We then describe the sample of educators and schools for each of these data sources. Finally, we discuss the methodological approaches for the various analyses we conducted.

2.1 Data and Instruments

We next describe each of the data instruments and the elements they contain. Most variables are measured at the teacher level, which is the unit at which the LDC intervention is being implemented. Administrative data for the analysis of the impact of LDC on student learning includes school, teacher, and student level variables.

Surveys (teachers, teacher leaders, and administrators). In 2017−2018, four different surveys were administered to LDC participants playing three different roles: teacher, teacher leader, and administrator. Some teacher leaders were classroom teachers who implemented LDC with their students, while other teacher leaders were out of classroom faculty (coaches or coordinators); these two groups received different versions of the survey tailored to their roles. Thus, four versions of the surveys were administered in spring 2018: (1) teacher, (2) teacher leader (for coaches and coordinators), (3) teacher leader (for teachers), and (4) administrator.

In collaboration with LDC, CRESST made minor revisions to the 2016−2017 surveys. These refinements involved streamlining the language of certain questions, in particular those capturing teacher pedagogical practice and the perceived impacts of LDC on teachers and students. In a few cases, questions and items were also added to collect systematic information on program conditions and impacts that were observed by LDC and CRESST anecdotally.

The surveys were designed to capture multiple perspectives on key aspects of LDC's logic model (see Figure 1.1),1 and to provide data to answer the evaluation's research questions presented earlier. Survey questions targeted at the three roles fall under the domains and subdomains in Table 2.1. Domains were selected to align with the LDC i3 logic model and with the CRESST evaluation questions. Note that most domains cover multiple subdomains, constructs, and survey questions. Professional Learning Community/Teacher Collaboration, for example, captures the intensity, frequency, and collaborative environment of common planning time; LDC Training and Support includes quality of online courses, utility and effectiveness of

[1]The survey domains were aligned to this version of the logic model for the pilot year. The logic model has since been revised to align with the revised LDC implementation plan.

coach support, etc.; and LDC Implementation encompasses module creation, classroom implementation of modules, and module peer review.

Table 2.1

Survey Domains for Three Respondent Groups

Domain	Teacher	Teacher Leader	Administrator
LDC Participation	X	X	X
Professional Learning Community and Teacher Collaboration	X	X	X
LDC Training and Support	X	X	X
LDC Implementation			
Module Creation	X	X	
Classroom Implementation	X		
Module Peer Review	X		
Alignment		X	X
Leadership Support			
Teacher Leader Support	X		
School Administrator Support / Classroom Observation	X	X	X
Teacher Leader Leadership Role	X	X	X
District Support		X	X
Impact			
Impact on Teacher Practice and Learning	X		X
Impact on Student Learning	X		X
Scale-Up and Sustainability		X	X
Facilitators and Barriers	X		
Areas of Improvement	X	X	X

Teachers and administrators were asked to reflect on both LDC's Impact on Teacher Practice and Learning and Impact on Student Learning. Questions within a number of domains further asked respondents to reflect on conditions and supports that may potentially impact LDC's implementation. These domains included teachers' perceptions of Facilitators and Barriers to implementation and perceptions regarding leadership roles and support for LDC at different levels. Teacher leaders and administrators were also asked for their perceptions regarding if and how LDC would be sustained and expanded within the school. Finally, all respondents were asked open-ended questions regarding Areas of Improvement for LDC

implementation. Teacher, teacher leader, and administrator surveys can be found in Appendices A, B, and C.

LDC CoreTools. The CRESST team received the LDC program data on i3 participants' interactions with the CoreTools module-building platform. The data files captured a number of behaviors including document page viewing, document editing, document commenting, coach use of peer review, exposure to instructional content found in the "Learn" tab in CoreTools, and uploading of student work. The data contained date- and time-stamped records of participants' activities in all of these areas.

Using these data files, we were able to analyze variation in the number of times participants viewed, edited, and commented on documents across the school year. We generated descriptive statistics (minimum, maximum, mean, and standard deviation) for the number of times participants viewed a document page, edited a module document, and commented on a module document. We then produced descriptive statistics on these behaviors for each role group (teacher, teacher leader, and administrator), school level (elementary, K-8, middle, 6-12, and high), cohort, and content area subgroups. We also compared the average engagement in these key activities across two groups: teachers who completed and taught LDC modules (as indicated by the upload of student work samples) and those teachers for whom there wasn't evidence of module implementation. The results on these metrics of engagement are reported in Chapter 4.

CoreTools data were also used to analyze to what extent: teachers were exposed to instructional cycles of LEARN content; coaches provided feedback via commenting and peer review functions; teachers edited key portions of modules; and teachers uploaded student work (a proxy for classroom implementation). Results for these indicators are reported in Chapter 6.

Modules. Our existing module rating rubrics (Reisman, Herman, Luskin, & Epstein, 2013) were designed to examine the instructional quality and coherence of the LDC modules, and to address the rigor in both content and literacy development materials (i.e., template task, student work samples, and descriptions of the pacing and goals of the modules). The first two dimensions examined the quality of the teaching task, while the remaining four dimensions focused more holistically on module quality: 1) effective writing task; 2) alignment to the CCSS and local and state literacy and content standards; 3) fidelity to LDC module instruction; 4) quality instructional strategies; 5) coherence and clarity of module; and, 6) overall impression. Each of the dimensions was rated using a five-point scale with anchor points on the first five dimensions ranging from not present or realized to fully present or realized and the final dimension ranging from inadequate to advanced LDC module implementation. For each dimension, a one represented the lowest possible level of quality, while a five represented the highest level of quality (see Appendix D for the scoring rubrics).

LDC Administrative Records. The fidelity matrix analyses in Chapter 6 utilize administrative records collected by LDC as part of their ongoing program management. These records include (1) PLC Reflection forms, and (2) attendance records for in-person meetings organized for the benefit of school administrators and teacher leaders. The PLC Reflection form captures attendance at regular PLC meetings, the amount of time spent on LDC during these meetings, whether teacher leaders had a separate planning call with coaches, and the subjects that PLCs were working on during sessions.

Administrative data used in student outcomes analysis. Student-level variables utilized in the outcome analysis included race/ethnicity, gender, poverty status, special education status, English language proficiency, grade, and prior achievement in mathematics and ELA and outcome year achievement in ELA on state assessments. The analysis also utilized a measure of years of teaching experience. We also requested and received roster files that establish a link between teachers and students via specific courses.

2.2 Sample

Twenty Cohort 1 schools began implementing the LDC program in the 2016–2017 school year, with 219 classroom teachers participating and 47 administrators overseeing the work (see Table 2.2). The 29 Cohort 1 schools included two elementary schools, four K-8, 17 middle, three 6-12, and three high schools. The program, however, experienced a high level of attrition from 2016-2017 to 2017-2018, as summarized in Table 2.2. Over a third of schools dropped out of the program after 2016-2017, and there was also substantial attrition within the remaining schools. In total over three quarters of the teachers participating in LDC in 2016-2017 were no longer participating in 2017-2018.

Table 2.2

Attrition of Cohort 1 Teachers, Administrators, and Schools

	Teachers	Administrators	Schools
Participated in LDC in 2016-2017	219	47	29
Dropped out of LDC after 2016-2017	166	25	11
Remained in LDC in 2017-2018	52	22	18
Attrition Rate	76%	53%	38%

To better understand teacher retention rates at LDC schools after the 2016-2017 school year, we conducted an interview study of school administrators in both NYCDOE and the West Coast district we are also studying. Twenty principals and assistant principals volunteered to be interviewed. The principal interviews reveal the diversity of reasons behind schools' varying success in retaining teachers. The main factor in explaining variation in teacher retention was teacher and grade-level team decisions to leave or stay, followed by the principals' decision to

switch participation of teachers from year 1 to year 2. Teacher buy-in also seemed to affect teachers' decisions on whether to continue. Appendix E described the results in detail as well as the methodology for the study.

A new cohort of schools started in the 2017-2018 school year. Cohort 2 included 35 schools new to LDC in 2017-2018, which were comprised of 16 elementary schools, 11 middle schools, five K-8 schools, and three 6-12 schools. Because of the high level of attrition in Cohort 1 and the greater number of recruited schools in Cohort 2, two thirds of the participating teachers and administrators in 2017-2018 were from Cohort 2. There was also a group of 68 new participants who joined existing Cohort 1 PLCs in 2017-2018. Table 2.3 shows the number of participants in 2017-2018 by cohort category and school level.

Table 2.3

Number of Participants by Cohort and School Level, 2017-2018

	Elementary	K-8	Middle	6-12	High	Total Participants
Cohort 1 Returning Participant	10	10	40	9	5	74
Cohort 1 New Participant	10	6	41	9	2	68
Cohort 2 Participant	147	34	79	23	0	283
Total Participants	167	50	160	41	7	425

In addition to the CoreTools analytic files, we also received module artifacts from LDC for an analysis of the quality of module design. We restricted our analysis to modules that were created during the 2017-2018 school year and included original uploaded student work samples, because these samples were considered a proxy for implementation in the classroom and were required for scoring modules. That restriction yielded a pool of 307 modules that were authored or coauthored by 249 teachers (over half of all participating teachers), across 49 schools. To align with our research questions and to have analyzed modules be representative of the teacher sample, we sampled the last module created by each teacher wherein they served as the sole or lead author. Our intent was to represent teachers' best LDC work, and presumably modules created later in the school year would be more skilled than those created earlier. The total sample was 141 modules. Table 2.4 provides further detail about the distribution of modules. We also conducted an exploratory analysis of the five elementary teachers and 14 secondary teachers who created a complete module both this year and during the previous school year.

Table 2.4

Distribution of Modules Rated by Grade Band, Cohort, and Subject

Variables	Elementary		Secondary		Total	
	#	%	#	%	#	%
Cohort						
Cohort 1 Returning	10	15.38	22	28.95	32	22.70
Cohort 1 New	2	3.07	21	27.63	22	15.60
Cohort 2	54	83.07	33	43.42	87	61.70
Subject						
ELA	34	52.31	44	57.89	78	55.32
Science	9	13.85	9	11.84	18	12.76
Social Studies	22	33.85	23	30.26	45	31.91
Total	**65**	**46.10**	**76**	**53.90**	**141**	**100.00**

We now turn to Table 2.5, which displays the sample sizes for the different study measures and analyses included in this report. The population includes 2017-2018 participants in all three cohort categories (Cohort 1 returning participant, Cohort 1 new participant, and Cohort 2 participant). As can be seen, data were available for a majority of the 2017-2018 participants for each of the measures and analyses. Sixty-nine percent of teachers consented to participate in the study, with 67% of all teachers completing the survey in spring 2018. The consent rate for administrators (79%) was higher than that of teachers while the survey response rate for administrators (28%) was much lower than the teacher rate. Nearly all teachers (91%) and most administrators (73%) were present in the CoreTools dataset, which was delivered to CRESST directly by LDC and did not depend on teachers' individual study consents. Almost three quarters of teachers were associated with the modules we studied in our artifact analysis.

Table 2.5

Number of Participating Schools and Teachers in the District and Sample Size for Different Instruments

	Number of classroom teachers	Number of administrators	Number of schools in which teachers and administrators practice
Participated in LDC	345	80	53
Consented to CRESST study	237	63	49
Completed survey	231	22	47
Present in CoreTools dataset	315	58	51
Author/coauthor of module with student work uploaded	249	1	49
Included in outcomes analysis	111	N/A	34

The school district required individually signed consent forms before releasing teacher data and teacher/student rosters, so for the outcome analysis, we only received data on teachers who consented to participate in the study. As described later, there was sufficient data to be able to conduct three exploratory quasi-experimental analyses for this report, testing the impact of returning Cohort 1 returning middle school teachers, Cohort 2 elementary school teachers, and Cohort 2 middle school teachers. The final row in Table 2.5 reflects the number of unique teachers and schools that were represented in these three analyses. There was insufficient student sample size to conduct analyses of the impact of Cohort 1 new participants or Cohort 1 returning elementary school participants, so the teachers in those groups were not included in analyses.

The sample was further restricted by the need for student achievement data for both the outcome year (2017-2018) and the baseline year (2015-2016). As a result, participants teaching either in high school or lower elementary grades (K-3) could not be included in the student outcome analyses. Middle school teachers not teaching a core ELA, social studies/history, or science class also were not included in the analyses. Overall, due to all these restrictions, the three outcome analyses are based together on a little under a third of the teachers that were participating in LDC in 2017-2018.

2.3 Survey Recruitment and Administration

As noted above, one third of the participant sample in 2017-2018 was made up of teachers and administrators from Cohort 1 schools; many of the consent forms from those participants had successfully been collected by CRESST in 2016-2017.Consent forms were collected in person, at PLC meetings via video conference, and over emails. The consent forms included language stating that the study was voluntary, all data would be protected, and that by signing the form, participants gave their consent to be emailed an electronic survey in spring 2018 and their permission for CRESST to request district data that link the teacher to students.

Directly compensating educators for participation in research is not permitted in New York State. We therefore offered instead gift cards of $300 to the school to be used for school supplies to directly benefit students. The gift cards were given to the school if the school's teacher leader and at least five teachers participating in the PLC completed the survey.

Surveys were administered in spring 2018. CRESST coordinated with LDC staff and coaches to administer the online surveys during PLC sessions. Multiple email reminders were sent to participants who were not present at the common planning session or who otherwise did not complete the survey. The teacher survey was closed at the end of the school year in June 2018. Administrator surveys were left open until October of the new school year, with LDC staff conducting outreach to administrators in an effort to boost response rates.

2.4 Module Scoring Process

LDC requirements specified that all teachers implement at least two modules over the course of the year, with the first spanning one week based on one text and the second spanning across multiple weeks and incorporating multiple texts. Modules could be developed as original units of work or could be adapted from existing modules within the LDC CoreTools Library. Modules could also be either developed or adapted in solo or collaboratively with other teachers within the PLC.

LDC modules were collected from elementary and secondary teachers who participated in LDC during the 2017–2018 school year. As stated previously, to align with our research questions and to have the modules be representative of the teacher sample, it was decided to rate the last module created by a teacher (as a first author) that included the required materials. In total, 141 modules created by NYCDOE teachers were rated with 46 or 32.6% being rated by two panelists. Further details about the modules can be found in Appendix F.

Seven expert raters with experience teaching in the targeted grade spans and content areas were recruited from Los Angeles county schools. Four panels were convened with two experts rating each of the following sets of modules: elementary ELA and social science, elementary and secondary science, secondary ELA, and secondary social science. One of the seven expert rater served on both the secondary ELA and the secondary social science panels because of her wide range of experience.

Separate trainings lasting approximately two hours were conducted for each module scoring panel. All trainings were conducted by a member of the evaluation team who is an expert on the Common Core and the rating of student and teacher artifacts. The training included an overview of the LDC goals, template task, the structure of the modules, and the CRESST rating dimensions. Once the training was complete, calibration was conducted by having teachers individually score and then discuss their ratings for one module in the content area on which they would be focusing. Scoring was then conducted on subsequent days with each module individually rated. Those modules rated by two expert teachers were then discussed with the goal, but not the requirement to reach consensus (see Carlson & McCaslin,

2003). All discussions were facilitated by the same evaluation team member who conducted the initial training.

2.5 Analytical Approaches

Both quantitative and qualitative analytic methodologies were applied to the data to answer the evaluation questions about how LDC was implemented, conditions affecting implementation, and program impacts. The following describes the approaches used to analyze each data set.

Surveys. Survey responses were analyzed using descriptive statistics for multiple-choice items and qualitative coding for open-ended responses. As previously noted, surveys were administered to teachers, teacher leaders, and administrators. Some teacher leaders were classroom teachers while others were coaches or coordinators. Because of this, the samples were not mutually exclusive, with teacher leaders who taught in the classroom represented in both the teacher and teacher leader results. Generally, we report the number and percentage of respondents who selected different multiple-choice options. In a few cases, where responses are numerical rather than categorical, we present means rather than proportions. Descriptive statistics for all multiple-choice items are presented in full in Appendix A for teachers, Appendix B for teacher leaders, and Appendix C for administrators. Responses are organized by domain and specific questions are identified by question number. For example, we summarize the domain of LDC participation in one section, but rely on information from four questions. We preface teacher questions with "T," teacher leader with "TL," and administrator questions with "A".

LDC CoreTools. The first stage of our analysis examined the proportion of all participants who created CoreTools user accounts, and engaged in three key behaviors: viewing, editing, and commenting on modules. We then analyzed each of the three key measures of participants' interaction with the LDC online tools, and reported frequencies and/or descriptive statistics (e.g., minimum, maximum, mean, standard deviation) as measures of participants' engagement with the online LDC system. In addition to reporting the overall results, we provide results by cohort, the content area taught (ELA, social studies/history, or science), participant role (teacher, teacher leader, and administrator), and school level (elementary, K–8, middle, 6–12, and high) whenever feasible. Finally, we explored the difference in CoreTools engagement between two groups of teachers: those that completed and taught modules and those who did not appear to complete the design and implementation process.

Modules. We used descriptive statistics (means, standard deviations, and percentages) to analyze overall and subgroup performance for each content area and school level on each of the six dimensions. Additionally, generalizability theory (G theory) was used to examine potential sources of error during the rating process to help determine the validity of the scores as well as the construct validity of the rubrics (see Shavelson & Webb, 1991). Finally, teacher

comments during the debriefings were examined to determine other potential issues with the rubrics and/or rating process.

Fidelity of implementation analysis. Fidelity of implementation analysis involved descriptive analyses of a variety of data sources. LDC and CRESST staff worked collaboratively to construct the fidelity matrix, with LDC staff setting the thresholds for adequate implementation on each indicator and at each level of implementation (teacher/module, school, and program). Although the process produces school level fidelity scores for all indicators, the initial unit of implementation was either module, teacher, or school depending on the indicator.

Three indicators were based on data collected via CRESST's teacher survey. Data on these selected survey items were used to produce school- and program-level fidelity scores. For one of the three survey-based indicators (perceived effectiveness of engagement in LDC on teacher competencies), we created an index variable by averaging across multiple items. Three indicators were based on data from the PLC Reflection Form collected by LDC, which was filled out by teacher leaders at the school level and used to capture information on both full PLC sessions and one-on-one planning and progress calls between the teacher leader and coach. Two indicators were based on LDC administrative records capturing attendance by teacher leaders and administrators at in-person meetings occurring four times per year. Finally, six indicators were based on LDC's CoreTools analytic data capturing a variety of behaviors including teachers' viewing of LDC online course content in the LEARN portion of CoreTools, editing of modules, and uploading of student work; and coaches' commenting and providing peer review on modules.

The fidelity matrix can be found in Appendix G. The matrix outlines a process whereby fidelity scores on each indicator are computed for each school, and for the program as a whole. The matrix also produces a score for whether the program met fidelity for each of the four components. As described in detail in the fidelity matrix in Appendix G, schools were rated on four-point scales (from 0 to 3) on each indicator. At the school level, adequate implementation was defined as a score of at least 2 (with the exception of principal mini-task observation where school-level fidelity was set at a score level of 1). For many of the indicators, the four-point scale was based on the proportion of teachers who met a certain implementation threshold. In order for the program as a whole to meet fidelity on a particular indicator, a certain proportion of schools had to meet the school-level threshold. For the indicators under Key Component 2, program-level fidelity was met if half or more of the schools met fidelity. For all of the other indicators (under Key Components 1, 3, and 4) program-level fidelity was met if three quarters of schools met fidelity.

Table 2.6 summarizes the matrix indicators, and the criteria for meeting school and program level fidelity.

Table 2.6

Summary of Fidelity Matrix Indicators and the Criteria for Meeting School and Program Level Fidelity

Key component	Indicator	Criterion for Meeting Fidelity at School Level	% of Schools Meeting Fidelity Needed to Meet Fidelity at Program Level
Key Component 1: Common Planning Time for LDC Professional Learning Community with Synchronous Coach Support	Teacher attendance at weekly PLC meetings	75% of PLC teachers attended 80% of meetings	75
	Amount of time spent on LDC in PLC sessions	PLC sessions typically met for 60 minutes plus	75
	Exposure to LDC LEARN content during 1st instructional cycle	75% of PLC teachers viewed 60% of sessions in 1st LEARN instructional cycle	75
	Exposure to LDC LEARN content during 2nd instructional cycle	75% of PLC teachers viewed 60% of sessions in 2nd LEARN instructional cycle	75
	Perceived effectiveness of engagement in PLC on teacher competencies	Teacher survey respondents on average reported moderate improvement in key competencies	75
Key Component 2: Asynchronous Support from LDC Coaches	Coach comments on modules	75% of modules developed at the school and linked to LEARN courses received at least two comments from LDC coaches	50
	Coach formative peer review on modules	75% of modules developed at school and linked to LEARN courses received feedback from LDC coaches via peer review rubric	50
	Teacher perception of the helpfulness of coach written feedback on modules	75% of teacher survey respondents reported coach written feedback was at least moderately helpful	50
Key Component 3: Teacher Implementation Activities	Module editing	75% of PLC teachers edited task and either standards or text in at least 1 module	75
	Module implementation	75% of PLC teachers uploaded student work to at least 2 modules	75
Key Component 4: Leadership Support at Different Levels	Frequency of coach/teacher leader monthly meetings	Teacher leaders had at least 9 planning / progress calls with coaches in school year	75
	Administrator attendance at quarterly in-person administrator meetings	School administrator participated in at least 2 out of 3 in-person meetings	75
	Teacher leader attendance at quarterly in-person teacher leader meetings	Teacher leader participated in at least 2 out of 3 in-person meeting	75
	Principal mini-task observation	75% of teacher survey respondents reported having their LDC instruction observed by a school administrator	75

Student outcomes. We employed a quasi-experimental design to examine the effect of LDC on the New York State ELA assessment scores of students in the participating LDC elementary and middle schools in 2017–2018. Before conducting the analysis, we used a two-step matching process to identify a reduced pool of comparison students and teachers at schools with similar characteristics to the schools in the intervention sample.

To accomplish this, we first identified the five most similar control schools for each intervention school based on a Euclidian distance measure, by using the nearest neighbor analysis option in SPSS 24.0 (see Fix & Hodges, 1951; Wang, Neskovic, & Cooper). The variables used in this process were the percentage of students eligible for free or reduced price lunch, the percentage of African American students, mean prior student achievement in ELA, mean prior student achievement in math, the average attendance rate of teachers, the percentage of teachers with three or fewer years of teaching experience, and the school grade span where feasible. Once the pool of comparison schools was identified, their students and teachers were also identified and student-level matching was conducted so that the resulting student sample would resemble the type of sample one would expect to obtain through random assignment.

The student-level matching technique we employed was coarsened exact matching (CEM) (Iacus, King & Porro, 2011). CEM is a flexible matching approach with many favorable properties, and allows the researcher to specify the precise conditions under which students are matched. For categorical variables, such as race/ethnicity or free or reduced price lunch status, this can entail exact matching, while for continuous measures, such as prior individual student achievement and aggregate class level achievement, cut-points for matching can be specified. With this approach we were able to set precise cut-points on the most important prior indicators, such as prior academic achievement, to ensure that where possible every treatment student was matched with a suitable comparison. Student matching variables we used in CEM included Hispanic, Black, poverty status, female, English language proficiency (English language learner), special education status, mean prior achievement in math and ELA, and grade level.

During matching we also included a few variables capturing information on the teachers and peers to which students were exposed. These variables included mean prior ELA achievement of the student's peers in her core content classes, and the average years of teaching experience of student's core content teachers.

The typical structure of course taking at the middle school level involves students potentially being exposed to multiple teachers, with each responsible for a different core content class. Specifically, middle school students in the study had exposure opportunities across three content areas (ELA, social studies/history, and science) taught by intervention teachers. As a result, students were not necessarily nested under individual teachers, but instead were likely to have connections to multiple teachers in the available time period prior to each testing outcome (students at the elementary school level were also sometimes exposed to multiple teachers but to a lesser extent). Therefore, LDC effects were estimated using an

extension of the standard multilevel modeling framework known as multiple membership multiple classification (MMMC) models (Browne, Goldstein, & Rasbash, 2001).

These models can account for complex classification structures, such as the LDC context, in which students are nested within schools but are also members of multiple classes led by different teachers who may or may not be implementing LDC. MMMC has the flexibility to account for this type of complex nesting structure in which students are hierarchically nested under schools but may have one-to-many relationships with teachers. There are three classification levels in the models we employ: students, teachers, and schools. In the MMMC modeling approach, each observation at the lowest level represents one student. Figure 2.1 shows how students can be exposed to teachers in different content areas, who may or may not be participating in LDC. Our MMMC modeling approach can account for this complicated structure.

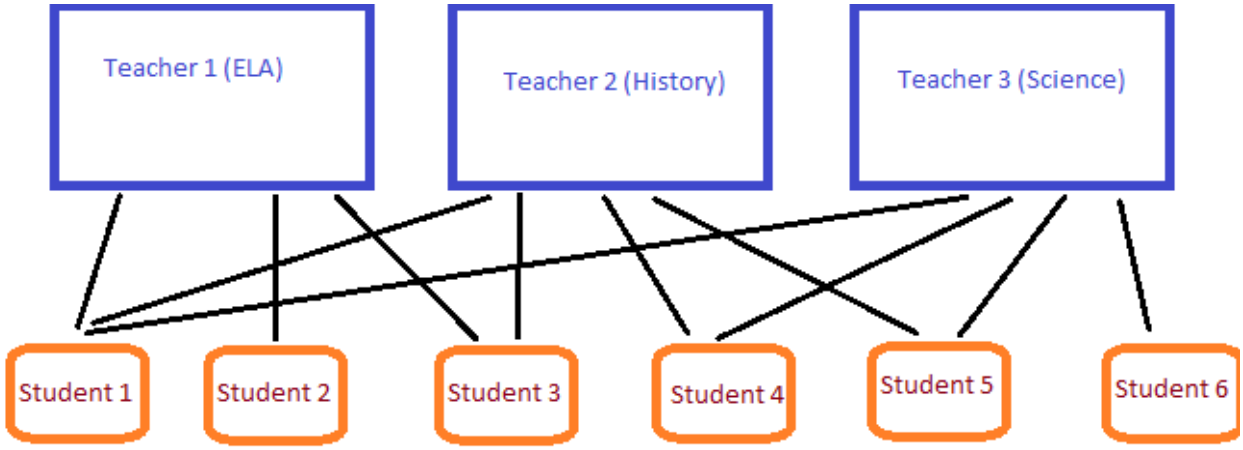

Figure 2.1. Variation in Student Exposure to Teachers

In the MMMC modeling approach, each observation at the lowest level represents one student. The weight each teacher receives with respect to each student is dependent on the student's exposure to his or her teachers in each of the three core content areas. The total student exposure adds to a unity (i.e., a possible total exposure of 1) across their courses in the three content areas in a given school year. While this general weighting approach applies to both elementary and middle schools, the course structure of the datasets required us to use different weighting procedures in elementary and middle school.

In both the elementary and middle school datasets, students were linked to teachers through statewide course identifiers and accompanying beginning and ending dates specifying the time each student was enrolled in a given course under a specified teacher. Students could potentially have data records connected to multiple teachers covering varying time periods in the same course. For each of the three core content courses we then collapsed the links into a

single measure of the days of potential content exposure preceding the assessment period. The codes aligning with the three core content areas of interest for our study were based on the School Codes for Exchange of Data (SCED) code handbook. In elementary school, in the event that a student was exposed to more than one teacher, each content area was given equal weight in distributing teacher/student exposure. For example, if a student was enrolled for both ELA and social studies/history under one teacher, then that teacher was coded as .67 for having contributed to two thirds of the students' core curriculum exposure. If the same student enrolled in science with a different teacher than the one who was linked to their course marks in ELA and social studies/history, then that science teacher would have been coded as .33 and all other teachers in the sample would have been coded as zero. This would then result in the student's exposure adding to a unity (1).

In middle school, students' exposure to teachers at the course level in the three core content areas was coded in the same manner as in the elementary grades based on enrolled time preceding the assessment period. A difference in our middle school coding process was that we did not force each core content area into equal weighting. Instead each core content area exposure contributed to a core content area total sum which formed the basis from which the weights were proportioned. Most commonly a student had equivalent days of core instruction exposure in each the three content areas (often 215 days in each content area). In that scenario, if a student had exposure to three different teachers, then each teacher would contribute one third (.33) of the overall core curriculum exposure and all other teachers in the sample would be coded as zero. However, in addition to the typical core science course, extra core science courses were also included in the LDC analysis (for example a Grade 8 student taking biology), which made it possible then for a student to accumulate more units in science than in the other two content areas. The weighting in middle school was always distributed as a proportion of the total exposure days in the three content areas. Therefore, if a student accumulated 300 science days (across two courses), two hundred social studies days, and two hundred ELA days, the base number of instruction days would be 700 days. If, using that same scenario, the same teacher taught both the typical core and biology courses then that teacher would contribute three-sevenths (.43) of the overall core curriculum exposure with the social studies and science teachers contributing two-sevenths (.285) each, again resulting in the student's exposure adding to a unity (1). Tabular versions of the above examples can be seen in Appendix G.

For this study, we modeled the treatment intervention variable as a fixed effect at the student level in two different ways. The first dosage dependent approach takes into account the students' level of exposure to the intervention teachers. In this approach, the treatment was structured as a continuous response variable, coded as zero for comparison students and coded as a positive value for treated students, albeit never exceeding one. The positive value assigned to treated students in the dosage-dependent approach was simply the sum of the intervention teacher weights linked to the treated student. The second approach was dosage

independent and classified any student exposed to an intervention teacher via at least one course as a treated individual. In this approach the treatment variable was dichotomous (coded as one for treated students and zero for comparison students).

As with other multilevel models, MMMC models account for the non-independence of observations within cluster by adjusting the inferences on parameter estimates for the correlations between responses in a cluster. This modeling approach, however, becomes computationally cumbersome using traditional frequentist estimation methods. As recommended by Browne et al. (2001) we instead employed Bayesian methods using Monte Carlo Markov chain (MCMC) techniques to best address this issue. Multilevel models incorporate demographic and achievement variables used in the matching design as covariates, making the findings "double robust" (characteristics controlled for in both matching and outcomes analysis stages). Student demographic and prior achievement variables that were used in the matching process were also included as covariates in the MMMC model. In the elementary analysis, the variable for grade level did not meet our inclusion criteria (the p value was >0.20), and was not included in the final elementary models. Full model specifications can be found in Appendix G.

3.0 Survey Analysis

In this chapter we present the survey results. First, we summarize teachers' responses. We then summarize the teacher leaders' responses, followed by the administrators' responses.2 Whenever we felt a comment from an open-ended response might clarify, illustrate, or corroborate a finding, we included that comment in the appropriate section. Within each of these sections, we organize results by the following domains: LDC participation; professional learning community and teacher collaboration; LDC training and support; LDC module implementation; leadership support; impact; and issues of scale-up and sustainability and facilitators and barriers. The last section summarizes the results about program efficacy and improvement, which were completed by all three participant types. We end with a summary of results.

As previously noted, we use acronyms to identify which participants answered specific questions for each domain. We preface teacher items with "T," teacher leader with "TL," and administrator questions with "A." For example, LDC Participation (T1–4) indicates that teacher survey items 1–4 are used to provide information on LDC participation. Survey questions and descriptive results are presented in full in Appendix A for teachers, Appendix B for teacher leaders, and Appendix C for administrators.

3.1 Teacher Survey Results

A total of 231 teachers at 45 schools completed the survey. Ninety teachers (39%) taught in 14 elementary schools, 34 teachers (15%) taught in eight K–8 schools, 79 teachers (34%) taught in in 18 middle schools, and 28 teachers (12%) taught in 5 6-12 schools (see Table 3.1). By cohort, 35 teachers (15%) were returning teachers from last year (Cohort 1 returning), 47 teachers (20%) were new teachers in Cohort 1 schools (Cohort 1 new), and 149 (65%) were new teachers from new schools (Cohort 2).

In addition to producing descriptive statistics on the overall sample, we also analyzed results separately for elementary and secondary level teachers and by cohort. We highlight important differences between these subgroups, when they are apparent. Note however, that observed differences must be treated with caution, given the overlapping membership within the categories. That is, cohort differences are confounded with elementary versus secondary comparisons given that Cohort 2 schools were much more likely than Cohort 1 schools to be elementary. Cohort 1 versus Cohort 2 comparisons also are complicated by the presence of a substantial number of Cohort 1 new teachers, whose schools are in their second year of implementation but who personally are in their first year of implementation. Further these teachers were sometimes joining PLCs that started in 2016-2017 and sometimes in completely reconstituted PLCs in returning schools.

[2]As noted earlier, some of the teacher leaders were also classroom teachers, coaches, or coordinators. Because of this, some teacher leaders were represented in both the teacher leader and classroom teacher samples.

Table 3.1

Schools and Teachers Completing the Survey in 2017–2018

School type	N of schools	N of Cohort 1 returning teachers	N of Cohort 1 new teachers	N of Cohort 2 teachers	Total Teachers
Elementary schools	14	8	4	78	90
K–8 schools	8	6	4	24	34
Middle schools	18	15	30	34	79
6–12 schools	5	6	9	13	28
Total	45	35	47	149	231

Secondary teachers reported teaching 1 to 20 classes (mean = 4.6) and using LDC materials in 0 to 13 classes (mean = 2.9). Forty-four percent reported using LDC in ELA; 40% in history/social studies; 21% in science; 12% in other areas (arts, languages, P.E.); and 1% in mathematics (see Table 3.1).

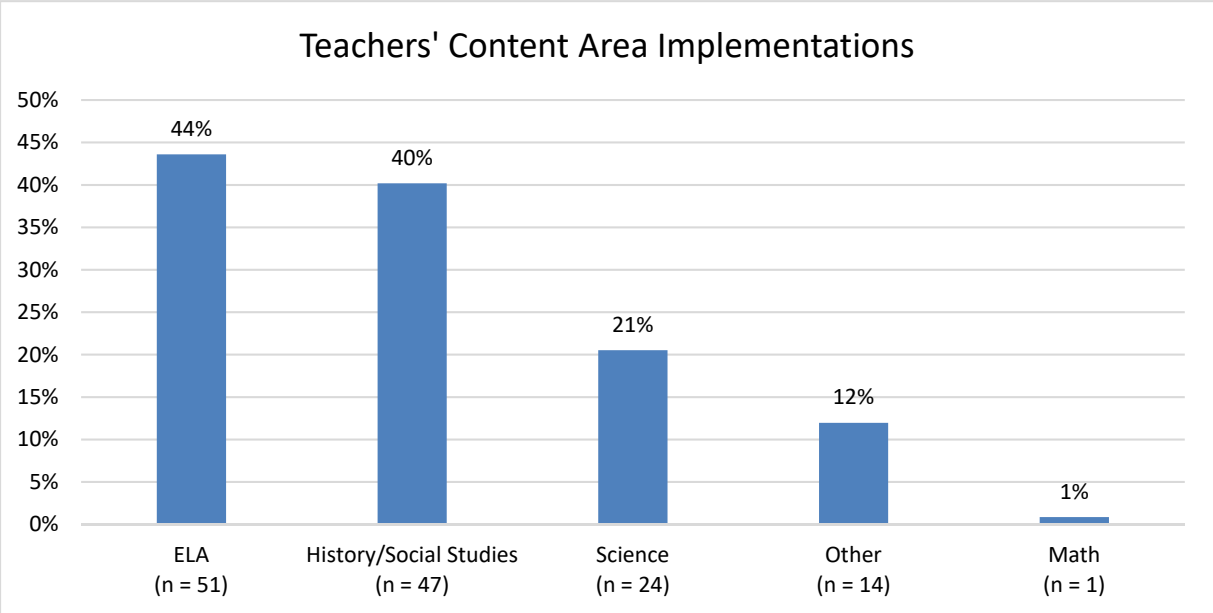

Figure 3.1. Teachers' content area implementations.

LDC participation (T1–4). Over three quarters of responding teachers (78%) reported that 2017-2018 was their first experience with LDC. The remaining 52 teachers (23%), reported that they had previously used LDC tools and averaged teaching over two modules in the prior year (mean = 2.4), with a wide range of 0 to 5 modules. These teachers also reported teaching over

three mini tasks outside of the modules in the prior year (mean = 3.6), with a range of 0 to 20 mini-tasks.

Professional learning community and teacher collaboration (T5–9, T31, T38). Almost all teachers (92%) participated in a PLC focused at least partly on implementing LDC. Of the 17 teachers who had not participated in a PLC, two teachers reported that they did not use any LDC tools in their planning or instruction, while 15 teachers (88%) reported they had used LDC tools in their planning or instruction. Of these 15 teachers, 11 used CoreTools to access modules; nine used CoreTools to design modules; six were given modules by other teachers; and four took online LDC courses. We hypothesize that these 15 teachers, given their engagement, may have partially participated in the PLC, perhaps by initially attending meetings and later dropping out.

Half of the teachers (51%) met with their PLCs once a week. Nearly a third (30%) met every other week, and a small percentage (15%) reported meeting monthly. Seven teachers (4%) reported meeting twice a week or more often, and one teacher (1%) reported meeting less than once a month. The most common reason cited for not meeting weekly was that PLC members had other priorities (61%). Other, less frequently cited reasons were lack of protected PLC time (14%); not a priority of the administration (7%); lack of participating teachers (4%); limited interest in attending meetings (2%); and not enough support from the teacher leader (1%).

The majority of teachers reported that LDC PLC meetings lasted 45 minutes or more: 58% reported meetings of 45 minutes to an hour (with 71% of elementary teachers meeting for this amount of time, compared to 47% of secondary teachers), and 22% reported that meetings lasted longer than an hour. Twenty percent reported meetings of less than 45 minutes. A majority of teachers (74%) *agreed* or *strongly agreed* that their PLCs were given sufficient time to meet. However, in the open-ended responses, 65 teachers (36% of 179 teacher commenters) indicated that time was a barrier to effective implementation. These comments included time issues, such as regularity of meetings and the need for teachers to have time outside of regular formal meetings to discuss and implement LDC, as well as suggestions for training to start earlier.

Beyond formal PLC meetings, half of teachers (50%) said they had informal discussions about LDC with their colleagues once a week or more; 18% every other week; 18% once a month; and 14% less than once a month.

Teachers also were positive about the effects of their PLC participation on their collaboration with other teachers. A majority of teachers (84%) *agreed* or *strongly agreed* that after participating in LDC they were more likely to collaborate with other teachers on designing instruction. Over three quarters (79%) reported that participating in LDC helped them develop working relationships with teachers in different grades or subjects. Sixty percent reported sharing their LDC work with colleagues who were not in LDC.

LDC Training and Support (T10–T13). Teachers evaluated the three primary types of training and support offered by LDC: PLC time, online course materials, and virtual coach support during and outside of PLCs.

Teachers found PLCs to be *moderately* or *very effective* in the following ways: creating an environment in which teachers were comfortable working with each other (94%); fostering an environment where teachers shared instructional plans with colleagues (92%); allowing space for shared problem solving (90%); and helping teachers learn to develop modules (89%) (see Figure 3.2). Cohort 1 new teachers were slightly less likely to report that their PLC was effective.

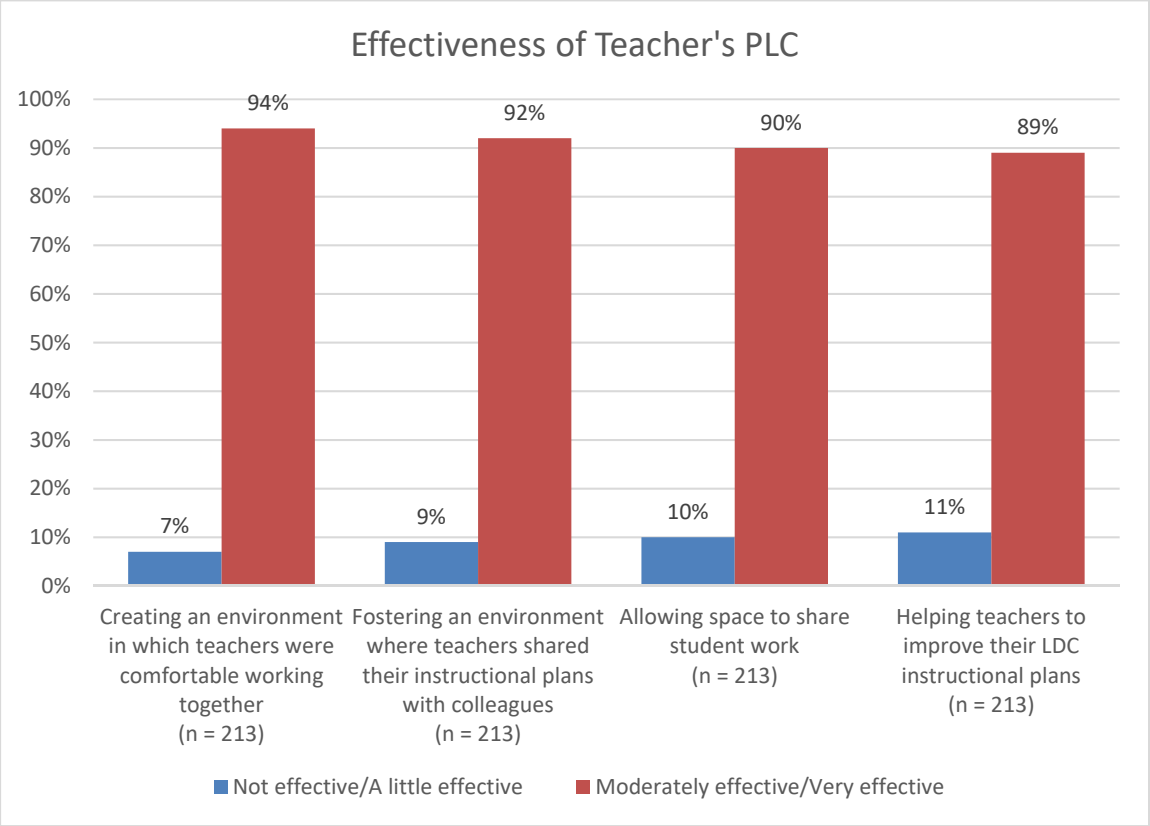

Figure 3.2. The effectiveness of teacher's PLC (T10).

The majority of teachers also reported satisfaction with different aspects of the online course materials by rating them *good* or *excellent*, including: relevance of information (84%); opportunity to extend learning (83%); clarity of information (81%); usefulness of resource documents such as the LDC Pitfall Checklist (78%); helpfulness in creating modules (78%); usefulness of videos (72%); and ease of use (70%) (see Table 3.2). Cohort 2 teachers were overall less positive about the online course materials with *good* or *excellent* ratings ranging from 63% to 82% depending on the item, compared to the Cohort 1 teachers whose ratings ranged between 77% and 95%.

Table 3.2

Rating Online Course Materials (n = 213)

	Poor	Fair	Good	Excellent
How would you rate each of the following aspects of the online course material (in the Learn tab in LDC CoreTools) that your coach used or directed you to use?				
Clarity of information presented	3%	16%	50%	31%
Relevance of information presented	1%	15%	55%	29%
Ease of use	8%	23%	47%	23%
Usefulness of resource documents (e.g., LDC Pitfall Checklist, CCSS Mental Markers, etc.)	3%	18%	48%	30%
Usefulness of videos	6%	22%	52%	21%
Degree to which course material helped me to create and/or adapt LDC modules	4%	19%	51%	27%
Opportunity to extend learning when needed or desired	4%	13%	52%	31%

Almost all teachers (99%) felt they were able to get the feedback and support they needed from their LDC coach and reported that coaches provided written feedback in a timely manner.

In addition to direct support during PLCs, at least half the teachers found the following types of asynchronous coach support found to be *moderately* or *very helpful*: written feedback in CoreTools (79%; 8% did not use); individual Zoom conference (77%; 11% did not use); and email or phone communication (77%; 13% did not use). In general, Cohort 1 returning teachers found the asynchronous coach supports more helpful than the other two teacher groups, especially with regard to written feedback: 91% of Cohort 1 returning teachers found it to be *moderately* or *very helpful*, compared to 76% of Cohort 2 teachers and 82% of Cohort 1 new teachers.

LDC implementation (T14-29). This domain covers questions on module creation (T14-17), module peer review (T27-29), and classroom implementation (T18-26).

Module Creation (T14-17) and Module Peer Review (T27-29). Teachers adapted or created two types of LDC instructional products: mini-tasks are short, generally taking one period, and focus on a specific skill; modules are longer, more complex units comprised of a series of mini-tasks, which build to a culminating "teaching task," an end of module writing assignment.

Using existing LDC templates and exemplars, teachers individually or collaboratively adapted between 0 and 10 modules during the year. Among the 184 teachers who answered this question, the majority of teachers (68%) adapted at least two modules, with 69 teachers

(38%) adapting two, 39 teachers (21%) adapting three, and 16 teachers (9%) adapting four or more modules. In contrast, 17 teachers (9%) adapted no modules and 43 teachers (23%) adapted one. The mean number of modules teachers adapted was 2.1.

Creating modules from scratch, teachers individually or collaboratively constructed from 0 to 20 modules (mean = 1.4). The majority (69 teachers or 38%) constructed one new module, while 53 teachers (29%) created zero new modules, 42 teachers (23%) created two, 13 teachers (7%) created three, and seven teachers (3%) reported creating four or more.

Teachers also reported how they constructed modules. A majority of teachers (62%) worked in teams of two or more to create modules. About half (48%) created modules individually, with secondary teachers (57%) doing this more frequently than elementary teachers (37%). A relative few (18%) collaborated with the entire PLC to write modules.

A little over a third of teachers (35%) reported attending a Peer Review/Curriculum Alignment Workshop during the 2017-2018 school year. Similarly, a little over a third of teachers (38%) submitted their modules for LDC National Peer Review, and this small percentage was to be expected given the preponderance of teachers were new to LDC this year. Of the 79 teachers who reported submitting modules for peer review, 29 (37%) found the process very helpful, 19 (24%) moderately helpful, 23 (29%) a little helpful, and eight (10%) not helpful. Cohort 1 new (67%), Cohort 2 (60%), and secondary (68%) teachers were more likely to report that the National Peer Review was helpful than Cohort 1 returning (50%) or elementary (53%) teachers.

Reflecting on the instructional strengths of their modules, most teachers felt confident in their ability to execute all nine of the instructional features of LDC modules that were tracked: teachers reported being able to select focus standards for the module culminating writing assignment (92% felt they were able to accomplish this to a *moderate* or *great extent*); create a standards-driven writing assignment (90%); identify the skills needed to complete the assignment (89%); create an assignment relevant and engaging to students (88%); select high quality texts (85%); plan multiple methods to assess progress (85%); assess the quality of writing assignments and instructional plans (82%); create daily skills lessons (79%); and differentiate instruction (76%). As the data in Table 3.3 show, teachers expressed the highest confidence in their ability to select focus standards and to create a standards-driven writing assignment.

Table 3.3

Rating on Teacher Skills Associated with Creating LDC Modules (n = 211)

	Not at all	A little bit	A moderate extent	A great extent
Please indicate to what extent you were able to do each of the following when creating LDC modules.				
Select focus standards for a writing assignment	1%	7%	36%	57%
Create a standards-driven writing assignment	1%	10%	36%	54%
Select high quality, complex texts and other materials that allowed students to engage in deeper learning	2%	13%	39%	46%
Identify the skills students need to develop to complete a writing assignment	1%	10%	42%	47%
Create daily lessons to teach the skills a student needs to complete a writing assignment	5%	16%	42%	37%
Differentiate instruction by incorporating multiple ways of thinking, various levels of complexity, and multiple modalities	6%	18%	42%	35%
Plan for a variety of methods to assess student progress (e.g., rubrics and/or mini-task scoring guides)	3%	13%	48%	36%
Assess the quality of writing assignments and/or instructional plans using Peer Review/Curriculum Alignment Rubric (e.g. Task Pitfalls Checklist, rubric indicators)	2%	16%	44%	38%
Make a writing assignment relevant and engaging for students	3%	10%	43%	45%

There were some differences by cohort in these ratings of LDC instructional features. Cohort 1 returning teachers felt more positive in their ability to execute LDC instructional features than the other two teacher groups. For example, Cohort 1 returning teachers appeared confident in their ability to select high quality texts (100%), create daily skills lessons (94%), or differentiate instruction (88%).

Classroom Implementation (T18-26). Toward the beginning of the year, teachers were asked to "Find and Teach" a module from the CoreTools library. The majority of teachers (62%) reported that they did "Find and Teach" a module from CoreTools, with more elementary teachers (72%) doing so than secondary teachers (53%). Of those teachers, 77% reported making adjustments to the modules they found to adapt them to their classroom needs.

After implementing the "Find and Teach" module, teachers were also asked to adapt, refine, and/or develop a module. The majority of teachers adapted and refined an existing module in the LDC Library in CoreTools (126 teachers, 60%) while the remainder (84 teachers, 40%) created a module from a template in CoreTools. A greater proportion of elementary teachers (72%) reported adapting an existing module compared than secondary teachers (50%). Most teachers (88%) reported teaching these modules by the time they completed this survey,

with nine teachers (4%) reporting that they planned to teach the module before the end of the 2017-2018 school year, 13 teachers (6%) planning to teach it during the next school year, and three teachers (1%) stating that they did not have any plans to teach the module.

After creating or adapting modules, teachers implemented them in their classrooms and reflected on their success. Teachers reported implementing from 0 to 20 modules (mean = 2.5), as well as from 0 to 50 mini-tasks (mean = 3.7) that were not part of modules (see Table 3.4 for more information). Most teachers (173 out of 211, or 82%) reported implementing at least the recommended two modules over the course of the school year. The majority of Cohort 1 returning teachers reported going beyond the recommended two modules and teaching three or more modules (69%).

Teachers reflected on various dimensions of their module implementation and the majority were positive about all aspects. Based on teacher reports, 88% were able to find evidence of student performance on targeted standards in student work to a moderate or great extent; 87% engaged students in understanding the assignment and the rubric for evaluating student work; 86% felt that they engaged students in accessing complex text; 84% felt they provided feedback to students using assignment rubrics; 83% used evidence of learning to modify instruction; and 81% systematically collected information about student learning. In addition, across all six dimensions, between 37% and 44% of the teachers reported that they were able to accomplish the activity "to a great extent," which indicated that about a third of more of the teachers felt very confident about their implementation.

Cohort 1 returning teachers were overall more positive than their peers about the above aspects of module implementation. In particular, Cohort 1 returning teachers engaged students in accessing complex text (98%), found evidence of student performance on targeted standards (98%), engaged students in understanding the rubric (97%), and provided feedback (97%). Elementary teachers reported (93%) engaging students in accessing complex text more than secondary teachers (72%).

Table 3.4

Number of Modules and Mini-Tasks Implemented (n = 211)

Numbers of Modules or Mini-tasks implemented in 2017-2018	N of Teachers Implementing Modules	N of Teachers Implementing Mini-Tasks
0	9	42
1	29	27
2	98	31
3	52	36
4	11	18
5	5	17
6	3	12
7	0	2
8	1	5
9	0	1
10	0	10
11	0	1
12	1	3
15	0	3
16	1	0
20	1	2
50	0	1

Leadership support (T33–37). This domain covers questions on teacher leader support and administrator support (T33-36) and teacher leadership role in LDC (T37).

Teacher Leader Support (T33). Teacher leaders were school staff who provided logistical support to the PLCs. Responses indicated that the vast majority of teachers were very satisfied with the level of teacher leader support. The teacher leaders were approachable (99% *agreed* or *strongly agreed*); effectively supported the PLC meetings (96%); effectively invited teachers to join LDC (96%); helped teachers align LDC to broader school goals (93%); and gave useful feedback (92%).

School Administrator Support (T34-36). School administrators were principals, assistant principals, or other instructional leaders who observed teachers in action and provided other leadership, such as protecting time for PLCs to meet. Teachers provided feedback about the support they received from their school administrator. The involvement of school administrators, as reported by teachers, was varied.

A little under half of teachers (44%) reported that their administrator attended less than one quarter of the LDC PLCs, and almost a quarter (22%) said their administrator attended about one quarter of the PLCs. Smaller proportions of teachers reported their administrator attended PLCs about half the time (14%), about three quarters of the time (5%), and more than three quarters of the time (15%). Cohort 1 returning teachers reported the least administrator participation compared to the other teacher groups.

Forty percent of teachers (40%) reported never being observed by an administrator while teaching an LDC mini-task, with a lower percentage of Cohort 1 returning teachers (28%) reporting no administrator observations compared to the other teacher groups (41-47%). About a third (32%) reported being observed once by their administrator; 18% were observed three or more times; and the remaining 11% were observed twice.

Almost all teachers (88%) agreed or strongly agreed that their administrator encouraged LDC participation. According to teachers, administrators were able to allocate resources to ensure PLCs had time to meet (81%); made formative assessment a priority (81%); had a firm understanding of LDC (80%); and communicated how LDC supported school initiatives and goals (79%). Most administrators also reportedly used LDC to implement standards-driven assignments within existing curriculum (71%) and provided feedback about LDC planning and instruction (62%). About half (48%) disagreed that administrators expressed concern that LDC was taking time away from other instructional priorities.

In general, Cohort 1 returning teachers were more likely to rate their administrators as supportive or effective than did the other two teacher groups. Cohort 1 returning teachers (91%) reported that their administrator allocated resources to ensure that the LDC team could meet, compared to their school peers newly joining LDC in 2017-2018 (74%). More Cohort 1 returning teachers (94%) reported that their administrators made formative assessment a priority than teachers in the other groups (both at 79%). More Cohort 1 returning teachers (88%) felt that their administrators used LDC to implement standards-driven assignments within the existing curriculum than Cohort 2 teachers (66%).

Teacher Leadership Role (T37). Many teachers who were not playing a formal teacher leader role as part of the LDC program nevertheless felt that LDC allowed them to exercise leadership in their schools. Most teachers *agreed* or *strongly agreed* that LDC gave them the opportunity to shape LDC implementation with the teacher leader and administrator (63%) and helped them set instructional goals for LDC work at their schools (61%). Two-thirds (66%) expressed interest in learning more about facilitating LDC implementation at their schools. Over half of teachers (55%) felt they were able to affect the direction of LDC at their site by having the opportunity to discuss expansion of LDC implementation at their school in future years.

Cohort 1 returning teachers were overwhelmingly more positive about their involvement in LDC decision making compared to the other two teacher groups. Eighty-four percent of Cohort 1 returning teachers *agreed* or *strongly agreed* that they were involved in setting

instructional goals for LDC in their schools compared to 64% of Cohort 1 new and 56% of Cohort 2 teachers. Similarly, 78% of Cohort 1 returning teachers reported having discussed how to expand LDC at their schools in future years and had the opportunity to work with their LDC teacher leaders and administrators to shape LDC implementation, compared to smaller proportions of Cohort 1 new teachers (50% and 58%, respectively) and Cohort 2 teachers (52% and 61%, respectively). Most Cohort 1 returning teachers (87%) reported that they were interested in learning more about how to lead LDC implementation at their schools (compared to 72% Cohort 1 new teachers and 60% Cohort 2 teachers).

LDC Impact (T30-32). This domain covers questions on LDC impact on teacher practice and learning (T30-31) and student learning (T32).

Impact on Teacher Practice and Learning (T30-31). We asked teachers about how LDC had changed their ability to practice key teacher skills. Specifically, we asked them to focus on the change from the beginning to the end of the current school year's work with LDC. We also asked them to provide additional information about the impact of LDC on their instructional practice.

Across all seven items asking about LDC-related pedagogical changes during the year, the majority of teachers rated themselves as having improved *moderately* or a *great deal*. Specifically, teachers perceived improvement in instructional planning by selecting focus standards (85%); creating standards-driven assignments (81%); identifying skills students needed to complete an assignment (81%); using evidence of student learning to modify instruction (80%); identifying patterns of student understandings and misconceptions (80%); creating daily lessons to teach the skills students needed (74%); and collecting information on students' progress (73%).

There were differences by cohort, with Cohort 2 teachers least likely to report positive change. Cohort 2 teachers ranged between 70% and 80% agreeing or strongly agreeing with statements on improving their skills, compared to 78-95% in the other two teacher groups. Seventy-six percent (76%) of Cohort 2 teachers *agreed* or *strongly agreed* that they improved on creating standards-driven writing assignments (compared to 94% of Cohort 1 returning teachers); 76% felt they identified skills students needed to complete an assignment (compared to 95% of Cohort 1 new teachers); and 74% thought that participating in LDC raised their expectations for students' writing (compared to 94% of Cohort 1 returning teachers).

Figure 3.3 reports data on other areas of LDC impact on teacher practice. The areas of widest reported LDC impact on teacher practice included helping teachers: collaborate with other teachers (84% *agreed* or *strongly agreed*); incorporate writing assignments into their classroom curriculum (82%); raise expectations for student writing (81%); develop relationships with teachers outside grade or subject (79%); incorporate state standards in classroom instruction (74%); and establishment of LDC modules as a part of existing instructional practice (71%). LDC had a slightly narrower but still apparent impact in the following areas: sharing LDC

work with colleagues outside of the LDC PLC (61%) and improving teacher evaluation ratings (60%).

Fewer Cohort 2 teachers agreed or strongly agreed with all of the above statements compared to the other two teacher groups. Cohort 2 teachers ranged from 51% to 81% on agreeing or strongly agreeing with those statements, compared to 74-100% of new and returning Cohort 1 teachers. Seventy-three percent of Cohort 2 teachers *agreed* or *strongly agreed* that participating in LDC raised my expectations for students' writing (compared to 97% of Cohort 1 new teachers); 62% of Cohort 2 felt using LDC modules became an important part of their teaching practice (compared to 90% of Cohort 1 new teachers); 69% of Cohort 2 felt that LDC helped them incorporate state standards in their instruction (compared to 84% of both Cohort 1 teachers); 76% of Cohort 2 said that LDC helped them incorporate writing assignments (compared to 95% of Cohort 1 new teachers); 51% of Cohort 2 agreed that LDC helped improve teacher evaluations (compared to 81% of Cohort 1 returning teachers); 72% of Cohort 2 said that participating in LDC helped developed working relationships with different teachers (compared to 100% of Cohort 1 returning teachers); and 54% of Cohort 2 teachers shared LDC work with other colleagues (compared to 75% of Cohort 1 returning teachers).

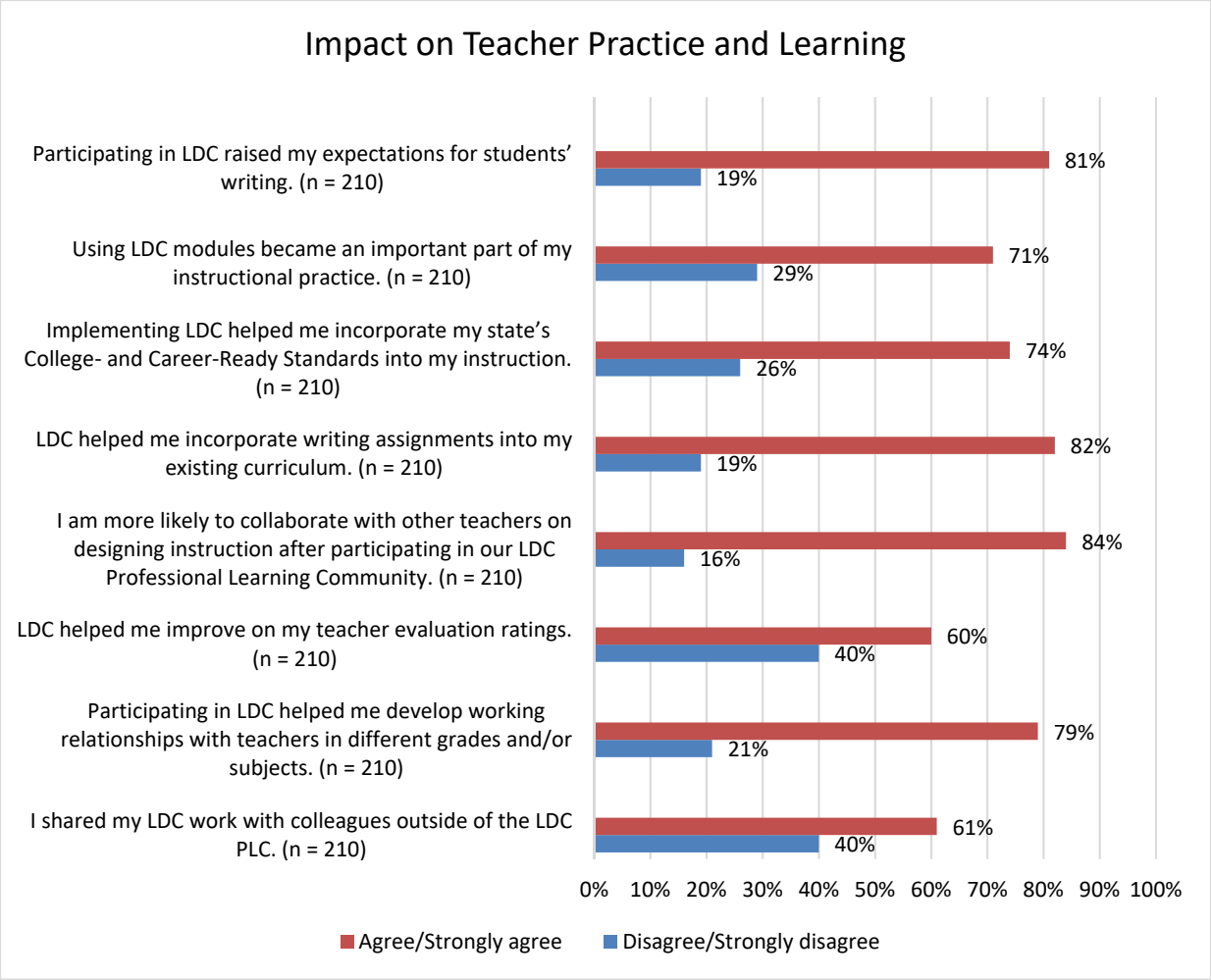

Figure 3.3. Impact on teacher practice and learning (T31).

Impact on Student Learning (T32).

Teachers were asked to evaluate the effect of LDC on student learning (see Table 3.5). On average, about three quarters of teachers agreed or strongly agreed that LDC impacted student learning in the following ways: increased content knowledge (79%); supported students to complete writing assignments (77%); increased student capacity to analyze components of the writing task (76%); improved quality of writing skills (75%); improved overall literacy performance (75%); increased performance on assessments throughout the year (74%); developed reading skills (73%); developed speaking and listening skills (68%); and developed skills needed for college and career readiness (67%).

Table 3.5

Impact on Student Learning (n = 210)

	Not at all	A little	Moderately	A great deal
Please indicate to what extent LDC had a positive effect on students in the following areas.				
Reading skills	9%	19%	52%	21%
Content knowledge	5%	16%	52%	27%
Ability to complete writing assignments	5%	18%	46%	31%
Quality of students' writing	6%	20%	48%	27%
College and career readiness	11%	22%	48%	19%
Capacity to analyze and understand the components of a writing assignment	6%	18%	48%	28%
Speaking and listening skills	11%	22%	51%	17%
Overall literacy performance	5%	21%	51%	24%
Performance on assessments throughout the school year	7%	19%	53%	21%

Cohort differences (15% or above) emerged for all but one of the statements on student learning, with Cohort 1 new teachers again appearing as the least positive and Cohort 1 returning teachers (those who had actually had two years of LDC experience) generally the highest. Cohort differences to note for the following effects on student learning (*moderately* to *a great deal*) include: reading skills (67% Cohort 2, 91% Cohort 1 returning); ability to complete writing assignments (70% Cohort 2, 97% Cohort 1 returning); quality of students' writing (70% Cohort 2, 94% Cohort 1 returning,); college and career ready skills (63% Cohort 2, 91% Cohort 1 returning); analyze and understand writing assignment components (71% Cohort 2; 97% Cohort 1 returning); speaking and listening skills (63% Cohort 2, 91% Cohort 1 returning); overall literacy performance (70% Cohort 2, 88% Cohort 1 returning); and performance on assessments throughout the year (68% Cohort 2, 94% Cohort 1 returning).

Facilitators and barriers (T38). Successful implementation of LDC depends on a number of factors. We asked teachers to weigh in on the effect of these factors on implementation (see Figure 3.4). Most teachers (83%) agreed or strongly agreed that it was easy to find and adapt LDC mini-tasks. Similarly, most teachers (83%) thought that their school had adequate technology to support teachers' use of LDC, although in open-ended responses, some teachers expressed concern about lack of technological knowledge which affected their access to CoreTools and the Zoom meetings. About three-fourths of teachers felt adequately prepared to

implement modules in the classroom (76%) and felt their PLC was given sufficient time to meet (74%), although many teachers cited time as a barrier in the open-ended responses. However, most teachers (60%) found it challenging to find content-rich texts to use with LDC modules.

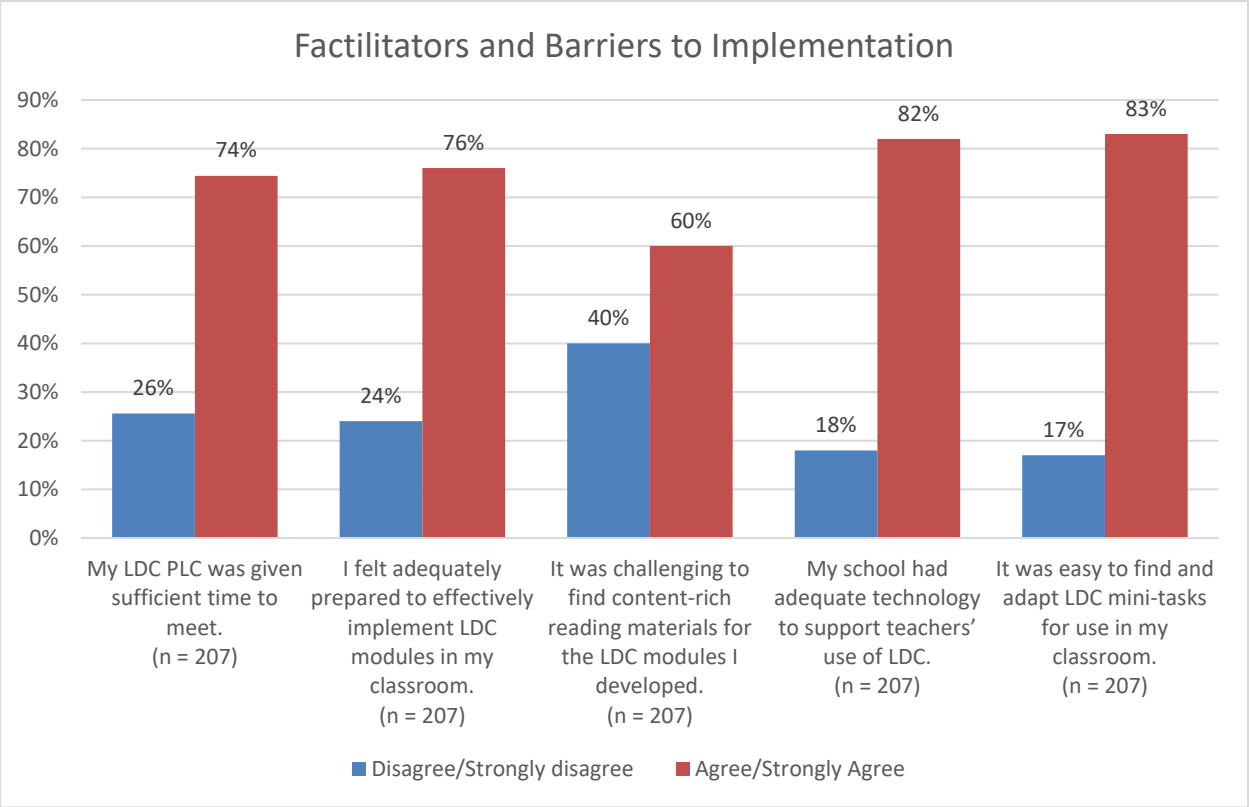

Figure 3.4. Facilitators and barriers to implementation (T38).

There were a couple differences by cohort in how teachers responded to facilitators and barriers in LDC implementation. While all Cohort 1 returning teachers (100%) agreed or strongly agreed that it was easy to find and adapt LDC mini-tasks, 78% of Cohort 2 and 84% of Cohort 1 new teachers felt the same way. Likewise, 94% of Cohort 1 returning teachers felt adequately prepared to effectively implement LDC modules in their classrooms, compared to 71% of Cohort 2 and 76% of Cohort 1 new teachers.

3.2 Teacher Leader Survey Results

This section presents the survey results from teacher leaders. At each school, the teacher leader coordinated PLC meetings with LDC coaches. Teacher leaders were either classroom teachers or coaches/coordinators. A total of 43 teacher leaders responded to the survey.

LDC Participation (TL1-2). The majority of the 43 teacher leaders who responded to the survey (26, 61%) reported that they were new to LDC and did not have experience with LDC prior to the 2017-2018 school year. Of the 17 teacher leaders (40%) who had prior experience

with LDC, they reported teaching between 0 and 5 (mean = 1.9) LDC modules and between 0 and 9 (mean = 2.0) LDC mini-tasks outside of the modules.

Professional Learning Community and Teacher Collaboration (TL3-6). Almost one half (44%) of teacher leaders reported that that their PLCs met once a week or more frequently. Forty-two percent of teacher leaders reported that their PLCs met every other week. A few teacher leaders (14%) reported that their PLCs met once a month, and no teacher leaders reported that PLCs met less than once a month. The 24 teacher leaders whose PLCs did not meet weekly reported that the primary barriers were that PLC members had other competing priorities (71%,), PLC time was not protected (25%), and PLC members had limited interest in attending meetings (21%).

Also similar to teacher responses, the majority of teacher leaders (56%) said these meetings lasted 45 to 59 minutes. Twenty-one percent (21%) reported that meetings lasted 60 to 74 minutes, and 19% reported that meetings were less than 45 minutes. A small minority (5%) said meetings lasted 75 minutes or more. Forty-four percent of teacher leaders reported having informal discussions about LDC once a week, 19% said every other week, 16% reported twice a week or more, 14% said once a month, and 7% reported less than once a month.

LDC Training and Support (TL7-12). Teacher leaders evaluated the effectiveness of the various training and support methods provided during LDC implementation. These included PLC meetings, online course material, and coach support. Their responses are slightly more positive compared to teacher ratings.

Teacher leaders reported that the PLC meetings were effective. Most teacher leaders (91%) felt that the LDC PLC was moderately to very effective in fostering an environment where teachers shared instructional plans with colleagues. Teacher leaders also reported that their PLC was effective in each of the following ways: allowing a space to share student work (86%); creating an environment in which teachers were comfortable working with each other (83%); and helping teachers learn to improve their LDC instructional plans (79%).

Online course materials used by the coaches during PLC meetings also received slightly higher ratings than overall teacher ratings. Most teacher leaders (84%) rated relevance of information and opportunity to extend learning when needed or desired as good or excellent; 81% for helpfulness in creating modules; 79% for usefulness of resource documents; 79% for usefulness of videos; 77% for ease of use; and 71% for clarity of information.

LDC coaches also were highly regarded by teacher leaders. All (100%) reported that they were able to get the feedback and support they needed from LDC coaches and that the coaches provided written feedback on modules in a timely manner. Different types of asynchronous coach support were rated by the majority of teacher leaders as moderately or very helpful. Teacher leaders generally found the support, when used, helpful. These supports were: email or phone communication (88% helpful; 5% did not use); individual video conferencing with coaches (88% helpful; 7% did not use); and written feedback in CoreTools (84% helpful; 5% did

not use). All teacher leaders (98%) reported that their LDC coaches connected them with additional resources when needed. Almost all teacher leaders (100%) agreed or strongly agreed that they were able to reach their coach with questions; 98% said that their coach responded quickly; 98% thought their coach was easy to work with; and 95% said the coach was knowledgeable and provided high quality guidance. Additionally, only 37% of teacher leaders reported that it was challenging to structure PLC time with the coaches.

Teacher leaders had the opportunity to attend LDC professional development meetings, both in person and online (these were in addition to PLC meetings). The average number of meetings attended was 4.0, with a range of 0 to 15. With respect to LDC support outside of coaches, all teacher leaders (100%) agreed that LDC offered sufficient professional development opportunities for them to lead the initiative at their schools, and 95% agreed that there was adequate technical support for CoreTools' issues.

Module Creation (TL13-16). Teacher leaders reported the ways in which modules were created in their PLCs and judged the extent to which they were able to embed targeted instructional practices while creating the modules.

Teacher leaders were asked how many existing LDC modules were adapted by their PLCs. Answers ranged from 0 to 15, with a mean of 3.2. Teacher leaders were also asked how many modules their PLCs created from scratch, either individually or as a group, and they reported 0-7 modules, with a mean of 2.0. Modules were most commonly created via a collaborative process, either by teams of two or more teachers (72%) or by the PLC as a whole (21%). Over half of the teacher leaders (51%) reported that modules were created by individual PLC members as well.

In general, teacher leaders were extremely confident in their ability to carry out targeted instructional practices while creating their modules; their responses were slightly more positive than those of general teacher participants. Almost all teacher leaders (93%) felt they were able, to a moderate or great extent, create a standards-driven writing assignment; 93% made writing assignments relevant and engaging to students; 93% identified the skills students needed to complete the writing assignment; 93% assessed quality of writing assignments or instructional plans; 91% selected focus standards for the writing assignment; 91% were able to select high quality texts and other materials; 86% created daily lessons to teach the necessary skills; 84% differentiated and provided multiple opportunities for students to engage with the assignment; and 84% planned for a variety of ways to assess student progress.

Impact on Student Learning (TL17). Teacher leaders were asked to evaluate the effect of LDC on student learning and here again their responses tend to be more positive than those of teacher participants. Teacher leaders *agreed* or *strongly agreed* that LDC impacted student learning in the following ways: improved quality of writing skills (86%); supported students to complete writing assignments (86%); increased performance on assessments throughout the year (84%); improved overall literacy performance (84%); increased student capacity to analyze

components of the writing task (81%); developed skills needed for college and career readiness (79%); developed reading skills (77%); increased content knowledge (77%); and developed speaking and listening skills (72%).

Alignment (TL21). Teacher leaders were asked how LDC aligned with other instructional priorities and programs at their schools. Alignment was generally perceived to be quite high as reported in Figure 3.5. Eighty-one percent *agreed* or *strongly agreed* that LDC helped teachers create writing assignments to use within their existing curricula. The majority of teacher leaders (91%) viewed LDC as complementing other initiatives at the school; 88% thought LDC was a strategy for implementing statewide college and career-ready standards; 84% said LDC helped prepare students for state assessments; and 77% reported their school connected LDC to specific school goals.

Notably, however, over three quarters (76%) believed that it was difficult for teachers to focus on LDC because of other competing priorities at the school, and 69% reported that time spent on LDC interfered with other initiatives.

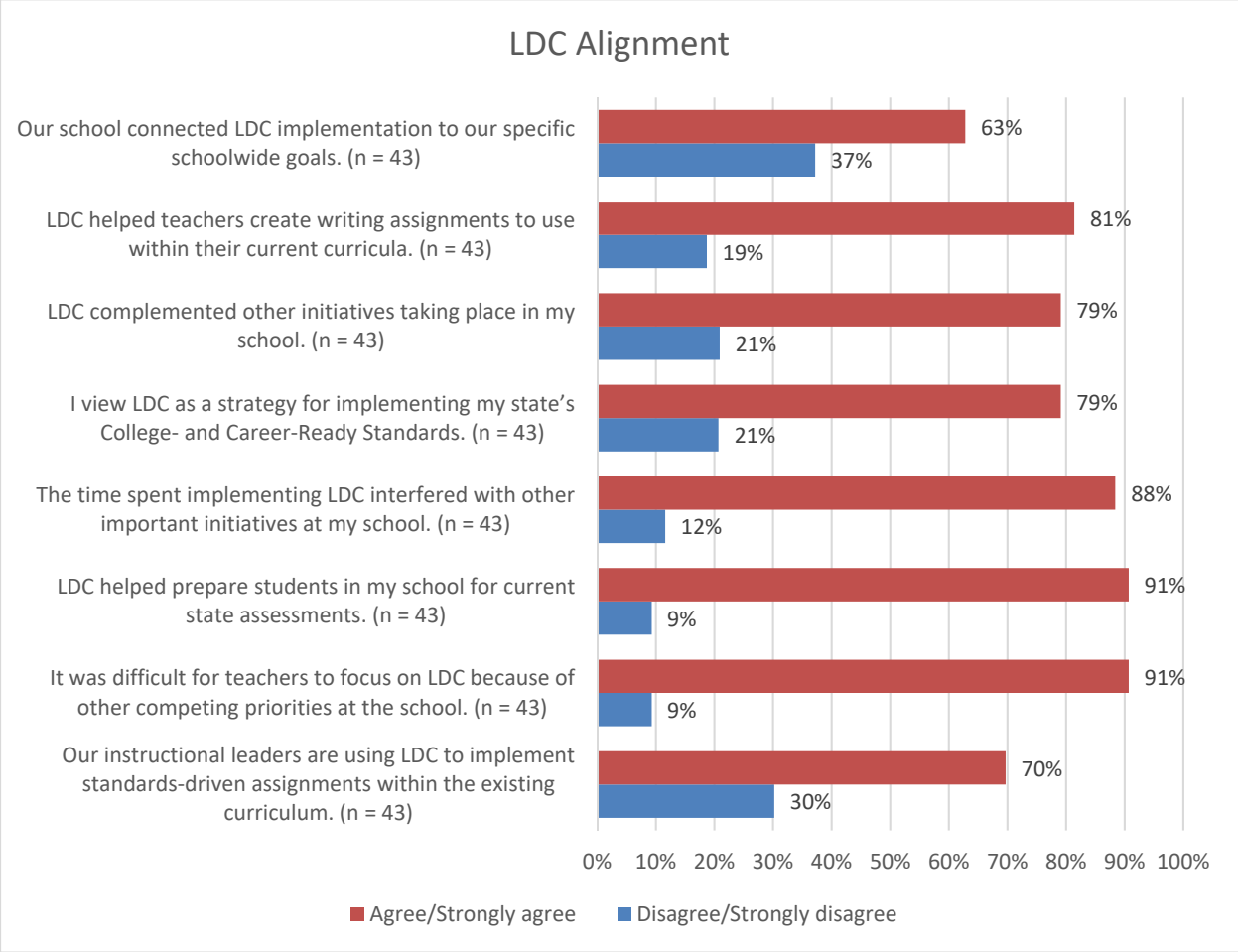

Figure 3.5. LDC alignment (TL21).

Teacher Leader Role (TL20). Teacher leaders reflected on their leadership role in LDC implementation at their school sites. Overall, results were very positive and indicated that the majority of teacher leaders felt engaged by and invested in LDC implementation at their school. Almost all (91%) agreed or strongly agreed that they met regularly with their LDC coach to manage the work plan; 91% felt they were able to build their own capacity as an instructional leader as a result of their LDC leadership role; 88% were involved in adjusting LDC problems of practice at their school; 81% were involved in planning how to meet teacher learning needs by differentiating LDC implementation; 79% were involved in discussions about how to expand LDC implementation in future years; 79% believed their role as LDC teacher leader helped them advocate for additional resources on their campus; 70% were confident that they could lead their PLC in the future without the assistance of an LDC coach; and 63% met regularly with their school administrator.

Leadership Support (TL18-19, T23). This domain covers questions on school administrator support (TL18-19) and district support (TL23).

School Administrator Support (TL18-19). Similar to teachers' responses, teacher leaders reported on school administrators' involvement with LDC. Forty-four percent of teacher leaders (44%) reported their administrators attended less than a quarter of PLC meetings; 21% about a quarter; 23% about half; and 12% more than three quarters.

A large majority of teacher leaders (93%) reported their administrators made formative assessment a priority at their school; 91% reported their administrators encouraged teachers to participate; 86% said their administrator communicated how LDC supported other school goals and initiatives; 81% said their administrators had a firm understanding of LDC; 81% reported that resources were allocated to ensure that the LDC team could meet; 81% said administrators used LDC to implement assignments with existing curriculum; and 68% said they received feedback about their LDC planning or instruction from their administrator. Notably, 58% of teacher leaders reported that their administrators expressed concern that LDC was taking time away from other instructional priorities, which is a higher percentage than that reported by teacher participants (48%).

District Support (TL23). Almost half of teacher leaders (49%) agreed or strongly agreed that district professional development efforts aligned with LDC; 47% said that district leaders supported implementation of LDC; 42% thought district leaders had a firm understanding of LDC; 40% reported that district leaders visited their school to discuss LDC implementation; and 35% agreed that district leaders were interested in implementing LDC at other schools.

Scale-up and Sustainability (TL22). Regarding the future of LDC implementation, most teacher leaders (84%) agreed or strongly agreed that they expected most teachers to continue with LDC the following year; 74% felt teachers and administrators were committed to sustaining the initiative; 70% expected their LDC PLC to increase in size the following year; and 70% reported that new collaborations were launched as a result of LDC (see Figure 3.6). Most

did not think that non-LDC teachers used LDC resources, such as the planning process or CoreTools, with only and 35% agreeing with this statement.

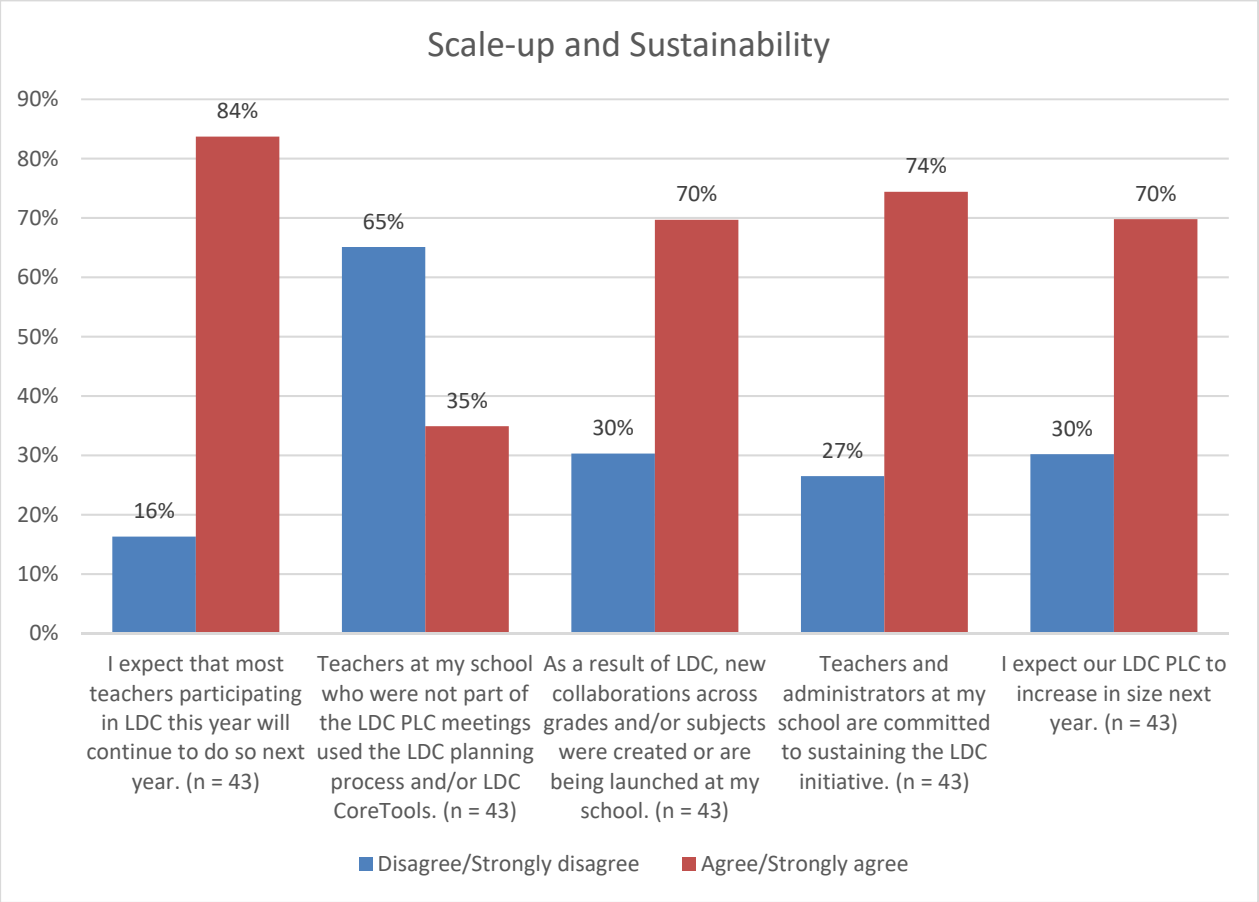

Figure 3.6. Scale-up and sustainability (TL22).

3.3 Administrator Survey Results

This section presents the survey results from school principals and assistant principals.

LDC Participation (A1) and Professional Learning Community (A2). Of the 17 school administrators who responded to this survey, 11 (65%) were principals and six (35%) were assistant principals. The majority of administrators (41%) reported attending less than one quarter of the LDC PLC meetings, 29% attended about one quarter, 12% attended about a half, and 12% attended about three quarters. One administrator (6%) reported attending more than three quarters. Administrator survey respondents overall reported somewhat similar levels of administrator attendance at PLC meetings as did teacher respondents.

Training and Support (A3-4). Administrators had the opportunity to attend professional development sessions, either online or in person, such as Launch Day and administrator

meetings. The reported range of meeting attendance was between 0 and 20, with an average of attendance of 6 meetings (mean = 5.6).

Perceptions of LDC were overwhelmingly positive. All administrations (100%) *agreed* or *strongly agreed* that LDC offered sufficient professional development for teacher leaders, LDC offered sufficient professional development opportunities for administrators, and LDC staff were able to connect them to additional resources. All administrators (94%, except for one who answered N/A to this statement) reported that they were able to reach LDC staff with questions. Also, all administrators except for one (94%) agreed that their school had adequate technology to access LDC.

Classroom Observation (A5-6). All administrators reported observing teachers implementing LDC at least once during the school year. Half (50%) of the administrators observed three or more times, 25% observed two times, and 25% observed one time. Most administrators who observed LDC instruction believed that LDC modules were *moderately* or *very effective* in developing students' literacy skills (88%). This rating was more positive than that from the teacher survey.

Impact on Teacher Practice (A7). A majority of administrators observed significant improvement in all areas of teacher practice probed on, with results similar to teachers' ratings. All administrators but one (94%) believed teachers had improved moderately or a great deal in selecting focus standards, identifying necessary skills to complete the writing assignment, creating standards-driven writing tasks, creating daily lessons to teach skills to complete the writing task, identifying patterns of student understandings or misconceptions, and collecting information on student progress in a systematic way. Most administrators (88%) also felt that LDC PLC members improved in using evidence of student performance to shape instructional decisions.

Impact on Student Learning (A8). Administrators also were positive, like teachers, about the effects of LDC on students. Large majorities of administrators agreed or strongly agreed that LDC helped students develop reading skills (93%); improved students' content knowledge (93%); helped students develop speaking and listening skills (93%); increased students' performance on assessments throughout the school year (93%); improved students' ability to complete writing assignments (87%); helped students understand components of the writing task (87%); improved students' writing quality (87%); supported students' college and career ready skills (87%); and helped students' overall literacy performance (87%).

Administrator Leadership Role (A9). Almost all administrators felt they played an active role in LDC implementation: 93% agreed or strongly agreed that they were able to shape LDC implementation at their schools; 93% met regularly with the LDC teacher leader; 93% were involved in discussions about differentiating LDC implementation to meet teacher needs; 93% made changes to school schedules to accommodate LDC PLC time; 93% allocated resources to

ensure LDC team could meet; and 87% led discussions about how to expand LDC implementation in future years.

Alignment (A10). Administrators reflected on how well LDC aligned with other school initiatives, programs, and curricula (see Figure 3.7). Here too, administrator responses were more positive than those of teachers and teacher leaders. All administrators (100%) agreed or strongly agreed that: their school connected LDC to specific schoolwide goals; LDC helped teachers create writing assignments to use within current curricula; it complemented other initiatives at the school; it was a strategy for implementing state college- and career-ready standards; it helped students prepare for state assessments; and they were using LDC to implement standards-driven assignments with existing curriculum. Almost all administrators (93%) said that LDC helped improve teacher evaluation ratings.

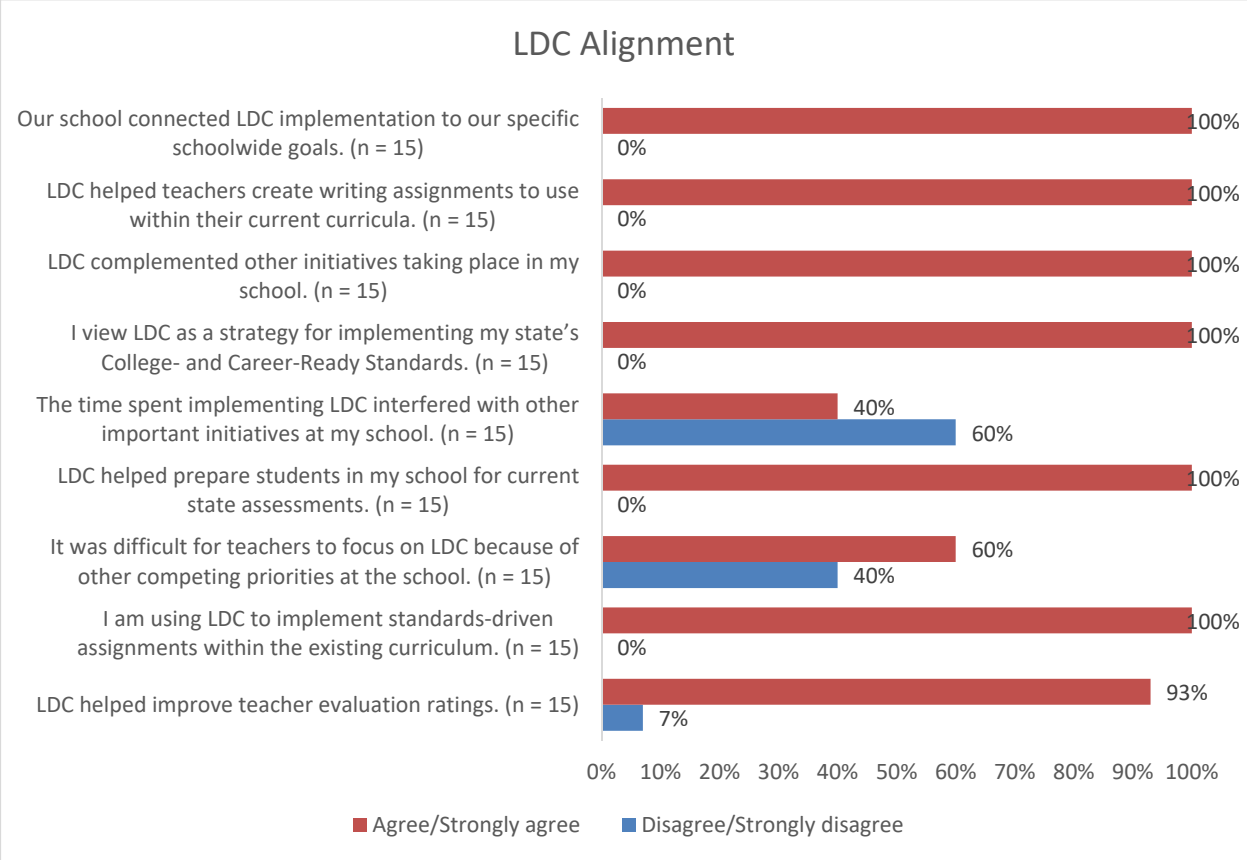

Figure 3.7. LDC alignment (A10).

Survey responses suggest that at least in some sites other initiatives being implemented simultaneously created a challenge, with 40% of administrators believing that the time spent on LDC interfered with other initiatives, and 60% reporting that it was difficult for teachers to focus on LDC because of other competing priorities.

Scale-Up and Sustainability (A11). The outlook for LDC implementation in future years was generally positive according to administrators, as reported in Figure 3.8. Administrators (87%) expected most teachers to continue LDC following year and *agreed* or *strongly agreed* that teachers and administrators were committed to sustaining LDC. A majority of administrators felt that there were new collaborations across grades and/or subjects as a result of LDC (67%) and expected the LDC PLC to increase in size in the next year (60%). However, few administrators (27%) felt that teachers who were not in the PLC were using the LDC planning process and tools.

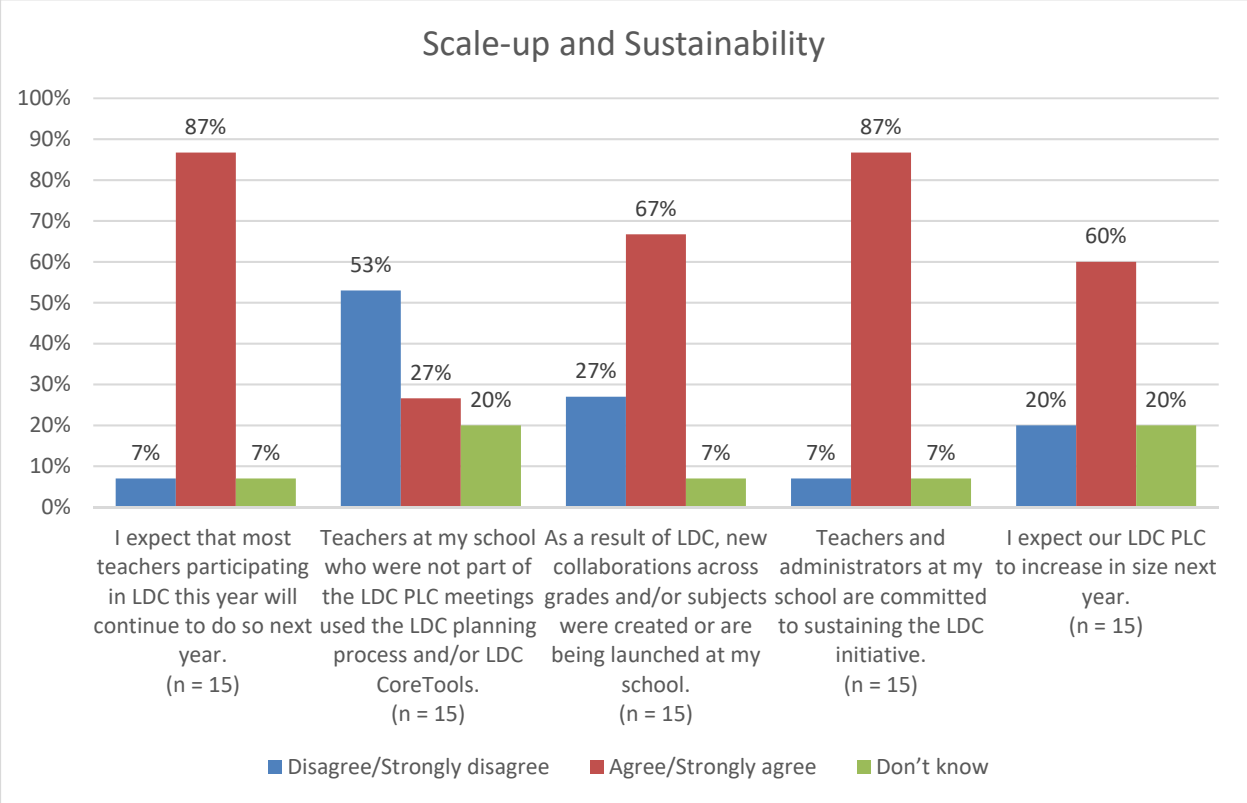

Figure 3.8. Scale-up and sustainability (A11).

District Support (A12). Administrator ratings of district support appear less positive than their ratings in other areas and suggest an area of need. A little over a third (36%) of administrators agreed or strongly agreed that district leaders supported the implementation of LDC; 29% reported that district leaders visited the school to discuss LDC implementation; 21% thought district leaders had a firm understanding of LDC; 21% thought district professional development efforts were aligned with LDC; and 14% agreed that district leaders were interested in expanding LDC to other schools.

3.4 Open-Ended Responses for All Participants

Each survey respondent was asked for feedback in response to three questions: (1) What supports did you find the most useful and why?; (2) What supports were not helpful and why?; and (3) In what ways could LDC implementation be improved in your school in the future?

Below are the summary findings across all three groups of respondents, including comments from 179 teachers, 42 teacher leaders (28 of whom were classroom teachers), and 12 administrators. In reviewing the results in this section, it is important to note that the majority of responses to all survey questions was positive. For example, when asked about supports that were not helpful, 62 (35%) of teachers, 16 (38%) of teacher leaders, and eight (67%) of administrators responded that everything was helpful.

Professional Learning Community and Program Implementation

LDC PLC meetings received 50 positive comments. Respondents especially appreciated the opportunity to collaborate with other teachers (14 comments) during the LDC PLC.

The most common suggestion for improving LDC implementation in the future was to provide time – either more time or protected time for the PLC. Time was mentioned at least 99 times, with related requests for meeting more frequently, more time and support to both plan and implement modules (not necessarily within the PLC time), more time for collaboration, and using time more efficiently. Teachers were generally positive about the content of the PLCs (e.g., use of assessment; focus on writing), but some were disappointed with the logistical issues (e.g., technology issues, difficulty scheduling meetings, pacing meetings and assignments appropriately) and alignment (e.g., standards, existing curriculum, content-area demands).

At least 27 respondents suggested an earlier start to LDC implementation or more teacher buy-in to get the implementation off the ground at their school. A handful of participants specifically requested summer training. A few participants requested half or full days of training, as opposed to an hour or two during the week, as well. There were 13 comments from the respondents who felt that increased teacher buy-in was necessary for LDC to succeed at their sites. Ideas for increasing teacher buy-in included teachers having fewer responsibilities so that they could focus on LDC implementation and more overall support. Related to this issue of teacher buy-in, a few teachers observed that PLC meetings would be more productive if teachers were prepared for meetings. Additionally, a few respondents suggested more site visits to schools implementing LDC.

Teacher leaders were viewed favorably with the respondents, with at least eight specific mentions of how well the school's teacher leaders supported teachers. For example, one teacher commented, "The most useful supports is meeting with my LDC leader at my school. Considering she is creating her own modules and readily available at my school to demonstrate what I need done, it has been the most helpful." However, there were a couple of negative mentions from teachers stating that their teacher leader needed more knowledge about LDC.

Regarding administrators, the 12 teachers and teacher leaders who mentioned them in the open-ended questions wanted more support from them. One teacher wrote that she wished for "a little more hands on approach by the administrators and for them to check in more of it." Another teacher asked to "ensure that the administrator understands the demands of having LDC as an initiative and what teachers need to be successful."

There were 32 suggestions about the breadth of teacher participation in LDC. Nineteen suggested including more teachers, and 10 suggested that the entire grade or content area department of teachers be included. Additional suggestions for participation included have a cross-curriculum or vertical grade level team or having only new teachers participate in LDC.

Coach (virtual)

LDC coaches were frequently mentioned, with 140 comments that virtual coaches were one of the most useful supports available and 20 comments that the virtual coaches were not helpful. These included comments about Zoom videoconference meetings with the entire PLC, individual Zoom meetings with coaches, email contact, and written feedback via CoreTools. As one teacher wrote, "virtual coaching has been most useful because it allowed our team to visually collaborate modules because our coach used split screens and we were given on the spot feedback and next steps."

Among the positive mentions, respondents praised coaches' feedback and guidance in navigating LDC website content like CoreTools as a whole, the library of modules, and the online courses. Respondents appreciated that they could ask questions and receive immediate feedback. For example, one teacher wrote, "I found that constant interactions with our coach was most effective and useful. She was willing to clarify any misconceptions that I had about creating performance based tasks." They appreciated one-on-one videoconferences with coaches and email, and especially appreciated written feedback via CoreTools (23 comments). One teacher wrote, "I found the core tools online platform, the virtual coaching especially useful because I was able to get instant feedback on what I implemented in the classroom as well as get suggestions on how to improve my teacher practice."

Respondents who felt virtual coaches were not helpful cited technical problems as the most common issue. Across all groups, there were 26 mentions of technology being a problem. When the videoconferencing software and hardware did not function properly, participants felt there was time wasted. Other negative comments included that the virtual coaches did not allow for personalized or differentiated support during the Zoom meetings. Notably, among suggestions for improvement, 21 comments were made about requesting more in-person coach visits, while only two respondents requested more video conferencing (with one respondent wanted more one-on-one video conferences), and one teacher leader requesting the same virtual coach for the following year.

Coach (in-person)

Here we report on comments about several types of in-person coaching, including virtual coaches' site visits, assistance from the district liaison and LDC liaison, and professional development trainings or workshops. There were 54 comments indicating that in-person coaching was one of the most useful supports, and six comments about in-person coaching not being helpful. The complaints against in-person coaching was mostly due to scheduling conflicts, as teachers mentioned that they were not available to meet with the coach when she came to campus. For those teachers who thought in-person coaching was the most useful support, they liked the immediate feedback. As mentioned earlier, there were 21 requests for more in-person coaching, with some suggesting having a coach observe classroom implementation of LDC modules, model implementation, and provide feedback and immediate debriefing after an observation.

LDC professional development trainings or workshops received 18 positive comments, seven requests for more workshops. There were 14 negative comments about the LDC professional development, in which few respondents thought there was too much information presented and that LDC should present clear goals for the program and implementation (e.g., scope and research). Ten teachers felt that LDC training and professional development should be more differentiated and flexible to allow for teachers with different levels of knowledge to benefit from LDC.

Whether in person or virtually, coaching was the most mentioned support in the open-ended responses. Respondents appreciated receiving feedback in any format, whether via individual Zoom conferences, during PLC conferences, via email, or the CoreTools platforms.

CoreTools

CoreTools received 103 positive comments, and 59 negative comments. Included in this count were comments about the content of the LDC library, most of which were positive. Participants who liked CoreTools mentioned the wealth of information on the site, including the rubrics and accessing mini-tasks and modules. Online courses, part of the CoreTools platform, received 12 positive mentions.

For those participants who struggled with CoreTools, the most commonly cited issues were navigation (22 comments), library modules not being user-friendly (8 comments), and limited content in the library modules (11 comments). Related to this idea of limited content were eight comments that the LDC modules in the library did not meet students' needs, either in terms of reading level, content (e.g., elementary grades, science), or participation in special programs (English learners and students with disabilities. The three most commonly cited barriers to mastering use of CoreTools were ease of use (i.e., navigation), lack of time to explore, and difficulty modifying existing modules. Related to the idea of ease of use, the most popular suggestion (9 comments) for improvements called for additional training in navigating CoreTools.

3.5 Summary of Results

These surveys captured the responses of 60% of all participants in the district's second year of implementation. In addition to answering closed-ended questions, most of the respondents also provided narrative comments about aspects of the program they felt were useful as well as those that could use improvement. Generally, respondents provided positive feedback. Overall, the survey results suggest the following.

Across all participant groups, survey responses showed positive attitudes toward LDC. All measures of satisfaction or improvement were rated positively by a majority of participants.

Three quarters of teachers, 84% of teacher leaders, and 87% of administrators agreed that LDC helped improve students' literacy performance. The three most highly rated areas of impact on students, according to all three groups, were students' ability to complete writing assignments, content knowledge, and quality of students' writing.

LDC coaches received almost unanimous positive feedback, with 98% of teachers and 100% of teacher leaders reporting that their coaches gave them appropriate and timely feedback and support.

Teacher leaders were almost universally reported to be highly approachable, effective, and knowledgeable.

Almost all teachers reported that their administrators encouraged LDC participation at the school, although only 62% of teachers reported receiving feedback from administrators about LDC and 40% reported never being observed while teaching an LDC task. Administrators' recollections about their classroom observations were more positive regarding their frequency. However, the response rate on the administrator survey was lower, and therefore responses are less generalizable to the total population.

Almost three fourths of teachers felt they had sufficient time to meet during professional learning community (PLC) sessions and 81% felt that their administrators allocated resources to ensure that they could meet. However, the most frequently requested modification for future years was for more time during and outside of PLCs to plan modules, implement, and receive feedback about implementation.

Almost one third of teachers and half of teacher leaders reported meeting in their PLCs once every two weeks, the frequency expected by LDC. However, 58% of teachers and 44% of teacher leaders reported meeting once a week or more. For teachers, the most cited barrier to meeting every week was that PLC members had other priorities that competed with LDC participation, and for teacher leaders, the most cited barrier was that PLC time was not protected.

Two thirds of teachers expressed interest in learning more about how to lead LDC implementation at their schools in the following year. The majority of teacher leaders (84%)

and almost half of administrators (47%) expected their teachers to continue with LDC the following year.

While 83% of teachers agreed that their school had adequate technology to support LDC implementation, open-ended responses indicated that successfully conducting Zoom meetings was a common complaint.

The majority of teachers (between 76% to 92%) reported success in nine key areas of LDC module development. Teachers were most confident in selecting focus standards, creating the writing assignment, identifying skills needed in the module, and making writing assignments relevant and engaging, and somewhat less confident in skills involving lesson planning and differentiation.

With regard to their classroom implementation of LDC modules, the majority of teachers reported success with all six key areas queried (between 81% to 88%). Teachers were most confident with engaging students in complex text, locating evidence of standards in final student work, and engaging students in understanding the assignment and rubric.

Most teachers found CoreTools to be helpful, but about a third of teachers reported that the website was not easy to use. The majority of teachers thought that online course materials were clear and relevant and provide an opportunity to extend learning when needed.

The majority of teachers reported improving in skills related to their own practice and learning in all seven skills listed (between 73% and 85%). Teachers were most likely to report impact in the following skills: selecting focus standards, creating standards-driven writing assignments, identifying skills students need in writing assignments, and identifying patterns of student understandings or misconceptions.

Over 80% of teachers agreed that participating in LDC raised their expectations for student's writing, helped them incorporate writing assignments into their existing curriculum, and made them more likely to collaborate with other teachers on designing instruction.

This year's survey responses were consistently positive across all dimensions and participant groups. Suggestions and recommendations provided in this report were primarily about adapting to and ameliorating district constraints, such as protected time for meetings and technological limitations.

4.0 Analyses of LDC CoreTools Data

In the following section, we report on how participants interacted with LDC's CoreTools online system. We begin by presenting participation rates for key CoreTools activities, including creating a user account, viewing modules, editing modules, and commenting on modules. Subsequently, we dig deeper into CoreTools viewing, editing, and commenting by sharing descriptive statistics for all i3 CoreTools users followed by results broken down by key subgroups (including participant role, cohort, school level, and content area taught). Then, we compare the level of engagement for i3 CoreTools users who completed and taught a full-length module to those users who did not complete and teach a module during the school year. Finally, we summarize results for the chapter.

4.1 CoreTools Activity Participation Rates

The four key CoreTools activities we examined are creating a user account, viewing modules, editing modules, and commenting on modules. Among the 373 CoreTools users, 315 were classroom teachers (with 34 of those individuals acting as teacher leaders), 19 were coaches or coordinators playing the teacher leader role, and 39 of them were administrators. As seen in Table 4.1, nearly all participants used CoreTools to at least some degree. Eighty-eight percent of all participants created a user account, 76% of participants viewed modules, and 62% edited modules. Commenting on modules was a less common activity with only 44% of all participants doing so.

Table 4.1

CoreTools Feature Participation Rates: 2017–2018

Participant type	Number of participants	Number and % of participants with user accounts	Number and % of participants who viewed a module	Number and % of participants who edited a module	Number and % of participants who commented on a module
Teachers	307	281 (92%)	266 (87%)	221 (72%)	155 (50%)
Teacher Leaders (classroom teachers)	38	34 (89%)	34 (89%)	32 (84%)	24 (63%)
Total teachers	345	315 (91%)	300 (87%)	253 (73%)	179 (52%)
Teacher Leader (coach/coordinator)[a]	20	19 (95%)	14 (70%)	11 (55%)	8 (40%)
Administrator (principals and assistant principals)	60	39 (65%)	10 (17%)	0 (0%)	2 (3%)
Total participants	425	373 (88%)	324 (76%)	264 (62%)	189 (44%)

In addition to displaying participation rates on key CoreTools activities for all participants, Table 4.1 also displays subgroup results for participants playing different roles in the LDC implementation. These subgroups mirror the four groups to whom we administered surveys: teachers, teacher leaders who teach in the classroom, teacher leaders who are coaches and coordinators, and administrators (principals and assistant principals). Teachers and teacher leaders had considerably higher participation rates than the principals and assistant principals, as expected. Classroom teachers playing the teacher leader role had substantially higher levels of engagement than coaches or coordinators playing the teacher leader role.

Nearly all participants created a CoreTools user account. Significantly, almost two thirds of administrators, who generally were not a part of the regular PLC meetings, created user accounts. This suggests that most administrators overseeing LDC PLCs had at least interacted with the online platform. With that said, less than one fifth of administrators viewed modules in the platform, while a large majority of PLC teachers and teacher leaders viewed modules in CoreTools.

We consider editing modules and mini-tasks to be the key indicator of deep engagement with the CoreTools module building platform. Our survey results indicated that nearly three quarters of participating teachers edited at least one module, compared to 55% of coaches and zero principals or assistant principals.

Overall, adding comments to modules was a much less common activity, with a little over half of classroom teachers having commented. Commenting was most common among teacher leaders, whose role was most conducive to giving feedback to PLC members. Only a couple principals or assistant principals utilized the commenting function.

4.2 Engagement with Key CoreTools Activities

In this section, we describe participants' level of engagement with three key CoreTools activities: viewing modules, editing modules, and commenting on modules. Descriptive statistics are reported for all participants with CoreTools user accounts, as well as a number of subgroups. Those subgroups capture the role the individual played in LDC (teacher, teacher leader, and administrator), the level of the school at which the participant worked (elementary, K–8, middle, 6–12, or high), the cohort of schools the participant belonged to, and in the case of teachers, the content area taught (elementary/multiple subjects, secondary ELA, secondary history/social studies, and secondary science). As noted earlier, some participants played multiple roles in the intervention, so the teacher and teacher leader groups overlap to some degree as they do in our survey analysis. There was also some overlap in sample across secondary content areas (for example, some teachers taught both ELA and social studies).

Descriptive statistics are only reported for groups with five or more members. The samples for the viewing, editing, and commenting analyses are the 373 LDC participants with CoreTools user accounts in 2017-2018 (see bottom row of Table 4.1).

Module viewing. In Table 4.2, we present descriptive statistics on how many times i3 participants viewed modules, both overall and by subgroup. We present the minimum number of views, the maximum number of views, the mean number of views, the standard deviation, and the sum of total views across all participants. Overall the average participant viewed modules or mini-tasks about 33 times, while the range was from zero views to 1,062 views. There were 49 participants with user accounts who did not view any modules (about 13 percent of the overall sample). The standard deviation of 82.2 suggests that about two thirds of all participants viewed modules between 0 and 115 times (with the remaining third viewing a greater number of times).

Table 4.2

Descriptive Statistics for the Number of Times a Participant Viewed a Module in CoreTools, by Participant Subgroup

Subgroup	*n*	Min	Max	*M*	*SD*	Sum
All participants	**373**	**0**	**1,062**	**32.8**	**82.2**	**12,244**
Participant role						
All teachers	315	0	1,062	37.0	88.3	11,658
All teacher leaders	53	0	216	40.6	43.3	2,149
All administrators	39	0	50	2.2	8.2	86
Cohort						
Cohort 1 Returning Teachers	70	0	1,062	55.8	149.7	3,904
Cohort 1 New Teachers	65	0	699	45.3	108.2	2,946
Cohort 2 Teachers	238	0	146	22.7	24.9	5,394
School level						
Elementary school level participants	140	0	130	25.8	27.3	3,610
K–8 school level participants	45	0	142	31.9	37.1	1,435
Middle school level participants	140	0	146	18.8	22.1	2,626
6–12 school level participants	40	0	1,062	111.7	226.1	4,467
High school level participants	8	0	34	13.3	11.2	106
Content area taught						
Taught elementary/multiple subjects	120	0	130	26.0	25.0	3,114
Taught secondary ELA	30	1	1,062	146.1	252.0	4,383
Taught secondary social studies/history	17	0	315	32.4	73.4	550
Taught secondary science	8	0	28	14.1	8.5	113

As would be expected, teacher leaders on average had the greatest number of views among the three participant roles, while administrators viewed by far the least number of times. There was considerable variation in viewing behavior across participant subgroups within these categories. Cohort 1 teachers viewed modules at higher levels than Cohort 2 teachers. Participants in 6-12 schools viewed considerably more modules on average than their peers in schools with other grade ranges. Secondary ELA teachers had by far the highest level of engagement in terms of module viewing, followed by secondary social studies/history teachers, elementary teachers, and finally secondary science teachers.

Module editing. On average, participants with CoreTools user accounts made almost 16 edits to modules over the course of the school year. There was a wide range of engagement from editing zero times to making 309 edits to modules. One-hundred nine participants with CoreTools user accounts (29%) did not do any editing of modules. Two thirds of participants edited between zero and 46 times. Table 4.3 reports the descriptive results.

As with page viewing results, teacher leaders edited more than teachers not playing a leadership role. No administrators edited any modules. Cohort 1 teachers edited modules at considerably higher levels on average than Cohort 2 teachers. As with module viewing, teachers at 6-12 schools and secondary ELA teachers edited at higher levels than their peers.

Table 4.3

Descriptive Statistics for the Number of Times a Participant Edited a Module in CoreTools, by Participant Subgroup

Subgroup	*n*	Min	Max	*M*	*SD*	Sum
All participants	**373**	**0**	**309**	**15.8**	**30.6**	**5,884**
Participant role						
All teachers	315	0	309	17.9	32.5	5,648
All teacher leaders	53	0	110	27.1	25.8	1,436
All administrators	39	0	0	0.0	0.0	0
Cohort						
Cohort 1 Returning Teachers	70	0	278	24.8	47.1	1,733
Cohort 1 New Teachers	65	0	309	21.5	45.2	1,398
Cohort 2 Teachers	238	0	91	11.6	14.9	2,753
School level						
Elementary school level participants	140	0	70	11.2	14.8	1,570
K–8 school level participants	45	0	83	13.9	19.1	627
Middle school level participants	140	0	91	12.0	17.7	1,673
6–12 school level participants	40	0	309	48.8	73.1	1,952
High school level participants	8	0	21	7.8	6.8	62
Content area taught						
Taught elementary/multiple subjects	120	0	70	9.9	12.8	1,190
Taught secondary ELA	30	1	309	53.3	82.1	1,600
Taught secondary social studies/history	17	0	162	21.4	38.0	364
Taught secondary science	8	0	24	10.8	8.9	86

Module commenting. Half of participants with user accounts made at least one comment on a module. Participants commented between one and 66 times, and on average about three times. Across participant roles, teacher leaders had the highest level of engagement in commenting (about four comments on average). As with viewing and editing, Cohort 1 participants and secondary ELA teachers showed a higher level of engagement than their peers.

Table 4.4

Descriptive Statistics for the Number of Times a Participant Commented on a Module in CoreTools, by Participant Subgroup

Subgroup	*n*	Min	Max	*M*	*SD*	Sum
All participants	**373**	**0**	**66**	**2.9**	**6.0**	**1,065**
Participant role						
All teachers	315	0	66	3.2	6.4	1,018
All teacher leaders	53	0	29	4.1	5.9	215
All administrators	39	0	9	0.3	1.5	11
Cohort						
Cohort 1 Returning Teachers	70	0	66	5.3	11.5	373
Cohort 1 New Teachers	65	0	23	2.6	4.2	169
Cohort 2 Teachers	238	0	20	2.2	3.4	523
School level						
Elementary school level participants	140	0	66	3.6	7.7	508
K–8 school level participants	45	0	27	2.5	4.8	144
Middle school level participants	140	0	23	1.8	3.6	253
6–12 school level participants	40	0	29	4.1	7.1	163
High school level participants	8	0	12	3.4	4.1	27
Content area taught						
Taught elementary/multiple subjects	120	0	66	3.5	8.0	425
Taught secondary ELA	30	0	27	6.0	7.5	180
Taught secondary social studies/history	17	0	7	1.2	1.9	21
Taught secondary science	8	0	8	1.8	2.7	14

4.3 CoreTools Engagement as an Implementation Variable

To evaluate the validity of CoreTools engagement as an indicator of LDC implementation, we examined the relationship between the three CoreTools engagement measures and module implementation. As described in Chapter 6, we use the presence of uploaded student work as evidence of teachers having taught the module in their classrooms. Figure 4.1 displays the mean number of CoreTools views, edits, and comments for the 134 participants who completed and taught LDC modules (as indicated by the upload of student work samples) and their 211 peers for whom we do not have evidence of module implementation. As shown, teachers who

completed and taught LDC modules exhibited considerably more engagement with CoreTools than their peers, across all three metrics. The results suggest that participants who engage deeply with the module building platform are more likely to complete and teach LDC modules.

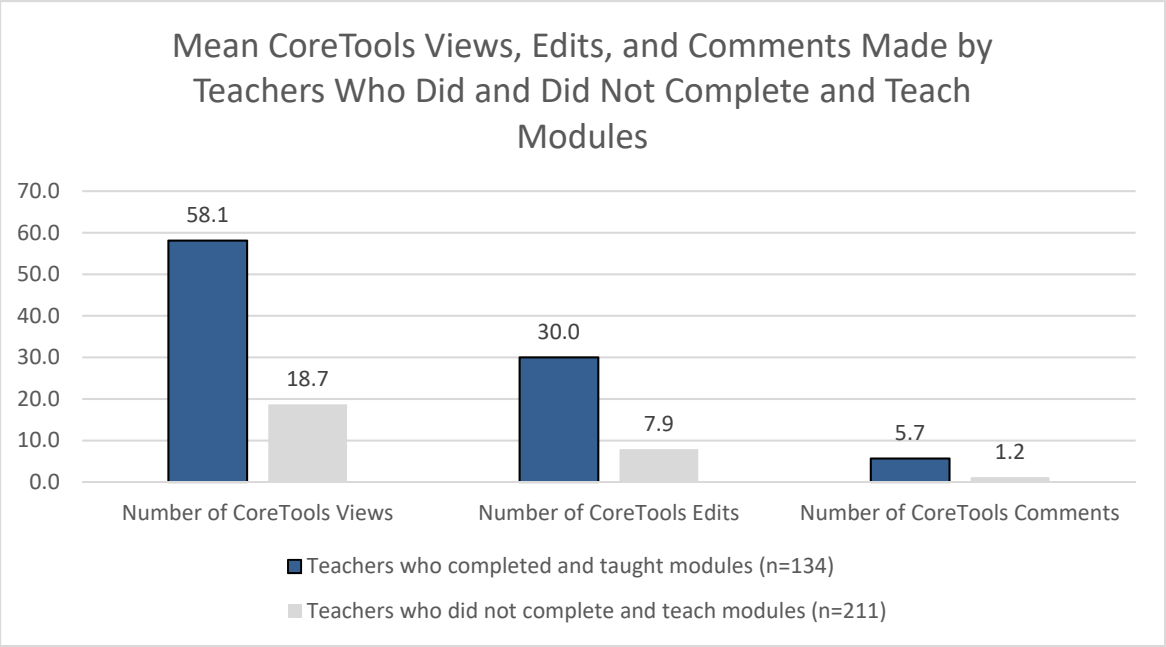

Figure 4.1. Mean number of CoreTools views, edits, and comments made by teachers who did and did not complete and teach modules.

4.4 Summary of Results

Descriptive analysis of CoreTools user behavior shows broad engagement with LDC's module building platform but the depth of that engagement varied greatly across users. Nearly all 2017-2018 LDC participants, including principals, created a CoreTools user account, and the vast majority of teachers in PLCs viewed and edited modules. The average teacher, however, only made 16 edits to modules. While this might be interpreted as evidence that teachers' engagement in instructional design was somewhat limited, the CoreTools data does not provide any measures of instructional design work conducted offline by individuals or groups of teachers. Furthermore, this descriptive analysis provides a broad rather than deep look, and does not take into account LDC expectations that teachers will do very little design work on their first module and extensive instructional design on their later modules.

Teacher leaders on average engaged at higher levels than their peers not playing a leadership role in the LDC intervention. Cohort 1 returning and new teachers tended to engage at higher levels than Cohort 2 teachers. Secondary ELA teachers also engaged at substantially higher levels than secondary social studies and science teachers and elementary teachers.

5.0 Module Artifact Analysis

This section presents results for the analysis of modules submitted during the 2017–2018 school year. We first present overall results across the grade bands. This is followed by separate results for the elementary and secondary modules. Finally, we present results of an exploratory analysis examining results across time for Cohort 1 teachers who submitted modules across the last two school years, the qualitative results, and a summary of the findings. Appendix F has the Generalizability Theory results.

Table 5.1 shows the overall means and standard deviations by grade band for the module artifact analysis. When examining the ratings, the elementary modules generally received higher mean ratings than did the secondary modules. More specifically, mean ratings for the elementary modules ranged from 3.25 to 3.95, indicating that on average all dimensions were moderately present or realized. In contrast, mean ratings for the secondary modules were in the low to mid threes (3.22 to 3.49). The highest mean for each grade band was for Dimension 1, which measures the effectiveness of the writing task.

Furthermore, as one would hope to find, the average summary scores for the first five dimensions were similar to the overall impression ratings (Dimension 6) provided by the expert teachers. Similar results were found when examining the frequencies, with between 42% and 69% of elementary modules and between 38% and 50% of secondary modules receiving ratings of four or greater out of a possible five on the six dimensions. Greater detail about the frequencies can be found in Appendix F.

Table 5.1

Means and Standard Deviations for the Modules

Dimension	Elementary	Secondary	Overall
Dimensions	*n* = 65	*n* = 76	*n* = 141
1. Effective writing task	3.95 (1.19)	3.49 (1.14)	3.70 (1.18)
2. Standards alignment	3.81 (1.10)	3.29 (0.98)	3.53 (1.06)
3. Fidelity to LDC instruction	3.55 (1.26)	3.38 (1.26)	3.46 (1.26)
4. Quality instructional strategies	3.25 (1.13)	3.32 (1.28)	3.28 (1.21)
5. Coherence/clarity of module	3.29 (1.06)	3.22 (1.18)	3.26 (0.95)
6. Overall impression	3.48 (0.94)	3.32 (0.97)	3.39 (0.95)
Average (Dimensions 1 to 5)	3.57 (0.92)	3.34 (0.80)	3.45 (0.86)

5.1 Analysis of Elementary Modules

The following section presents descriptive results for the elementary modules disaggregated by content area and then by cohort. Results from the generalizability theory modules as well as expanded descriptive results for the elementary modules can be found in Appendix F.

Descriptive results by content area. Table 5.2 presents descriptive results for the elementary modules by content area. A few comparative observations can be made. First, when looking across the content areas, modules generally received higher ratings on the effective writing task (Dimension 1) than most other dimensions. Second, the dimensions where modules received somewhat lower means varied depending upon the content area. The lowest mean for ELA involved Dimension 3, the lowest for science involved Dimension 5, and the lowest for social studies involved Dimension 4. Third, the average summary scores for the first five dimensions were similar to the overall impression ratings (Dimension 6) provided by the expert teachers. Finally, the social studies modules had the largest means on each dimension and also had the highest proportion of ratings of four or greater out of a possible five when compared to the other content area results.

Table 5.2

Means and Standard Deviations for the Elementary Modules by Content Area

Dimension	ELA	Science	Social Studies
Dimensions	*n* = 34	*n* = 9	*n* = 22
1. Effective writing task	3.76 (1.21)	3.67 (1.41)	4.36 (1.00)
2. Standards alignment	3.99 (0.66)	2.44 (1.51)	4.09 (1.11)
3. Fidelity to LDC instruction	3.15 (1.23)	3.67 (1.22)	4.14 (1.13)
4. Quality instructional strategies	3.24 (0.92)	2.78 (1.20)	3.45 (1.37)
5. Coherence/clarity of module	3.32 (0.88)	2.33 (0.87)	3.64 (1.18)
6. Overall impression	3.38 (0.85)	2.89 (0.93)	3.86 (0.94)
Average (Dimensions 1 to 5)	3.49 (0.79)	2.98 (1.06)	3.94 (0.92)

Descriptive results by cohort. Table 5.3 presents descriptive results for the elementary modules by cohort: Cohort 1 returning teachers, Cohort 1 new teachers, and Cohort 2 teachers. Because of the large differences in sample sizes, we focus our discussion on some general trends. First, mean ratings were generally highest for the first two dimensions, which focused on the effective writing task and standards alignment. Second, teachers tended to struggle the most regarding Dimensions 4 and 5, which rate the quality of instructional strategies and the coherence and clarity of the module. Third, in comparing the Dimension 6 ratings to the

average for the first five dimensions, it is apparent that expert teachers' overall impressions were fairly aligned for each of the cohort subgroups. Finally, the proportion of ratings of four or greater for each cohort subgroup were the greatest for Dimension 1 (70% to 100%). Furthermore, less than half of the Cohort 1 Returning and Cohort 2 modules received ratings of four or greater for Dimensions 4 and 5.

Table 5.3

Means and Standard Deviations for the Elementary Modules by Cohort Grouping

Dimension	Cohort 1 Returning	Cohort 1 New	Cohort 2
Dimensions	*n* = 10	*n* = 1	*n* = 54
1. Effective writing task	4.10 (0.99)	--	3.91 (1.23)
2. Standards alignment	4.10 (0.74)	--	3.73 (1.15)
3. Fidelity to LDC instruction	3.80 (0.92)	--	3.48 (1.31)
4. Quality instructional strategies	3.00 (1.05)	--	3.26 (1.14)
5. Coherence/clarity of module	3.10 (0.99)	--	3.30 (1.06)
6. Overall impression	3.50 (0.85)	--	3.44 (0.94)
Average (Dimensions 1 to 5)	3.62 (0.68)	--	3.54 (0.95)

5.2 Analysis of Secondary Modules

The following section presents descriptive results for the secondary modules disaggregated by content area and then by cohort. Results from the generalizability theory modules as well as the expanded descriptive results for the secondary modules can be found in Appendix F.

Descriptive results by content area. Table 5.4 presents descriptive results for the secondary modules by content area. While the subgroups vary greatly in size, some general observations can still be made. For example, there was very little variation in the ratings for ELA, with means ranging from 3.09 to 3.20. In contrast, there were moderate amounts of variation in mean ratings for social studies (3.61 to 3.91) and large amounts of variation for science (2.56 to 4.00). In addition, means tended to be higher for the effective writing task (Dimension 1) and lower for coherence and clarity of the module (Dimension 5). Furthermore, as one would hope to find, the average summary scores for the first five dimensions were similar to the overall impression ratings (Dimension 6) provided by the expert teachers. Finally, when looking at the proportion of ratings of four or greater out of a possible five, percentages were generally less than 50% for ELA and science and were greater than 50% for each of the social studies dimensions.

Table 5.4

Means and Standard Deviations for Secondary Modules by Content Area

Dimension	ELA	Science	Social Studies
Dimensions	*n* = 44	*n* = 9	*n* = 23
1. Effective writing task	3.16 (1.03)	4.00 (1.00)	3.91 (1.20)
2. Standards alignment	3.18 (0.97)	2.56 (1.01)	3.78 (0.74)
3. Fidelity to LDC instruction	3.18 (1.32)	3.22 (1.30)	3.83 (1.07)
4. Quality instructional strategies	3.20 (1.11)	3.11 (1.36)	3.61 (1.53)
5. Coherence/clarity of module	3.09 (1.05)	2.89 (0.93)	3.61 (1.44)
6. Overall impression	3.09 (0.83)	3.00 (1.00)	3.87 (1.01)
Average (Dimensions 1 to 5)	3.16 (0.67)	3.16 (0.79)	3.75 (0.91)

Descriptive results by cohort. Table 5.5 presents descriptive results for the secondary modules by cohort: Cohort 1 Returning, Cohort 1 New, and Cohort 2. In this case, mean ratings generally in the low to mid threes for each of the dimensions across the three cohort subgroups. The exceptions involve standards alignment (Dimension 2) for the Cohort 1 Returning modules, and quality instructional strategies (Dimension 4) and coherence and clarity of the module (Dimension 5) for the new Cohort 1 teachers. Furthermore, as with the content area results, the average summary scores for the first five dimensions were similar to the overall impression ratings provided by the expert teachers. Finally, only a small to moderate proportion of the modules received ratings that were four or greater for the different dimensions for the Cohort 1 returning teachers (23% to 55%), Cohort 1 new teachers (24% to 52%), and Cohort 2 teachers (42% to 55%).

Table 5.5

Means and Standard Deviations for the Secondary Modules by Cohort Grouping

Dimension	Cohort 1 Returning	Cohort 1 New	Cohort 2
Dimensions	*n* = 22	*n* = 21	*n* = 33
1. Effective writing task	3.41 (1.26)	3.33 (1.11)	3.65 (1.08)
2. Standards alignment	2.96 (1.04)	3.43 (1.08)	3.42 (0.83)
3. Fidelity to LDC instruction	3.46 (1.26)	3.19 (1.47)	3.46 (1.15)
4. Quality instructional strategies	3.46 (0.96)	2.90 (1.61)	3.48 (1.20)
5. Coherence/clarity of module	3.46 (0.86)	2.67 (1.39)	3.42 (1.15)
6. Overall impression	3.41 (0.73)	3.05 (1.24)	3.42 (0.90)
Average (Dimensions 1 to 5)	3.34 (0.65)	3.10 (1.04)	3.48 (0.70)

5.3 Exploratory Analysis of Modules

As previously noted, in order to examine potential growth among the Cohort 1 teachers who continued with LDC in 2017-2018 (returning teachers), ratings were compared for teachers who submitted complete modules in both the 2016—2017 and 2017—2018 school years. The following presents descriptive results for the last complete module submitted by these teachers. Additional descriptive results for the exploratory analyses can be found in Appendix F.

Table 5.6 presents results for the five elementary teachers and 14 secondary teachers who submitted complete modules during both school years. While the sample sizes are too small to be significant, a few observations can be made. First, mean ratings were generally greater for the modules submitted during the 2017—2018 school year than they were for the 2016—2017 school year. Among the elementary modules, the exceptions involved Dimensions 4 and 5, which measure quality instructional strategies and coherence and clarity of the module. In contrast, the only dimension where the means for the secondary modules went down involved standards alignment (Dimension 2). When comparing the average summary scores for the first five dimensions with Dimension 6, means were somewhat closer in alignment at the first time-point than at the second time-point.

Table 5.6

Means and Standard Deviations for the Exploratory Analysis of Modules

Dimension	2016–2017	2017–2018	Change
ELEMENTARY (n = 5)			
1. Effective writing task	4.00 (1.73)	4.20 (0.84)	0.20
2. Standards alignment	3.40 (1.52)	4.00 (0.71)	0.60
3. Fidelity to LDC instruction	2.60 (1.14)	4.00 (0.71)	1.40
4. Quality instructional strategies	3.40 (1.34)	2.80 (1.10)	-0.60
5. Coherence/clarity of module	3.20 (1.92)	3.00 (1.22)	-0.20
6. Overall impression	3.20 (1.48)	3.40 (0.89)	0.20
Average (Dimensions 1 to 5)	3.32 (0.87)	3.60 (0.71)	0.28
SECONDARY (n = 14)			
1. Effective writing task	3.29 (1.20)	3.57 (1.22)	0.29
2. Standards alignment	3.14 (1.17)	2.93 (1.14)	-0.21
3. Fidelity to LDC instruction	3.14 (1.29)	3.29 (1.59)	0.14
4. Quality instructional strategies	3.00 (1.24)	3.93 (0.62)	0.93
5. Coherence/clarity of module	2.93 (1.38)	3.79 (0.80)	0.86
6. Overall impression	3.07 (1.14)	3.64 (0.84)	0.57
Average (Dimensions 1 to 5)	3.10 (0.99)	3.50 (0.81)	0.40
OVERALL (n = 19)			
1. Effective writing task	3.47 (1.35)	3.74 (1.15)	0.26
2. Standards alignment	3.21 (1.23)	3.21 (1.13)	0.00
3. Fidelity to LDC instruction	3.00 (1.25)	3.47 (1.43)	0.47
4. Quality instructional strategies	3.11 (1.24)	3.63 (0.90)	0.53
5. Coherence/clarity of module	3.00 (1.49)	3.58 (0.96)	0.58
6. Overall impression	3.11 (1.20)	3.58 (0.84)	0.47
Average (Dimensions 1 to 5)	3.16 (0.94)	3.53 (0.77)	0.37

5.4 Qualitative Results

Expert raters also participated in debriefings to shed light on their ratings and suggest potential ways to improve ratings in the future. These debriefings were conducted at the end of each week of ratings. The following presents key findings concerning Dimensions 1 through 5, as well as our expert raters' overall impressions.

Dimension 1: effective writing task. While a majority or the modules received higher ratings of four or five on this dimension, the writing task was not always realized. Modules that received lower ratings for this category tended to have a writing task that was either overly generic or too verbose for the expert rater to understand how it would be taught. In addition, the student background section was not used in a consistent manner, with some teachers using it to provide background about their students and others using this component as an outline of what they said to students. Finally, the extension option was rarely used and tended to provide little detail.

Dimension 2: standards alignment. Elementary teachers were more consistent than were secondary teachers in their specification of standards for the modules. When providing lower ratings for this dimension, the expert raters noted a few issues. First, modules tended to have reading standards, but were less likely to have focused writing standards to support the essays being written by the students. Second, some of the adapted modules included multiple-grade standards that did not align with the grade level listed. Because of the limited backgrounds and reflections provided it was difficult for the expert raters to determine whether this was done purposefully or not. Third, some of the adapted modules included standards from states other than California.

Dimension 3: fidelity to LDC module instruction. Expert raters noted some overarching trends regarding modules that received higher versus lower levels of fidelity. First, those modules with stronger fidelity tended to have stronger standards alignment. Second, modules that showed lower fidelity tended to be missing sufficient transition to writing standards and mini-tasks. Third, many modules included a mini-task on writing body paragraphs, but failed to provide instruction on how to write introductory and closing paragraphs.

Dimension 4: quality instructional strategies. Raters noted two trends that impacted their ratings of the instructional strategies. First, mini-tasks were not always well organized, making it difficult to determine what was being taught on a daily basis. Second, multiple issues with student work were encountered. This included attachments that were hand written and difficult to read as well as work that appeared to be from a previous administration of the module. Expert raters also noted that it was easier to measure quality when teachers included the completed rubrics with the student work samples.

Dimension 5: coherence and clarity of module. The expert raters found the student work to be vital to measuring the coherence and clarity of the modules. This was especially true for modules that included multiple work samples at varying levels as well as those that included pre-writing and not just final papers.

Dimension 6: overall impressions. Feedback on the overall quality of the modules tended to mimic the ratings of coherence and clarity. Modules that received higher ratings on Dimension 5 also received higher ratings on Dimension 6. In part, this had to do with the rater's ability to discern how well the module was actually realized as evidenced in the student work

samples, student background, and teacher reflection sections. In addition, modules that seemed ready to be implemented as written tended to be considered higher in overall quality.

5.5 Summary of Results

Based on the primary analyses, teachers during the 2017–2018 school year were at least moderately successful in their development of high quality modules. When examining the overall samples, mean ratings were in the low to high threes for the elementary modules and in the low to mid threes for the secondary modules. In addition, when looking at the individual ratings, the largest proportion of modules received ratings of three or four, indicating that the modules were moderately to sufficiently present or realized. The only exception involved Dimension 1, involving the effective writing task, for the elementary sample with 43% of modules receiving a rating of five, or fully present or realized.

Modules submitted by elementary and secondary teachers also tended to have different strengths. More specifically, elementary teachers performed strongest in how they set up the modules (Dimensions 1 and 2), with means in the high threes and more than 60% of the modules receiving ratings of four or five. In contrast, while secondary teachers still performed stronger regarding Dimension 1, they performed slightly better in their fidelity to LDC instruction (Dimension 3) than they performed in regards to their standards alignment (Dimension 2).

Differences were also found when examining the subgroup results for the elementary and secondary teachers. For example, elementary teachers tended to perform stronger in how they set up the modules than in how they carried them out. More specifically, means were greatest for Dimensions 1 and 2 for the ELA modules as well as each of the cohort subgroups (Cohort 1 returning, Cohort 1 new, and Cohort 2). Similarly, means were greatest for Dimensions 1 and 3 for the science and social studies modules. In contrast, many of the secondary subgroups performed stronger on some of the less foundational dimensions, such as the quality of instructional strategies.

An exploratory analysis was also conducted to examine growth in performance for the five elementary and 14 secondary Cohort 1 returning teachers who submitted complete modules with student work during both the 2016-2017 and 2017-2018 school years. While significance cannot be determined because of the small sample sizes, mean ratings did improve for the majority of dimensions. The only exceptions involved the quality of instructional strategies (Dimension 4) and coherence and clarity (Dimension 5) for the elementary teachers, and standards alignment (Dimension 2) for the secondary teachers. Finally, the greatest increases in mean ratings were for fidelity to LDC instruction (Dimension 3) among the elementary teachers and quality instructional strategies (Dimension 4) for the secondary teachers.

6.0 Fidelity of Implementation Analysis

This chapter describes the descriptive results of the fidelity of implementation to the LDC model at NYCDOE schools. UCLA CRESST and LDC collaborated to create a fidelity matrix to measure schools' fidelity of implementation across four key components of the LDC model. Within the matrix, each key component is measured via multiple indicators, with 14 indicators total across these four key components.

In this chapter, we will first present the overall results on school- and program-level fidelity scores for all the indicators. We will then provide more detailed descriptive results with sections for each of the four key components and sub-sections for each of the 14 fidelity metrics.

6.1 School- and Program-Level Fidelity of Implementation Scores

Table 6.1 provides a summary for how LDC schools performed across the four key components and their associated 14 indicators of fidelity of implementation. As noted in Chapter 2, schools were rated on four-point scales (from 0 to 3) on each indicator. At the school level, adequate implementation was defined as a score of at least 2 (with the exception of principal mini-task observation where school-level fidelity was set at a score level of 1). For the indicators under Key Component 2, program-level fidelity was met if half or more of the schools met fidelity. For all of the other indicators, program-level fidelity was met if three quarters of schools met fidelity.

As displayed in Figure 6.1, there was great variation across schools in their success in meeting implementation thresholds. Schools met fidelity on a range between zero and nine indicators, with an average of just over four indicators. No schools met fidelity on more than nine indicators, suggesting that even high performance schools have room for growth.

Overall, the analysis revealed that a majority of the schools were not meeting the adequate implementation thresholds. Adequate implementation at the program level was met on just two of the 14 indicators: coach comments on modules and teacher perception of the helpfulness of coach written feedback on modules. Nearly half of the schools also met the threshold for teacher attendance at weekly PLC meetings and teacher leader attendance at quarterly in-person teacher leader meetings, although those proportions were not sufficient for the program to be labeled as having adequate implementation on those indicators. Less than 40% of schools met the thresholds for the other ten indicators. For fidelity to be met on a key component, the fidelity matrix requires that fidelity be met on each of the indicators for that key component. As a result, the analysis for 2017-2018 concludes that fidelity was not met for the four key components.

Table 6.1

Summary Table of School- and Program-Level Fidelity Scores by Indicator in 2017-2018

Key component	Indicator	% of schools with no data	% of schools at Level 0	% of schools at Level 1	% of schools at Level 2	% of schools at Level 3	Program met fidelity?
Key Component 1: Common Planning Time for LDC Professional Learning Community with Synchronous Coach Support	Teacher attendance at weekly PLC meetings	8	34	9	21	28	No
	Amount of time spent on LDC during common planning time	2	19	64	13	2	No
	Exposure to LDC LEARN content during first instructional cycle	0	100	0	0	0	No
	Exposure to LDC LEARN content during second instructional cycle	0	98	0	0	2	No
	Perceived effectiveness of engagement in PLC on teacher competencies	15	25	4	25	32	No
Key Component 2: Asynchronous Support from LDC Coaches	Coach comments on modules	6	26	11	13	43	Yes
	Coach formative peer review on modules	6	85	2	4	4	No
	Teacher perception of the helpfulness of coach written feedback on modules	15	17	11	9	47	Yes
Key Component 3: Teacher Implementation Activities	Module editing	0	75	9	6	9	No
	Module implementation	0	91	6	0	4	No
Key Component 4: Leadership Support at Different Levels	Frequency of coach/teacher leader monthly meetings	2	17	47	19	15	No
	Administrator attendance at quarterly in-person administrator meetings	0	32	36	17	15	No
	Teacher leader attendance at quarterly in-person teacher leader meetings	0	15	36	34	15	No
	Principal mini-task observation	15	43	6	9	26	No

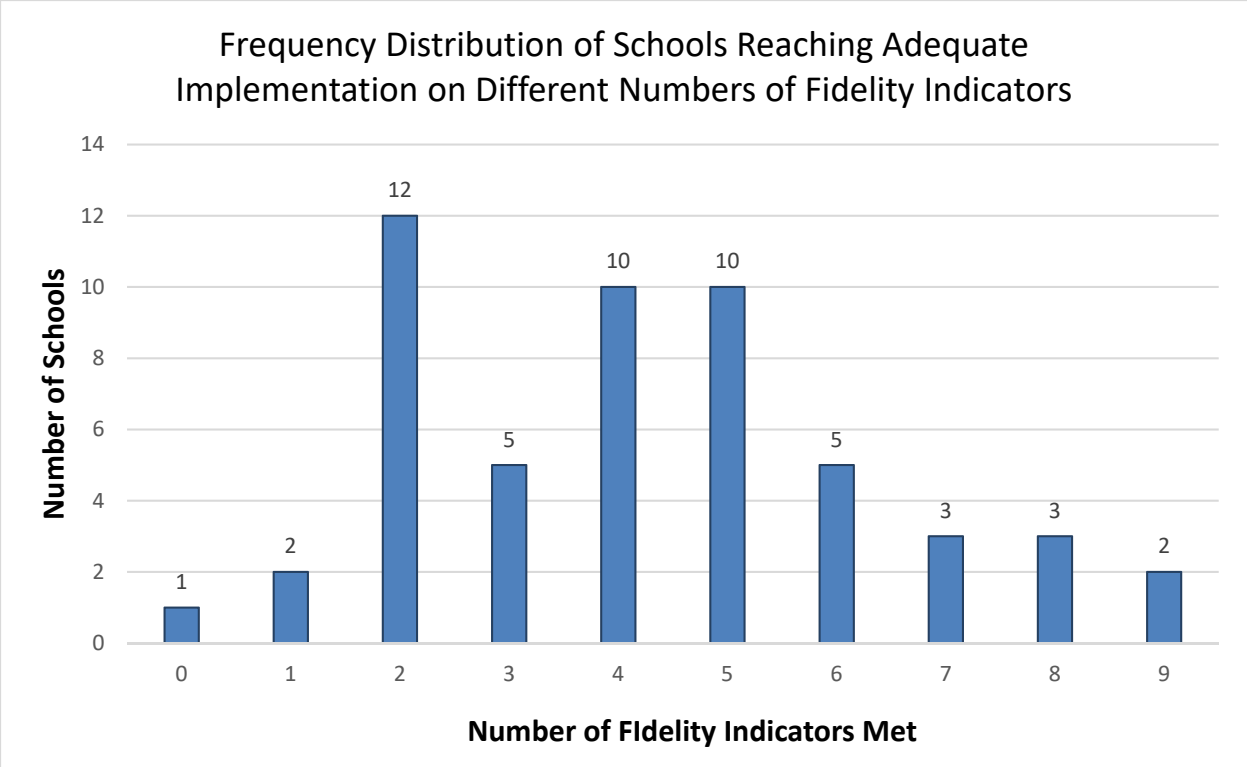

Figure 6.1. Frequency Distribution of Schools Reaching Adequate Implementation on Different Numbers of Fidelity Indicators

6.2 Key Component 1: Common Planning Time for LDC Professional Learning Community with Synchronous Coach Support

Schools varied greatly in their level of fidelity on the five indicators of Key Component 1, as shown in Figure 6.2. Schools were most successful with regards to Perceived Effectiveness of Engagement in PLC on Teacher Competencies and Teacher Attendance at Weekly PLC Meetings with a little over half (57%) and a little under half (49%) meeting fidelity on those metrics respectively. Only 15%met fidelity on Amount of Time Spent on LDC During Common Planning Time. Meeting fidelity on the indicators of exposure to LDC LEARN content was nearly uniformly challenging for schools, with no schools reaching the adequate implementation threshold for the first instructional cycle and just one school reaching the threshold for the second instructional cycle.

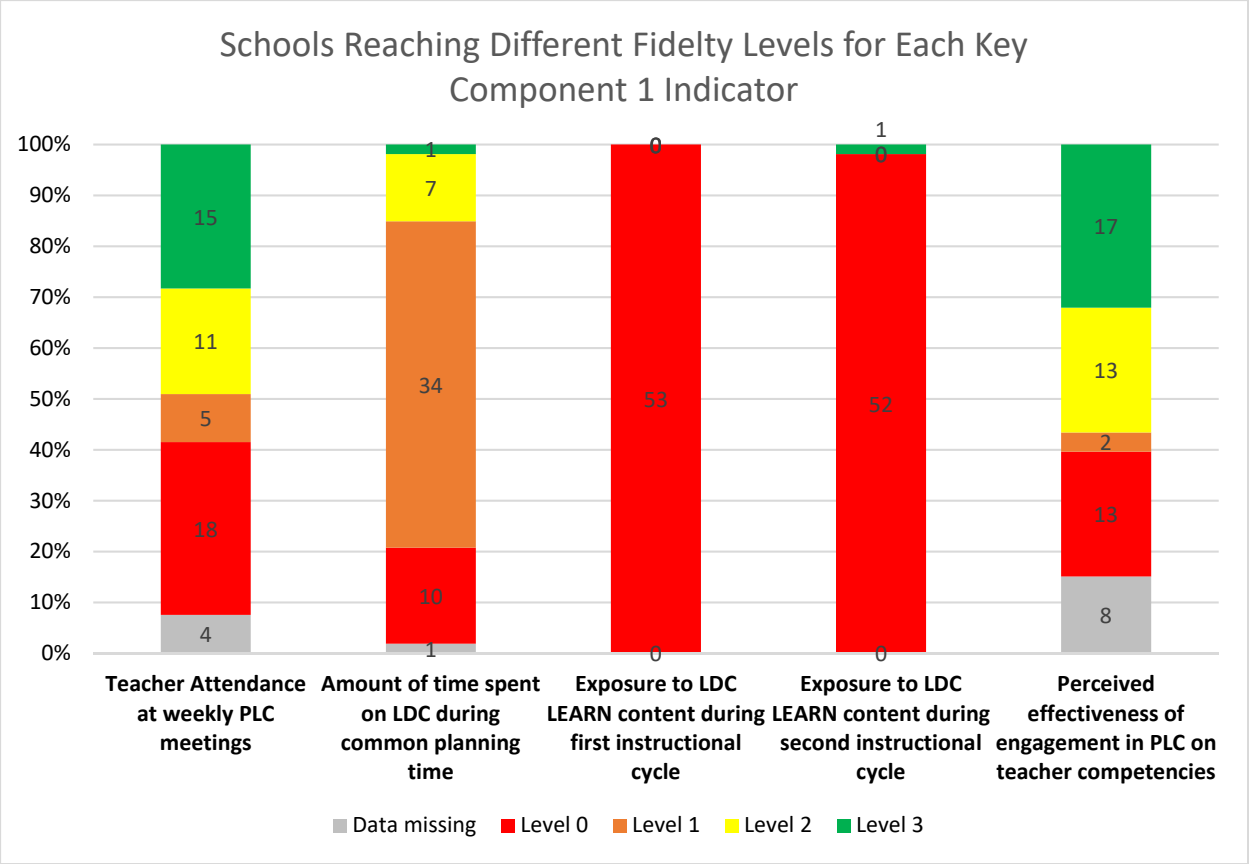

Figure 6.2. Number of Schools Reaching Different Fidelity Levels for Each Key Component 1 Indicator

Teacher Attendance at Weekly PLC Meetings. PLC Reflection data show that schools varied greatly in terms of the number of times their PLCs met over the course of the 2017-2018 school year. The number of sessions ranged from zero to 25 times, with PLCs on average meeting 11.8 times. This is important context for the interpretation of the teacher attendance at weekly PLC meetings fidelity indicator. The indicator measures the proportion of teacher who regularly attended sessions, but does not incorporate the amount of times that the PLC met across the year. Although success in the two facets of attendance seems to be somewhat correlated, there were cases where teacher attendance rates were high but the school met a below average number of times. And likewise there were cases where schools met a large number of times but individual attendance rates were poor.

Attendance rates across the full population of PLC participants varied a great deal, ranging from 6 to 100%and averaging 79%. Not surprisingly, teacher leaders who also taught in classrooms (n=33) attended at higher average rates than classroom teachers not playing a leadership role (n = 243): 82%compared to 79%. Teacher leaders in out of classroom assignments (n=21) attended at lower rates (69%). The adequate implementation threshold for individual teacher attendance was 80%or greater, and 230 out of 339 PLC participants (68%) reached this threshold. While a majority of teachers in a majority of schools reached this

threshold, there was a very substantial minority of schools that experienced low attendance rates.

Amount of Time Spent on LDC During Common Planning Time. This metric is based on PLC reflection data for the subset of PLC sessions that coaches joined either digitally or in person. Overall, teacher leaders reported that 146 sessions were under 45 minutes long (23%), 372 sessions were between 45 and 59 minutes (60%), 84 sessions were between 60 and 74 minutes (14%), and 22 sessions were between 75 and 90 minutes (4%).

School-level scores were based on the modal (most common) response on the PLC reflection form. For 10 of the schools, that response was under 45 minutes, for 34 of the schools it was 45-59 minutes, for seven of the schools it was 60-74 minutes, and for one of the schools it was 75-90 minutes. Because of the nature of the data, we cannot ascertain the exact length of the sessions. As such it is possible that many of the sessions recorded as 45-59 minutes came quite close to the desired 60 minutes of PLC time. Nevertheless, according to the thresholds set, a majority of the schools did not meet fidelity on this indicator. It may make sense for LDC to update its instrument to collect more fine-grained data on this indicator.

Exposure to LDC LEARN Content During First and Second Instructional Cycles. Here we report on the two indicators measuring PLC participants' engagement with the LEARN online course content (instructional courses that help LDC participants learn how to navigate an LDC instructional cycle). Of the 366 teachers and teacher leaders participating in LDC PLCs in 2017-2018, 249 participants (68%) did not view *any* LEARN content through their user accounts. The remaining 117 participants viewed at least one session in one instructional cycle. And a subset of that group (n=64) viewed at least one session in a second instructional cycle. Overall the full population of teachers and teacher leaders on average were exposed to 9% of the LEARN sessions in the first instructional cycle and 5% of the LEARN sessions in the second instructional cycle.

It is possible that teachers were not complying with instructions to engage with the LEARN content within their own user accounts but were still exposed to some of the content in the group setting of the PLC. Nevertheless, even if we examine only those participants with any exposure to LDC in the first instructional cycle (n=117), that smaller group still only was exposed to an average of 29%of the sessions. Most teachers were not being exposed to the majority of LEARN sessions in their first instructional cycle, with even lower results in the second instructional cycle.

Due to the overall low fidelity at the teacher level, nearly all of the schools scored at the lowest fidelity level for both exposure to LEARN content indicators. The only exception was one school that performed at a high level on the second instructional cycle. The overall low performance of schools on this indicator, however, masks variation across the schools in performance. Most significantly, 21 out of 54 of the schools (39%) had zero teachers with any

exposure to LEARN content via their user accounts. On the high end, a small number of schools' PLC members were exposed on average to 40-45% of the LEARN content.

Perceived Effectiveness of Engagement in PLC on Teacher Competencies. This indicator is based on the 210 teachers who provided data on question 30 in the teacher survey (see Appendix A), which asks teachers to report how much their skills had improved in a number of areas aligned with LDC core competencies. Here we base fidelity levels on an index averaging the seven question 30 items, which are each measured on a 1 to 4 scale. The threshold for adequate implementation at the teacher level is an index score of 3, corresponding to the survey response reporting moderate improvement in the skill area. Across the whole sample, 17 teachers had scores of 1 to less than 2 (no to a little improvement), 40 had scores of 2 to less than 3 (a little to moderate improvement), 104 had scores of 3 to less than 4 (moderate to great improvement), and 49 had scores of 4 (great deal of improvement). A little less than three quarters of respondents in the sample reached the adequate implementation threshold score of 3 on the index.

There was a great deal of variation in survey responses both within and across schools. In 12 schools, half or fewer of the teachers reported a moderate effect on the competencies. On the other hand, 100%of respondents in 17 schools reported a moderate or greater effect. The variation can be clearly seen in Figure 6.2.

6.3 Key Component 2: Asynchronous Support from LDC Coaches

As with Key Component 1, there was a great deal of variation across schools in their level of fidelity on the three Key Component 2 indicators, as shown in Figure 6.3. Nevertheless, a majority of schools met the adequate implementation thresholds for coach comments on modules and teacher perception of the helpfulness of coach written feedback on modules, and as a result the program met fidelity on these two metrics. Coach peer review was not a broadly used tool, with only a handful of schools meeting fidelity on this indicator. Together, the findings suggest that the program was fairly successful with regard to coaches providing useful feedback to LDC participants, although expectations were not being met for the use of the more comprehensive peer review tool as a formative feedback mechanism.

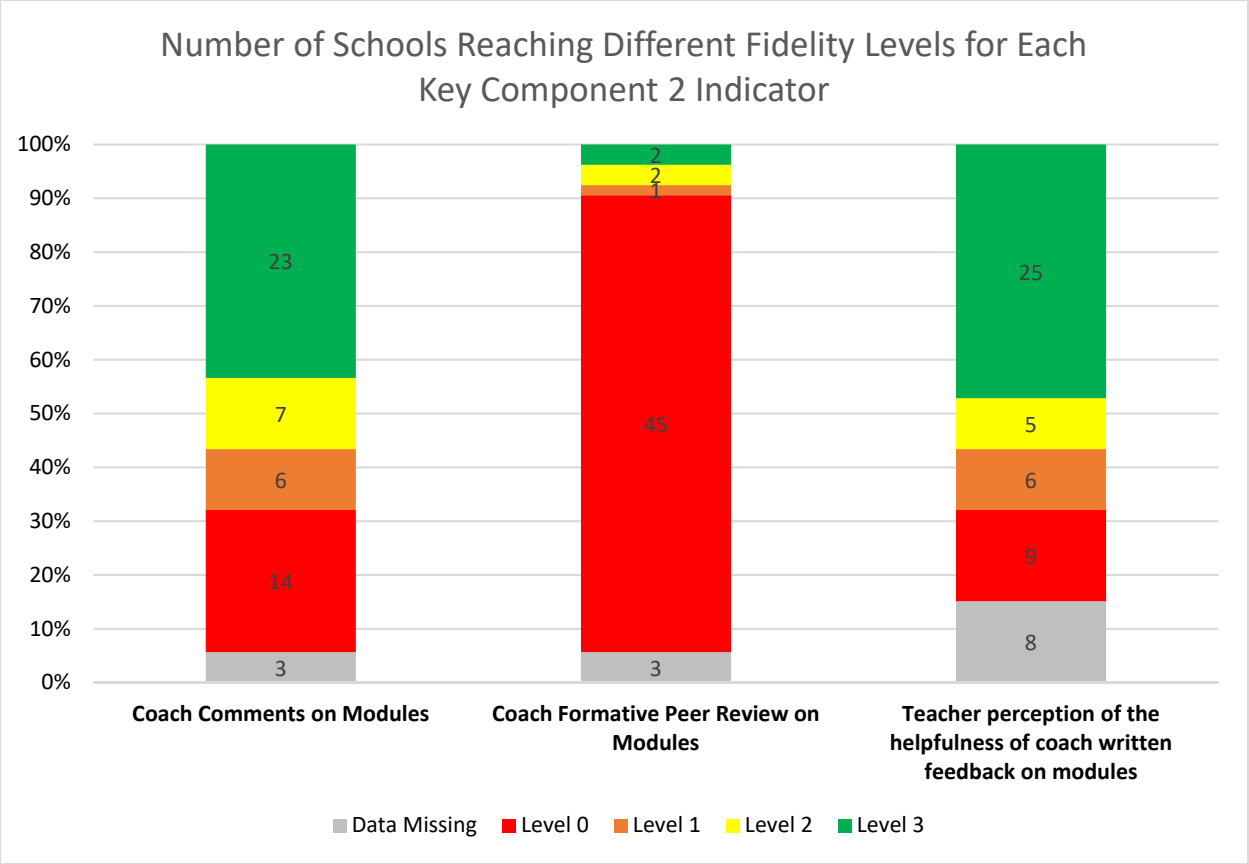

Figure 6.3. Number of Schools Reaching Different Fidelity Levels for Each Key Component 2 Indicator

Coach Comments on Modules. Results on this indicator are based on the universe of modules linked to a LEARN instructional cycle. In total there were 210 modules linked to courses across 50 of the 53 schools, with the number of linked modules per school ranging from one to seven. Those modules in turn received between 0 and 21 comments from coaches (26 modules received 0 comments). An adequate level of feedback on a linked module was defined as having received two or more coach comments, and 156 out of the total 210 modules (74%) met that threshold. The proportion of modules within schools that met the two comment threshold varied a great deal across schools, which accounts for the variation in school level fidelity scores as seen in Figure 6.3.

Coach Formative Peer Review on Modules. Results on this indicator are based on the universe of teachers and teacher leaders who co-authored at least one linked course. That population includes 246 participants across 50 schools. At the teacher level, fidelity was defined as having received at least one peer review from a coach. Only 46 teachers received at least one peer review from their coach, and therefore only 8%of the schools met the school-level fidelity threshold.

Teacher Perception of Helpfulness of Coach Written Feedback on Modules. Across 212 teacher survey respondents, 168 teachers (79%) reported using written feedback on modules

and finding it moderately to very helpful. Across schools, the proportion of teachers who reported at least moderate usefulness ranged from 13 to 100%(with data not available for eight schools as a result of a 0%survey response rate at those locations). A majority of schools met the adequate implementation threshold, and therefore the program as a whole met fidelity on this metric.

6.4 Key Component 3: Teacher Implementation Activities

Here we report on indicators related to teachers' engagement with the process of designing and implementing LDC modules. As shown in Figure 6.4, schools were more successful in terms of meeting thresholds for the proportion of their teachers who engaged deeply in the design process by editing key portions of modules, with about 15%of schools meeting fidelity on this indicator. In only two schools did three quarters or more of teachers implement two modules, as measured by the uploading of student work samples.

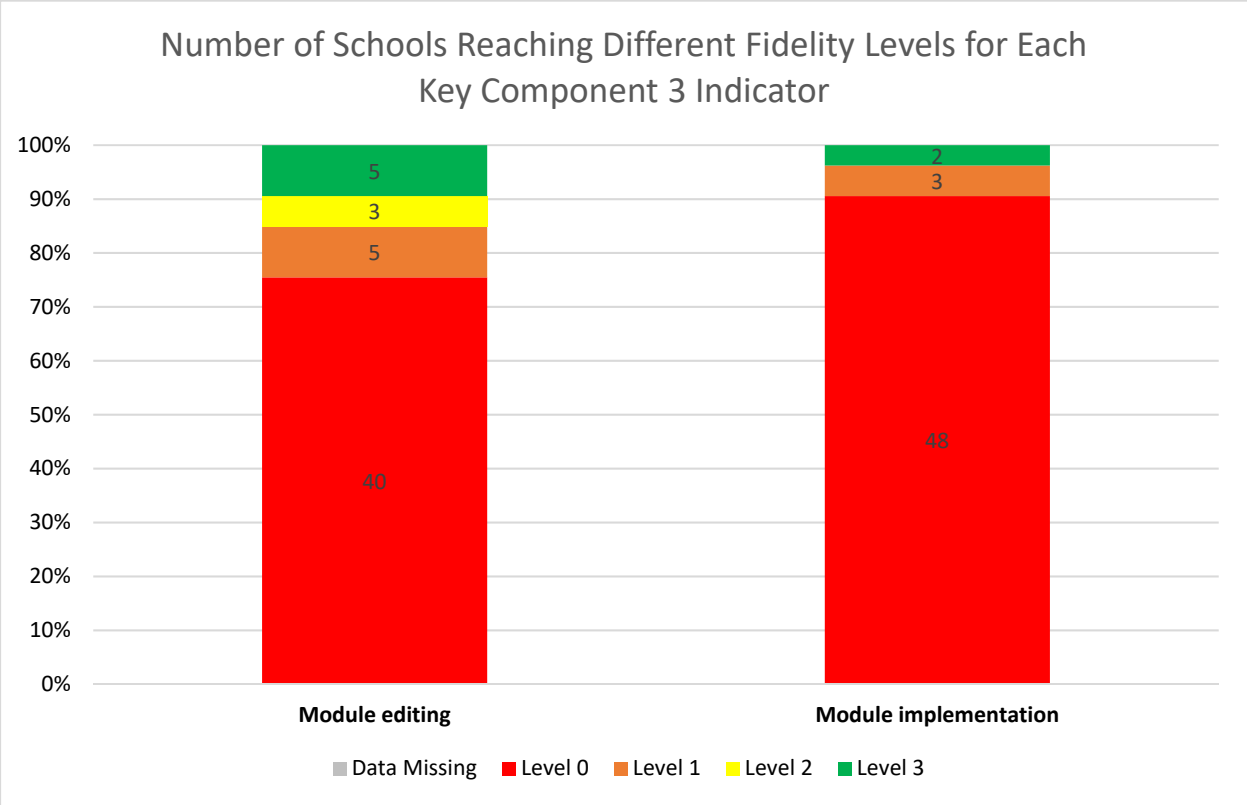

Figure 6.4. Number of Schools Reaching Different Fidelity Levels for Each Key Component 3 Indicator

Module Editing. As outlined in the fidelity matrix, teacher-level fidelity levels are built in a step ladder fashion. To meet fidelity level 1, a teacher needed to edit at least one task in a module. To meet fidelity level 2 (adequate implementation), a teacher needed to reach the level 1 threshold and edit either standards or text in at least one module. To reach fidelity level

3, a teacher had to meet the previous requirements and also edit either skills and mini-tasks or the rubric.

Out of 366 teachers and teacher leaders, 66%failed to meet the threshold of editing the teaching task in one module and therefore implemented at fidelity level of zero. Seven participants (2%) edited a task, but did not edit standards or texts, and therefore were at fidelity level 1. A total of 117 participants (32%) met the adequate implementation threshold, with 39 (11%) scoring at level 2 (edited standards or texts but not skills/mini-tasks or rubric) and 78 (21%) scoring at level 3 (edited standards or text AND skills/mini-tasks or rubric). As a result of just one third of participants overall meeting the teacher-level adequate implementation threshold, only 15%of schools met the school level threshold for adequate implementation.

Module Implementation. For this indicator, our sample is the 346 classroom teachers who participated in LDC in 2017-2018 (as the metric involves classroom implementation, out of classroom staff are excluded). The upload of student work serves as a proxy for whether the teacher implemented a module in her classroom. The number of teachers with uploaded student work ranged from zero to eight with a mean of 0.66. Two hundred eleven teachers (61%) didn't upload student work to any modules. Seventy-four (21%) uploaded student work to one module, and 45 (13%) uploaded to two modules. Sixteen teachers (5%) uploaded student work to 3 or more modules. Overall, less than 20%of teachers met the adequate implementation threshold; with these teachers being spread across many schools, only two schools met fidelity on the indicator.

6.5 Key Component 4: Leadership Support at Different Levels

As depicted in Figure 6.5, there was a great deal of variation across schools on each of the Key Component 4 metrics. Depending on the metric, between a third and a half of schools met fidelity. These results were not positive enough for fidelity to be met at the program level on any of the metrics.

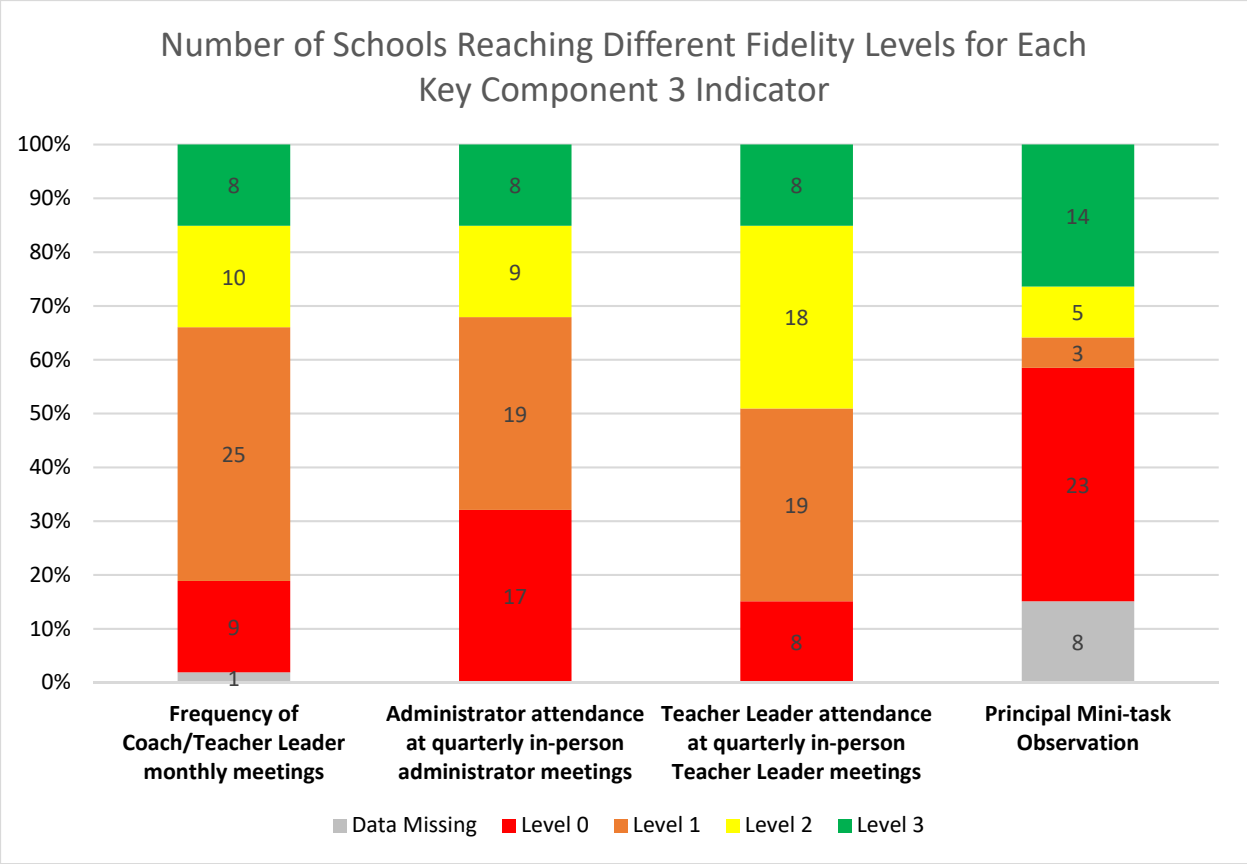

Figure 6.5. Number of Schools Reaching Different Fidelity Levels for Each Key Component 3 Indicator

Frequency of Coach/Teacher Leader Monthly Meetings. Teacher leaders reported meeting with their coach between one and 22 times with a mean of 7.6 times, according to PLC reflection data. The adequate implementation threshold was set at nine or more coach/teacher leader meetings across the school year, and only 18 of 53 schools (34%) met that threshold. Twenty-five of 53 schools (48%) met between four and eight times (low implementation) and nine (17%) met less than four times (very low implementation).

Administrator Attendance at In-Person Administrator Meetings. Administrators had the opportunity to attend three events. Administrators in eight schools (15%) attended all three events, in nine schools (17%) attended two events, in 19 schools (36%) attended one event, and in 17 schools (32%) attended zero events. With the adequate implementation threshold set at two events, 17 schools (32%) met the threshold.

Teacher Leader Attendance at Quarterly In-Person Teacher Leader Meetings. Teacher leaders also had the opportunity to attend three events. Teacher leaders in 8 schools (15%) attended all three events, in 18 schools (34%) attended two events, in 19 schools (36%) attended one event, and in eight schools (15%) attended zero events. With the adequate implementation threshold set at two of three events, 26 out of 53 (49%) schools met the threshold.

Principal Mini-Task Observation. Thirty-six percent of teacher survey respondents reported never having been observed by an administrator when teaching an LDC mini-task, 28%reported being observed once, 10%reported being observed twice, and 16%reported being observed three or more times. Despite almost two thirds of respondents reporting having been observed, less than half of schools met the adequate implementation threshold of three quarters of teachers having been observed. Fidelity was therefore not met for the program as a whole on this metric.

6.6 Summary of Results

In summary, the fidelity matrix analysis revealed that none of the schools met fidelity requirements on the four key components in 2017-2018 in New York. The ability of PLCs to set aside common planning time that worked for all teachers varied across schools. The frequency of meetings ranged broadly, as did the attendance rates of the participants. About half of schools were able to ensure that at least three quarters of their teachers attended PLC meetings at high rates. When PLCs did meet, they most often met for between 45 and 59 minutes, although many sessions also lasted the desired 60 minutes or more. LDC intended for teachers to be exposed to key online course content within PLC time, but by and large this did not happen. Many participants did not view any LEARN content in their user accounts (although they may have been exposed to the content via a peer or coach's account), and those that did tended to view a minority of sessions in the instructional cycle. The evidence suggests that many participants did not embark on a second instructional cycle. Given the wide variety of experiences that schools and teachers had with common planning time, it is not surprising that teachers reported a variety of attitudes with regards to the effectiveness of PLC in building teacher skills.

Results on asynchronous support were a bright spot in the fidelity analysis. A majority of schools met expectations for coaches providing written feedback on modules, and teachers reported that this feedback was useful in a majority of schools (LDC met fidelity on these two metrics). Coach peer review on the other hand was infrequently utilized.

Results on module editing suggest that many teachers were not heavily engaged in the design process, with two thirds of teachers not having edited any teaching tasks. Those that did edit the teaching task tended to also edit either standards or texts, and were also more likely than not to reach the stage of editing skills/mini-tasks and the rubric. Only about 40%of teachers uploaded student work to at least one module, and just 18%uploaded student work to two or more modules.

Results on leadership support varied greatly across schools. There were clearly schools where leadership support was high, with teacher leaders and administrators attending professional development opportunities, teacher leaders regularly meeting with coaches, and administrators observing LDC instruction. But a majority of schools did not meet expectations in these areas.

Variation across schools was substantial, with some schools meeting fidelity on as many as seven to nine indicators, and on the other end, some schools struggling with nearly every aspect of implementation. No patterns emerged for cohort and school level subgroups with Cohort 1 and Cohort 2 schools and elementary and secondary schools meeting similar levels of fidelity, despite great variation within each of the subgroups. Analysis of implementation in 2018-2019 will yield additional information on how fidelity changes over time.

7.0 Student Outcome Analysis

This section presents the student outcome analysis we conducted to evaluate LDC's impact on student learning in the 2017−2018 school year. As described earlier, our LDC teacher sample included both elementary and middle school teachers from two cohorts of LDC schools in NYCDOE. Some of the LDC teachers in Cohort 1 schools were in their second year of LDC implementation (having participated in 2016−2017) and some of the teachers newly joined the existing PLCs in 2017−2018. LDC teachers from Cohort 2 school were all in their first year of participating in LDC in 2017−2018. Separate sampling and analyses were conducted for three groups of teachers: Cohort 1 returning middle school teachers, Cohort 2 elementary school teachers, and Cohort 2 middle teachers.

We could not conduct analyses for the other groups of teachers because of sample sizes. More specifically, we could not conduct meaningful analyses of the impact of Cohort 1 returning or Cohort 1 new elementary school teachers due to the small number of students who were taught by these Cohort 1 teachers and for whom we have their 2015-2016 baseline data. There was also too small a number of students taught by Cohort 1 new middle school teachers in 2017−2018 to conduct meaningful analyses.

We begin this chapter by describing the process we used to define the LDC student samples for each analysis and to construct matched comparison samples. We then present descriptive statistics for the treatment and comparison groups. Finally, we report the estimated impact of LDC on students as measured by their New York State Assessment ELA scores.

7.1 LDC Sample and the Matching Process

As described earlier, our LDC teacher sample included both elementary and middle school teachers in the study district. Separate sampling and analyses were conducted for these two groups of teachers, as described in Section 2.5 of this report (Analytical Approaches).

Cohort 1 returning middle school sample. The eligible LDC sample for the Cohort 1 returning middle school analysis includes all students (1) who were enrolled in one school campus for the entire 2017−2018 school year under the instruction of at least one of the participating LDC teachers in their second year of LDC participation, and (2) for whom prior achievement scores, outcome year achievement scores, and demographic data were available. Achievement and demographic data were used in the matching process.

The 2017−2018 Cohort 1 returning middle school sample prior to the CEM process included ten schools, 26 Cohort 1 returning middle school teachers who consented to participate in the evaluation study, and their 1,626 students. After the student-level matching, our final Cohort 1 returning middle school LDC sample included 1,511 students and the same number of teachers and schools prior to matching (see Table 7.1).

Prior to matching, the potential middle school comparison sample consisted of 514 schools, 9,871 teachers, and 151,030 students. This comparison sample was substantially reduced during the first stage of matching, which identified up to five schools that closely resembled each of the ten LDC middle schools. After student-level CEM, a workable analytic comparison sample consisted of 43 schools, 753 teachers and 1,511 students.

Table 7.1

Before and After Matching Sample Sizes: Cohort 1 Returning Middle School Analysis

	LDC sample			Comparison sample		
Stage	Schools	Teachers	Students	Schools	Teachers	Students
Stage 1						
Before matching	10	26	1,626	514	9,871	151,030
After matching	10	26	1,626	50	911	12,602
Stage 2						
After matching	10	26	1,511	43	753	1,511

Cohort 2 elementary sample. As with the Cohort 1 analysis, the eligible LDC sample for the Cohort 2 elementary school analysis includes all students (1) who were enrolled in one school campus for the entire 2017−2018 school year under the instruction of at least one of the participating LDC teachers, and (2) for whom prior achievement scores, outcome year achievement scores, and demographic data were available. Achievement and demographic data were used in the two stage matching process.

Table 7.2

Before and After Matching Sample Sizes: Cohort 2 Elementary School Analysis

	LDC sample			Comparison sample		
Stage	School	Teacher	Student	School	Teacher	Student
Stage 1						
Before matching	14	57	1,351	781	10,722	120,696
After matching	14	57	1,351	70	1,962	9,722
Stage 2						
After matching	14	54	1,258	65	538	1,258

As reported in Table 7.2, the resulting LDC sample included 14 schools, 57 teachers, and 1,351 students prior to the CEM process. After the CEM student-level matching, our final Cohort 2 elementary LDC sample was reduced to 1,258 students. Prior to matching, the potential comparison sample consisted of 781 schools, 10,722 teachers and 120,696 students. This comparison sample was substantially reduced during the first stage of matching, which identified up to five schools that most closely resembled each of the 14 LDC schools. After student-level CEM, a workable analytic comparison sample of 65 schools, 538 teachers, and 1,258 students was constructed.

Cohort 2 middle school sample. The eligible LDC sample includes all students (1) who were enrolled in one school campus for the entire 2017−2018 school year under the instruction of at least one of the participating LDC teachers, and (2) for whom prior achievement scores, outcome year achievement scores, and demographic data were available. Achievement and demographic data were used in the matching process. Again, we employed a two stage matching process to select schools and students.

As shown in Table 7.3, the resulting Cohort 2 LDC middle school sample included 10 schools, 31 teachers, and 1,396 students prior to the CEM process. After the CEM student-level matching, our final secondary LDC sample was reduced to 1,285 students.

Table 7.3

Before and After Matching Sample Sizes: Cohort 2 Middle School Analysis

	LDC sample			Comparison sample		
	Schools	Teachers	Students	Schools	Teachers	Students
Stage 1						
Before matching	10	31	1,396	516	9,897	156,773
After matching	10	31	1,396	50	968	14,651
Stage 2						
After matching	10	31	1,285	41	651	1,285

Prior to matching, the potential comparison sample consisted of 516 schools, 9,867 teachers and 156,773 students. This comparison sample was substantially reduced during the first stage of matching, which identified up to five schools that closely resembled each of the 10 LDC schools. After student-level CEM, a workable analytic comparison sample of 41 schools, 651 teachers, and 1,285 students was constructed (see Table 7.3).

7.2 Descriptive Results on the Matched Analytic Samples

Tables 7.4, 7.5 and 7.6 present the characteristics of the LDC student and comparison students in the final analytical samples for the Cohort 1 returning middle school, Cohort 2 elementary, and Cohort 2 middle school analyses respectively. Treatment and comparison samples matched very closely. Exact matching was achieved on some variables, and all demographic variables were within four percentage points. We used spring 2018 New York State Assessment ELA scores as our outcome measures in all analyses. The Cohort 1 analysis used the spring 2016 New York State ELA Assessment as one of the matching variables while the Cohort 2 analyses used the spring 2017 ELA assessments.

For the prior achievement matching variable, we standardized New York State Assessment scores at each grade level relative to district performance, based on the district mean and standard deviation for the ELA test at each grade level. Standardizing scores in this way enables us to easily compare our samples' performance relative to the district's and to compare scores across grades and years more easily. A standardized scale score of zero, for example, indicates that the student scored at the mean for all other students in the district who took the same test. A standardized scale score of 1.0 meant that the student scored one standard deviation higher than the district mean. Conversely, a standardized scale score of -1.0 indicated that the student scored one standard deviation lower than the district mean.

The final LDC Cohort 1 middle school student sample after matching was comprised largely of students eligible for free or reduced price lunch (see Table 7.4). Slightly more than half of students were Hispanic and about a third were black, and the sample was well distributed across the three grade levels in the baseline year (sixth, seventh, and eighth grade in 2017−2018). Special education students represented about one-quarter of this sample, while English language learners represented slightly more than 10%. Mean performance on the prior year assessments was more than one-third of a standard deviation lower than the district-wide performance levels in both mathematics and ELA.

The final Cohort 2 LDC elementary student sample (see Table 7.5) was also more than one half Hispanic and about a third black. Most students were eligible for free and reduced priced lunches. The sample was quite evenly distributed between students in third (51.8%) and fourth grade (48.2%) in the prior year. English language learners represented slightly more than 15% of this sample, while special education students represented slightly less than one quarter of the sample. In addition, mean performance on the prior year ELA assessments was about one-quarter of a standard deviation lower than the district-wide performance level, while mean performance on the prior year math assessment was about one-third of a standard deviation lower than the district-wide performance level.

As shown in Table 7.6 the final Cohort 2 LDC middle school student sample included a large combined proportion of Black (51.2%) and Hispanic students (34.0%), and a large majority of students with low socioeconomic backgrounds (80.8%). Slightly over one half of the sample

included students that were in fifth grade (26.4%), and sixth grade (25.1%) in the prior year, with the remainder (48.5%) in seventh grade in the prior year. English language learners represented more than one tenth of this sample, while less than one quarter of the sample included special education students (23.8%). In addition, mean performance on the prior year assessment for LDC students was substantially lower when compared to district-wide performance levels in mathematics and ELA.

Table 7.4

2015-2016 Student Characteristics of the Cohort 1 Returning Middle School Treatment and Comparison Groups After Matching

Student characteristic	Treatment group (*n* = 1,511)	Comparison group (*n* = 1,511)
Race/ethnicity		
Hispanic (%)	53.5	53.5
Black (%)	32.2	32.2
Asian (%)	3.5	3.5
White (%)	9.9	9.6
Other (%)	0.9	1.2
Female (%)	53.6	53.6
Special programs status		
Poverty (%)	87.2	87.2
English language learner (%)	10.8	10.8
Special education (%)	25.6	23.6
Student prior achievement		
Mean baseline year mathematics Z score	-0.406	-0.391
Mean baseline year ELA Z score	-0.334	-0.326
Class & teacher characteristics		
Mean baseline ELA Z score of current peers	-0.370	-0.348
Teacher years of experience	8.0	7.2
Grade level at baseline year		
Grade 4 in 2015−2016 (%)	34.1	34.1
Grade 5 in 2015−2016 (%)	37.0	37.0
Grade 6 in 2015−2016 (%)	28.9	28.9

Table 7.5

2016-2017 Student Characteristics of the Cohort 2 Elementary School Treatment and Comparison Groups After Matching

Student characteristic	Treatment group (*n* = 1,258)	Comparison group (*n* = 1,258)
Race/ethnicity		
Hispanic (%)	56.0	56.0
Black (%)	35.6	35.6
Asian (%)	3.0	3.5
White (%)	3.8	3.7
Other (%)	1.5	1.2
Female (%)	50.9	52.6
Special programs status		
Poverty (%)	85.0	86.3
English language learner (%)	15.3	12.2
Special education (%)	22.9	20.4
Student prior achievement		
Mean baseline year mathematics Z score	-0.320	-0.331
Mean baseline year ELA Z score	-0.247	-0.237
Class and teacher characteristics		
Mean baseline ELA Z score of current peers	-0.244	-0.245
Teacher years of experience	12.7	12.2
Grade level at baseline year		
Grade 3 in 2016−2017 (%)	51.8	51.8
Grade 4 in 2016−2017 (%)	48.2	48.2

Table 7.6

2016-2017 Student Characteristics of the Cohort 2 Middle School Treatment and Comparison Groups After Matching

Student characteristic	Treatment group (*n* = 1,285)	Comparison group (*n* = 1,285)
Race/ethnicity		
Hispanic (%)	34.0	34.0
Black (%)	51.2	51.2
Asian (%)	11.5	7.5
White (%)	2.4	5.1
Other (%)	0.9	2.2
Female (%)	48.2	48.2
Special programs status		
Poverty (%)	80.8	81.6
English language learner (%)	13.6	11.6
Special education (%)	23.8	27.8
Student prior achievement		
Mean baseline year mathematics Z score	-0.540	-0.542
Mean baseline year ELA Z score	-0.409	-0.419
Class & teacher characteristics		
Mean baseline ELA Z score of current peers	-0.434	-0.388
Teacher years of experience	10.9	10.0
Grade level at baseline year		
Grade 5 in 2016−2017 (%)	26.4	26.4
Grade 6 in 2016−2017 (%)	25.1	25.1
Grade 7 in 2016−2017 (%)	48.5	48.5

7.3 Outcome Analysis Results: Cohort 1 Middle School Sample

Analyses were conducted at the middle school level, where the norm was student exposure to multiple teachers. Students could be exposed to anywhere between zero and fourteen different LDC teachers in the 2017–2018 school year. Using a multiple membership multiple classification (MMMC) design, each observation at Level 1 represented one student, which was linked to the ELA, social studies/history, and science teachers that the student was exposed to during the year. Weights across teachers for each student summed to a unity (1).

Two different approaches were used to model the LDC treatment intervention variable as a fixed effect at the student level. The first model was dosage dependent, and took into account variation in middle school students' level of exposure to LDC teachers. In this approach, the treatment variable was structured as a continuous response variable between zero and one, based on exposure to LDC teachers for ELA, social studies/history and/or science. In contrast, the second approach was modeled as dosage independent, and considered any student exposed to any LDC intervention teacher in at least one subject to be a treated individual. In this latter approach the treatment variable was dichotomous, coded as one for LDC treated students and zero for comparison students.

In Table 7.7 we present results of both the dosage dependent and dosage independent models on middle school students' ELA performance in 2017−2018. As can be seen, model results for the LDC effect on student outcomes are in the positive direction, but are not statistically significant for either model. In other words, neither analysis provided sufficient evidence to conclude that students taught by LDC teachers performed better on the ELA test than did their matched peers in the comparison group.

The significant effects of the covariates on student performance also were similar under the two models and were in the expected directions. Prior ELA performance was the strongest predictor and prior mathematics performance also helped explain the outcome. In addition to prior achievement, each of the race/ethnicity variables and three demographic variables helped predict performance: students in special education performed at lower levels than students not in special education, females performed at significantly higher levels than males, and students with low socio-economic status performed at lower levels than did their peers with higher socio-economic status.

Table 7.7

Cohort 1 Returning LDC Middle School Teacher Effect Estimates on 2017-2018 NYS ELA Performance, Dosage-Dependent and Dosage-Independent Models

Variables	Dosage-dependent model coefficient (*SD)*	Dosage-independent model coefficient (*SD*)
Level 2 - LDC teacher treatment	0.025 (0.131)	0.001 (0.052)
Level 1 - student characteristics		
Hispanic	-0.123 (0.049)*	-0.123 (0.049)*
Black	-0.202 (0.054)*	-0.202 (0.054)*
Asian	0.159 (0.074)*	0.159 (0.074)*
Other	-0.260 (0.119) *	-0.260 (0.119) *
Poverty	-0.129 (0.036)*	-0.129 (0.036)*
Female	0.218 (0.025)*	0.218 (0.025)*
English language learner	-0.027 (0.043)	-0.027 (0.043)
Special education	-0.118 (0.031)*	-0.118 (0.031)*
Grade 7	0.081 (0.041)	0.081 (0.041)
Grade 8	0.137 (0.045)*	0.138 (0.045)*
Content Exposure Weeks	0.011 (0.006)	0.011 (0.006)
Teacher Experience	-0.002 (0.004)	-0.002 (0.004)
Baseline Peer ELA Z score	0.221 (0.034)*	0.220 (0.034)*
Baseline year mathematics Z score	0.181 (0.019)*	0.181 (0.019)*
Baseline year ELA Z score	0.558 (0.021)*	0.558 (0.021)*

Note. Based on the dosage-dependent model, the average treated student received a 0.313 treatment dosage. Because of this, using the dosage dependent model we estimate an average treatment on the treated (ATT) at (0.313 * 0.025) = 0.008.
*p = .05.

7.4 Outcome Analysis Results: Cohort 2 Elementary Sample

As with middle school students, elementary students were typically associated with more than one core content teacher; the average treatment student was linked to 2.6 core content teachers and the average comparison student was also linked to 2.6 teachers. For this reason, and to be consistent with the larger middle school analysis, we employed a multi-membership multiple classification (MMMC) design for the elementary analysis. Two different approaches were used to model the LDC treatment intervention variable as a fixed effect at the student level. The first model was dosage dependent, which took into account some variation in elementary students' level of exposure to LDC teachers. In this approach the treatment variable

was structured as a continuous response variable between zero and one, based on exposure to LDC teachers for ELA, social studies/history, and/or science. In contrast, the second approach was modeled as dosage independent and considers any student exposed to any LDC intervention teacher via at least one subject as a treated individual. In this latter approach, the treatment variable was dichotomous, coded as one for LDC treated students and zero for comparison students. The outcome variable for both models was students' 2017 New York State assessment scores in ELA. For technical reasons of evaluating effect sizes, New York State outcome assessment scale scores were standardized to the study sample.

As can be seen in Table 7.8, model results for the LDC effect on student outcomes are in the negative direction, but are not statistically significant for either model. In other words, neither analysis provided sufficient evidence to conclude that students taught by LDC teachers performed at levels different than their matched peers in the comparison group. The effects of the covariates on student performance were similar in direction to those in the Cohort 1 middle school model, but in this analysis the race/ethnicity and poverty coefficients were not significant, and the English Language Learner coefficient was significant. The effect for grade level was not large enough to meet our criteria for inclusion in the model presented below.

Table 7.8

Cohort 2 LDC Elementary School Teacher Effect Estimates on 2017-2018 NYS ELA Performance, Dosage-Independent Model

Variables	Dosage Dependent model coefficient (*SD*)	Dosage independent model coefficient (*SD*)
Level 1 - LDC teacher treatment	-0.048 (0.066)	-0.003 (0.034)
Level 2 - Student characteristics		
Hispanic	-0.077 (0.073)	-0.076 (0.073)
Black	-0.110 (0.074)	-0.110 (0.074)
Asian	0.015 (0.094)	0.015 (0.094)
Other	-0.028 (0.121)	-0.029 (0.121)
Poverty	-0.056 (0.039)	-0.056 (0.039)
Female	0.079 (0.025) *	0.079 (0.025) *
English Language Learner	-0.160 (0.040) *	-0.161 (0.040) *
Special education	-0.154 (0.036) *	-0.154 (0.036) *
% teachers average years of experience	0.001 (0.004)	0.001 (0.004)
Baseline peer ELA Z score	0.100 (0.039) *	0.099 (0.039) *
Baseline year mathematics Z score	0.235 (0.022) *	0.234 (0.022) *
Baseline year ELA Z score	0.593 (0.022) *	0.593 (0.022) *

Note. Based on the dosage-dependent model, the average treated student received a 0.642 treatment dosage. Because of this, using the dosage-dependent model we could estimate an average treatment on the treated (ATT) at (0.642 * -0.048) = -0.031.
*p = .05.

7.4 Outcome Analysis Results: Cohort 2 Middle School Sample

Similar analyses to those conducted for Cohort 1 middle schools were conducted for the Cohort 2 middle school sample. At the middle school level, the norm was student exposure to multiple teachers. As discussed in detail in Chapter 2, students could be exposed to anywhere between zero and twelve different LDC teachers. Using a MMMC design, each observation at Level 1 represented one student, which was linked to the ELA, social studies/history and science teachers that student was exposed to during the year. Weights across teachers for each student summed to a unity (1).

In Table 7.9 we present results of models that are both dosage dependent and dosage independent. Dosage dependent model results indicate an LDC effect in a positive direction that approached but did not obtain statistical significance on the student outcome when the p-value is set at 0.05. The dosage independent model was also in the positive direction and did not yield a statistically significant LDC effect. Once again, covariates were in the expected

direction, with in this case, gender, English Language Learner status, special education status being significant predictors of ELA achievement.

Table 7.9

Cohort 2 LDC Middle School Teacher Effect Estimates on 2017-2018 NYS ELA Performance, Dosage-Dependent and Dosage-Independent Models

Variables	Dosage-dependent model coefficient (*SD*)	Dosage-independent model coefficient (*SD*)
Level 2 - LDC teacher treatment	0.202 (0.108)	0.078 (0.051)
Level 1 - student characteristics		
Hispanic	0.107 (0.067)	0.107 (0.067)
Black	0.021 (0.066)	0.021 (0.066)
Asian	0.113 (0.074)	0.112 (0.074)
Other	-0.086 (0.116)	-0.088 (0.116)
Poverty	-0.056 (0.032)	-0.055 (0.032)
Female	0.130 (0.024)*	0.130 (0.024)*
English language learner	-0.195 (0.044)*	-0.196 (0.044)*
Special education	-0.167 (0.032)*	-0.167 (0.032)*
Grade 7	0.039 (0.043)	0.037 (0.043)
Grade 8	0.080 (0.039)*	0.081 (0.040)*
Teacher Experience	0.003 (0.004)	0.003 (0.004)
Baseline Peer ELA Z score	0.092 (0.037)*	0.096 (0.037)*
Baseline year mathematics Z score	0.206 (0.020)*	0.206 (0.019)*
Baseline year ELA Z score	0.653 (0.021)*	0.653 (0.021)*

Note. For the dosage dependent model, since the average treatment student received a 0.400 treatment dosage we could estimate an average treatment on the treated (ATET) at 0.40 * 0.202 = 0.081.
*p = .05.

7.5 Summary and Interpretation of Results

Here we summarize the quasi-experimental results and provide a lens by which the reader can contextualize the magnitude of the results. In Figures 7.1 and 7.2, we present the dosage-dependent effects for each of the three analyses. Figure 7.1 depicts the estimated impacts of LDC in the three samples on students exposed to LDC teachers in all three major content areas: ELA, social studies/history, and science. The effect sizes for these estimates can be best understood as the estimated impact of LDC under ideal conditions. Figure 7.2 depicts the estimated impact of LDC in the three samples on the average observed student, who had

considerably less exposure to LDC teachers in her core content classes, particularly in the middle school context.

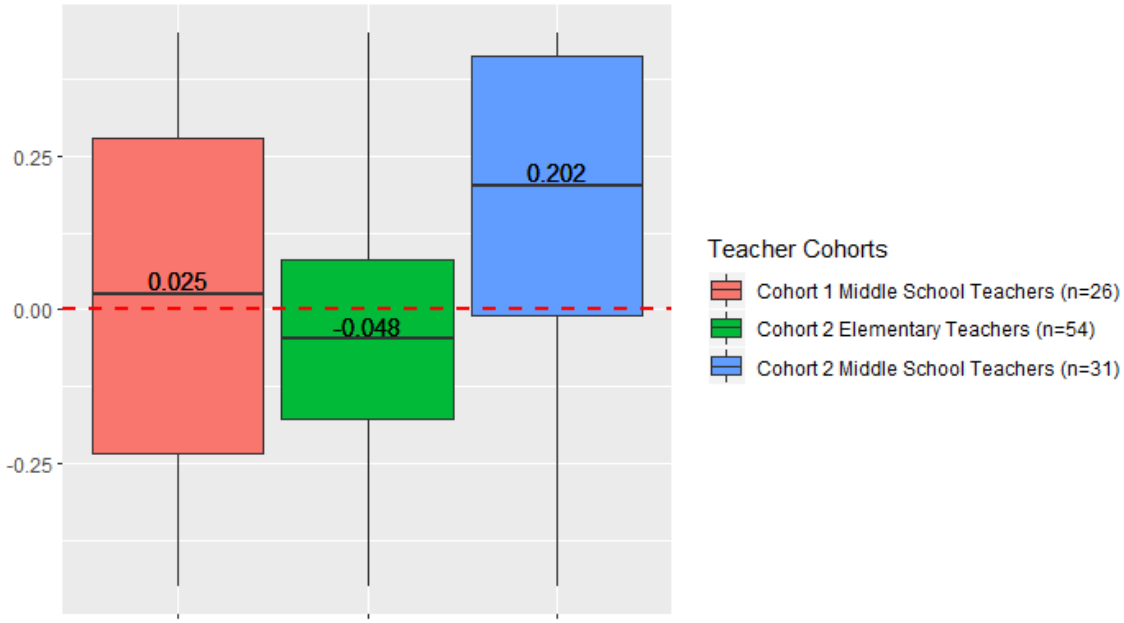

Figure 7.1. Treatment Effect on 2017-2018 New York State Assessment ELA Scores with 95% Confidence Interval for Students with Full LDC Dosage, by Cohort

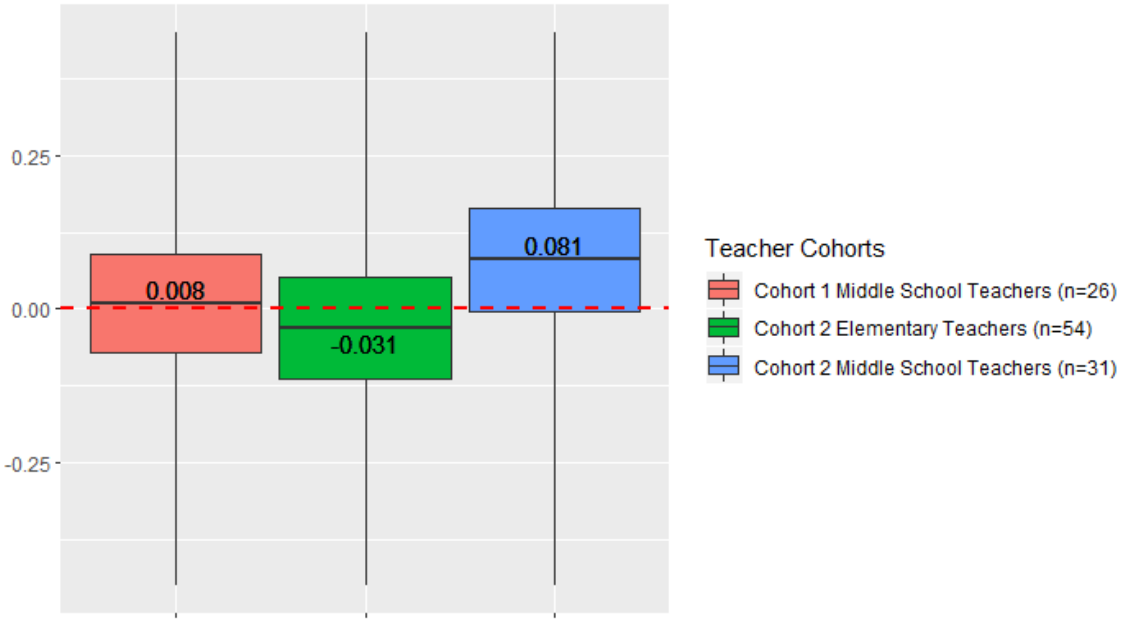

Figure 7.2. Treatment Effect on 2017-2018 New York State Assessment ELA Scores with 95% Confidence Interval for Students with Average LDC Dosage, by Cohort

As can be seen in the figures, the confidence intervals all cross the zero line, and therefore the estimates are not statistically significant at the 95 percent level. The lower bound of the confidence intervals around the estimates for the impact of Cohort 2 middle school teachers is, however, just below zero, suggesting that the estimates were not far off from being statistically significant at the 95 percent level.

It is important to note that results in this report are exploratory. The evaluation's main confirmatory research questions focus on teachers in their second year of implementation, pooling teachers and students from both cohorts. Confirmatory results will depend partially on New York State outcome scores in spring of 2019. Future confirmatory analyses will shed more light on the impact of LDC in New York City schools.

8.0 Summary of Findings

This annual report examines LDC following two years of implementation in Cohort 1 schools and one year of implementation in Cohort 2 schools in New York City Department of Education. We summarize these results organized by the three categories of evaluation questions we listed in Chapter 1 of this report.

8.1 Program Characteristics and Implementation

Consistent with prior year results, participants reported overwhelmingly positive attitudes toward LDC and its implementation at their schools. Teachers generally appreciated the opportunity to collaborate with colleagues, and nearly uniformly praised their LDC coaches. Prior to 2017-2018 implementation, LDC made further refinements to the content, sequencing, and delivery of CoreTools' instructional modules with the intent of streamlining the learning process for PLC members; this effort seems to have been successful as open-ended responses in our current survey did not reference instructional content as a problem.

In 2017-2018, local PLC leadership was assigned to a Teacher Leader rather than a Project Liaison. The role was strengthened by providing a stipend to the individual, and principals and assistant principals were no longer permitted to play the role. Again, these program changes seem to have been effective. PLC members overwhelmingly reported that their teacher leaders were supportive, knowledgeable, and helpful. Teacher leaders themselves also 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.

Multiple sources of evidence suggest that implementation was largely faithful to the intended structure of LDC. Most PLCs met at least every other week as they were expected to do. Coaches provided feedback through multiple mechanisms, and PLC members reported appreciating this feedback. Analysis of program data suggest that nearly all participants were engaging with the module building platform, although that engagement did vary greatly across individuals. Module analysis suggests that the materials adapted and created by PLC members varied in levels of completion, however, and based on presence of uploaded student work, a large proportion of participants did not end up implementing their modules in the classroom.

Encouraging developments were the increase in average quality of modules based on our exploratory analysis of modules by Cohort 1 teachers who completed modules in both years, and an increase in the number of modules teachers completed in CoreTools. The sample size for the growth analysis was, however, small, and we anticipate that with lower attrition in Cohort 2, we will be able to learn more about change in module quality within teachers over time.

8.2 Contextual Factors and Implementation

As noted above, coaches and Teacher Leaders were almost universally praised by teachers participating in LDC. Teachers also generally reported that their school administrators were supportive of the program, although administrators' level of participation in PLC meetings and observation of LDC instruction varied greatly across the sample, with most schools not meeting thresholds on key fidelity indicators. Survey respondents were less confident that district-level administrators were knowledgeable about and supportive of the LDC program in their schools.

As in prior years, adequate time was a frequently cited concern, with some respondents hoping for more collaborative time, more prep time, and/or time before the start of the year. Technology also remained a problem for some participants. Some respondents were frustrated with technical problems that marred the experience of zoom meetings, and some respondents simply would have preferred in-person rather than digital meetings with coaches. On a positive note, respondents seemed to report less difficulty with the CoreTools platform than in prior years, which may relate to both increased skills on the part of Cohort 1 participants, and refinements made by LDC to the platform.

8.3 Program Impacts

Based on survey results, LDC was perceived to have positive impacts on a range of both teacher practices and student skills. Teachers in general felt that LDC had improved their instructional planning and pedagogical skillsets and was also helping to promote collaboration between teachers. Module analysis suggests that overall mean module quality was higher in 2017-2018 than 2016-2017. An exploratory look at modules created by LDC teachers who participated in both year 1 and year 2 also suggests improvement of quality over time.

Sufficient sample size was available to conduct quasi-experimental tests of the impact of LDC on students taught by Cohort 1 returning middle school teachers, and by Cohort 2 elementary and middle school students. No statistically significant effects were found for any of the three analyses, although the effect for Cohort 2 middle school teachers was positive and approaching significance.

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Appendix A:
Teacher Survey and Responses

2017-2018
LDC Teacher Survey

1 LDC Participation

T1. Please select your school from the drop down box.
Teachers are skipped to T3 if they teach in an elementary school.

T2a. In the current school year (2017-18), how many classes did you teach?

☐ classes n = 140, Mean = 4.64, Range: 1-20

T2b. In how many of these classes did you use LDC modules and/or mini-tasks?

☐ classes n = 140, Mean = 2.87, Range: 0-13

T2c. In what content areas did you use LDC modules and/or mini-tasks?

_____

T2d. In what grades did you use LDC modules and/or mini-tasks?

_____

T3. Prior to the current school year (2017-18), did you have any experience with LDC?

(n = 231)

☐ Yes — 52 teachers (22.5%)

☐ No ↓ Skip to T5a — 179 teachers (77.5%)

T4. How many of the following did you teach prior to the current school year (2017-18)?

☐	LDC modules	n = 52, Mean = 2.40, Range: 0-5
☐	LDC mini-tasks, outside of modules	n = 52, Mean = 3.60, Range: 0-20

2 Professional Learning Community and Teacher Collaboration

T5a. Did you participate this year in a Professional Learning Community (PLC) at least partly focused on implementing LDC in your school?

(n = 203)

☐	Yes	Skip to T6	186 teachers (91.6%)
☐	No		17 teachers (8.4%)

T5b. Did you use any LDC tools in your instructional planning or classroom instruction this year?

(n = 17)

☐	Yes	Skip to 5d	15 teachers (88.2%)
☐	No		2 teachers (11.8%)

T5c. Why did you choose not to use any LDC tools in your instructional planning or classroom instruction this year?

[Survey ends here for respondents answering question T5c]

T5d. What LDC tools did you use during the current school year? Select all that apply.

	(n = 15)
☐ CoreTools online platform to access existing modules or mini-tasks	11 teachers (73.3%)
☐ CoreTools online platform to design modules or mini-tasks	9 teachers (60.0%)
☐ LDC online courses	4 teachers (26.7%)
☐ Modules or mini-tasks given to me by other teachers in my school	6 teachers (40.0%)
☐ Other (please specify) _____	2 teachers (13.3%)

[Survey ends here for respondents answering question T5d]

T6. About how often did your LDC PLC meet?

		(n = 186)
☐ Less than once a month		1 teacher (0.5%)
☐ Once a month		28 teachers (15.1%)
☐ Every other week		56 teachers (30.1%)
☐ Once a week	Skip to T8	94 teachers (50.5%)
☐ Twice a week or more often	Skip to T8	7 teachers (3.8%)

T7. What were the primary barriers preventing your LDC PLC from meeting weekly? Select all that apply.

	(n = 85)
☐ PLC time was not protected.	12 teachers (14.1%)
☐ PLC members had limited interest in attending meetings.	2 teachers (2.4%)
☐ School administrator did not make it a priority.	6 teachers (7.1%)
☐ Teacher Leader did not provide sufficient organizational support.	1 teacher (1.2%)
☐ Not enough teachers participated.	3 teachers (3.5%)
☐ PLC members had other priorities that compete with LDC participation.	52 teachers (61.2%)
☐ Other (please specify) _____	26 teachers (30.6%)

T8. About how often did you have informal discussions (as opposed to scheduled meetings) about LDC with teachers in your LDC PLC?

(n = 213)

☐ Less than once a month	30 teachers (14.1%)
☐ Once a month	39 teachers (18.3%)
☐ Every other week	38 teachers (17.8%)
☐ Once a week	64 teachers (30.0%)
☐ Twice a week or more	42 teachers (19.7%)

T9. On average, how long did your school's LDC PLC meetings typically last?

(n = 213)

☐ Less than 45 minutes	42 teachers (19.7%)
☐ 45 to 59 minutes	124 teachers (58.2%)
☐ 60 to 74 minutes	41 teachers (19.2%)
☐ 75 minutes or more	6 teachers (2.8%)

3 Teacher Training and Support

T10. How effective was your LDC PLC in the following areas?

	Not effective	A little effective	Moderately effective	Very effective
Creating an environment in which teachers were comfortable working together (n = 213)	1 (0.5%)	13 (6.1%)	83 (39.0%)	116 (54.5%)
Fostering an environment where teachers shared their instructional plans with colleagues (n = 213)	1 (0.5%)	17 (8.0%)	79 (37.1%)	116 (54.5%)
Allowing space to share student work (n = 213)	4 (1.9%)	17 (8.0%)	89 (41.8%)	103 (48.4%)
Helping teachers to improve their LDC instructional plans (n = 213)	1 (0.5%)	23 (10.8%)	91 (42.7%)	98 (46.0%)

T11. How would you rate each of the following aspects of the online course material (in the Learn tab in LDC CoreTools) that your coach used or directed you to use?

	Poor	Fair	Good	Excellent
Clarity of information presented (n = 213)	7 (3.3%)	34 (16.0%)	106 (49.8%)	66 (31.0%)
Relevance of information presented (n = 213)	3 (1.4%)	31 (14.6%)	118 (55.4%)	61 (28.6%)
Ease of use (n = 213)	16 (7.5%)	48 (22.5%)	101 (47.4%)	48 (22.5%)
Usefulness of resource documents (e.g., LDC Pitfall Checklist, CCSS Mental Markers, etc.) (n = 213)	7 (3.3%)	39 (18.3%)	103 (48.4%)	64 (30.0%)
Usefulness of videos (n = 213)	12 (5.6%)	47 (22.1%)	110 (51.6%)	44 (20.7%)
Degree to which course material helped teachers to create and/or adapt LDC modules (n = 213)	8 (3.8%)	40 (18.8%)	108 (50.7%)	57 (26.8%)
Opportunity to extend learning when needed or desired (n = 213)	8 (3.8%)	29 (13.6%)	111 (52.1%)	65 (30.5%)

T12a. Overall, were you able to get the feedback and support you needed from your LDC coach (through written feedback in LDC CoreTools, or coaching and modeling in your LDC PLCs) to plan, teach, reflect on, and revise LDC modules)?

(n = 212)

☐ Yes 209 teachers (98.6%)

☐ No 3 teachers (1.4%)

T12b. Did your LDC coach provide written feedback on your module(s) in LDC CoreTools in a timely manner?

(n = 212)

☐ Yes 210 teachers (99.1%)

☐ No 2 teachers (0.9%)

T13. Outside of the PLC meetings with your LDC coach, please indicate whether you used each of the following types of coach support, and how helpful you found these types of support.

	Did not use	Used			
		Not helpful	A little helpful	Moderately helpful	Very helpful
Written feedback in LDC CoreTools from your LDC coach (in the comments areas and/or via the teacher work rubric) (n = 212)	16 (7.5%)	1 (0.5%)	27 (12.7%)	76 (35.8%)	92 (43.4%)
One-on-one Zoom video conference and/or call with your LDC coach (n = 212)	24 (11.3%)	2 (0.9%)	22 (10.4%)	64 (30.2%)	100 (47.2%)
Email or phone communication with your LDC coach (n = 212)	28 (13.2%)	1 (0.5%)	21 (9.9%)	72 (34.0%)	90 (42.5%)
Other (n = 212) Please specify:_____	133 (62.7%)	2 (0.9%)	9 (4.2%)	23 (10.8%)	45 (21.2%)

4 Module Creation

T14. During the current school year (2017-18), how many LDC modules did you individually or collaboratively adapt from existing modules (e.g., modules you created in a prior year and/or modules found in the LDC Library in CoreTools)?

☐ Adapted modules n = 184, Mean = 2.08, Range: 0-10

T15. During the current school year (2017-18), how many LDC modules did you create, either individually or with colleague(s)? Only include modules built from scratch, not those adapted from existing modules in the LDC library.

☐ New modules n = 184, Mean = 1.39, Range: 0-20

T16. How did members of your PLC collaborate to create LDC modules? Check all that apply.

(n = 234)

☐ Modules were created by individual teachers.	112 teachers (47.9%)
☐ Modules were created by teams of two or more teachers.	145 teachers (62.0%)
☐ Modules were created by the PLC as a whole.	42 teachers (17.9%)
☐ Other (please specify) _____	13 teachers (5.6%)

T17. Please indicate to what extent you were able to do each of the following when creating LDC modules.

	Not at all	A little bit	A moderate extent	A great extent
Select focus standards for a writing assignment (n = 211)	1 (0.5%)	15 (7.1%)	75 (35.5%)	120 (56.9%)
Create a standards-driven writing assignment (n = 211)	1 (0.5%)	21 (10.0%)	75 (35.5%)	114 (54.0%)
Select high quality, complex texts and other materials to engage students in deeper learning (n = 211)	4 (1.9%)	27 (12.8%)	83 (39.3%)	97 (46.0%)
Identify the skills students need to develop to complete a writing assignment (n = 211)	2 (0.9%)	22 (10.4%)	88 (41.7%)	99 (46.9%)
Create daily lessons to teach the skills a student needs to complete a writing assignment (n = 211)	10 (4.7%)	34 (16.1%)	88 (41.7%)	79 (37.4%)
Differentiate instruction by incorporating multiple ways of thinking, various levels of complexity, and multiple modalities (n = 211)	12 (5.7%)	38 (18.0%)	88 (41.7%)	73 (34.6%)
Plan for a variety of methods to assess student progress (e.g., rubrics and/or mini-task scoring guides) (n = 211)	6 (2.8%)	28 (13.3%)	102 (48.3%)	75 (35.5%)
Assess the quality of writing assignments and/or instructional plans using Peer Review/Curriculum Alignment Rubric (e.g. Task Pitfalls Checklist, rubric indicators) (n = 211)	5 (2.4%)	33 (15.6%)	92 (43.6%)	81 (38.4%)
Make a writing assignment relevant and engaging for students (n = 211)	6 (2.8%)	20 (9.5%)	91 (43.1%)	94 (44.5%)

5 Classroom Implementation

T18. How many total LDC modules did you teach during the current school year (2017-18)?

☐ Modules n = 211, Mean = 2.48, Range: 0-20

T19. Outside of modules, approximately how many individual LDC mini-tasks did you teach during the current school year (2017-18)?

☐ Mini-tasks n = 211, Mean = 3.65, Range: 0-50

T20. Please indicate to what extent you were able to do each of the following activities when teaching LDC modules.

	Not at all	A little bit	A moderate extent	A great extent
Engage students in understanding the assignment and its rubric (n = 211)	8 (3.8%)	19 (9.0%)	97 (46.0%)	87 (41.2%)
Engage students in accessing complex text for the purpose of the assignment (n = 211)	8 (3.8%)	21 (10.0%)	98 (46.4%)	84 (39.8%)
Systematically collect information about students' progress (n = 211)	10 (4.7%)	30 (14.2%)	93 (44.1%)	78 (37.0%)
Provide feedback to students using assignment rubrics (n = 211)	13 (6.2%)	22 (10.4%)	90 (42.7%)	86 (40.8%)
Locate evidence of standards in final student work on the writing assignment (n = 211)	7 (3.3%)	19 (9.0%)	92 (43.6%)	93 (44.1%)
Use evidence of student progress on standards to modify subsequent instruction (n = 211)	9 (4.3%)	27 (12.8%)	93 (44.1%)	82 (38.9%)

T21. Toward the beginning of the school year, did you "find and teach" a module from CoreTools?

(n = 211)

- ☐ Yes — 130 teachers (61.6%)
- ☐ No — Skip to T24 — 81 teachers (38.4%)

T22. What was the name of the Find and Teach module?

_____

T23. Did you make any adjustments to the Find and Teach module?

(n = 130)

- ☐ Yes — 100 teachers (76.9%)
- ☐ No — 30 teachers (23.1%)

T24. What module did you adapt, refine, and/or develop most during the current school year (2017-18)? This module is typically one you worked on *after* the Find and Teach module.

_____

T25. Which of these statements best describes how you created the module named in the previous question?

(n = 210)

- ☐ I created a module from a template in CoreTools. — 84 teachers (40.0%)
- ☐ I found and adjusted another teacher's module from the LDC Library in CoreTools. — 126 teachers (60.0%)

T26. Did you teach this module in your classroom?

(n = 210)

- ☐ Yes, I have already taught this module this year. — 185 teachers (88.1%)
- ☐ No, but I plan to teach this module before the end of the 2017-18 school year. — 9 teachers (4.3%)
- ☐ No, but I plan to teach this module during next school year. — 13 teachers (6.2%)
- ☐ No. I do not currently have plans to teach this module in my classroom. — 3 teachers (1.4%)

6 Module Peer Review

T27. Did you attend a Peer Review/Curriculum Alignment Workshop this school year? (Y/N)

(n = 209)

☐ Yes	74 teachers (35.4%)
☐ No	135 teachers (64.6%)

T28. How many modules did you submit online for LDC National Peer Review during the current school year (2017-18)?

☐ Modules If none, ↓ skip to T29 n = 210, Mean = 0.59, Range: 0-5

T29. How helpful did you find the National Peer Review process in improving the quality of your module?

(n = 79)

☐ Not helpful	8 teachers (10.1%)
☐ A little helpful	23 teachers (29.1%)
☐ Moderately helpful	19 teachers (24.1%)
☐ Very helpful	29 teachers (36.7%)

7 Impact on Teacher Practice and Learning

T30. Between the beginning and end of this year's work with LDC, please indicate how much your skills have *improved* in the following areas:

	Not at all	A little	Moderately	A great deal
Selecting focus standards for a writing assignment (n = 210)	12 (5.7%)	22 (10.5%)	93 (44.3%)	83 (39.5%)
Creating standards-driven writing assignments (n = 210)	11 (5.2%)	28 (13.3%)	88 (41.9%)	83 (39.5%)
Identifying the skills students need to develop to complete a writing assignment (n = 210)	12 (5.7%)	27 (12.9%)	97 (46.2%)	74 (35.2%)
Creating daily lessons to teach the skills students need to complete a writing assignment (n = 210)	15 (7.1%)	40 (19.0%)	91 (43.3%)	64 (30.5%)
Systematically collecting information on students' progress (n = 210)	17 (8.1%)	40 (19.0%)	94 (44.8%)	59 (28.1%)
Identifying patterns of student understandings or misconceptions (n = 210)	14 (6.7%)	28 (13.3%)	105 (50.0%)	63 (30.0%)
Using evidence of student progress on standards to modify subsequent instruction (n = 210)	15 (7.1%)	28 (13.3%)	96 (45.7%)	71 (33.8%)

T31. Please indicate the degree to which you agree or disagree with the statements below.

	Strongly disagree	Disagree	Agree	Strongly agree
Participating in LDC raised my expectations for students' writing. (n = 210)	7 (3.3%)	33 (15.7%)	113 (53.8%)	57 (27.1%)
Using LDC modules became an important part of my instructional practice. (n = 210)	12 (5.7%)	49 (23.3%)	114 (54.3%)	35 (16.7%)
Implementing LDC helped me incorporate my state's College- and Career-Ready Standards into my instruction. (n = 210)	11 (5.2%)	43 (20.5%)	115 (54.8%)	41 (19.5%)
LDC helped me incorporate writing assignments into my existing curriculum. (n = 210)	10 (4.8%)	29 (13.8%)	119 (56.7%)	52 (24.8%)
I am more likely to collaborate with other teachers on designing instruction after participating in our LDC Professional Learning Community. (n = 210)	10 (4.8%)	23 (11.0%)	125 (59.5%)	52 (24.8%)
LDC helped me improve on my teacher evaluation ratings. (n = 210)	16 (7.6%)	68 (32.4%)	95 (45.2%)	31 (14.8%)
Participating in LDC helped me develop working relationships with teachers in different grades and/or subjects. (n = 210)	13 (6.2%)	31 (14.8%)	122 (58.1%)	44 (21.0%)
I shared my LDC work with colleagues outside of the LDC PLC. (n = 210)	16 (7.6%)	67 (31.9%)	86 (41.0%)	41 (19.5%)

8 Impact on Student Learning

T32. Please indicate to what extent LDC had a positive effect on students in the following areas.

	Not at all	A little	Moderately	A great deal
Reading skills (n = 210)	17 (8.1%)	40 (19.0%)	109 (51.9%)	44 (21.0%)
Content knowledge (n = 210)	10 (4.8%)	34 (16.2%)	109 (51.9%)	57 (27.1%)
Ability to complete writing assignments (n = 210)	11 (5.2%)	38 (18.1%)	97 (46.2%)	64 (30.5%)
Quality of students' writing (n = 210)	12 (5.7%)	41 (19.5%)	101 (48.1%)	56 (26.7%)
College and career ready skills (n = 210)	23 (11.0%)	46 (21.9%)	101 (48.1%)	40 (19.0%)
Capacity to analyze and understand the components of a writing assignment (n = 210)	12 (5.7%)	38 (18.1%)	101 (48.1%)	59 (28.1%)
Speaking and listening skills (n = 210)	22 (10.5%)	46 (21.9%)	106 (50.5%)	36 (17.1%)
Overall literacy performance (n = 210)	10 (4.8%)	43 (20.5%)	107 (51.0%)	50 (23.8%)
Performance on assessments throughout the school year (n = 210)	15 (7.1%)	39 (18.6%)	111 (52.9%)	45 (21.4%)

9 Teacher Leader Support

The following question refers to the LDC project liaison in your school. This is the teacher leading your Professional Learning Community work.

T33. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
Our school's LDC teacher leader effectively supported our Professional Learning Community meetings. (n = 182)	3 (1.6%)	4 (2.2%)	80 (44.0%)	95 (52.2%)
When I had questions about LDC, I felt comfortable approaching our school's teacher leader. (n = 182)	3 (1.6%)	1 (0.5%)	81 (44.5%)	97 (53.3%)
Our teacher leader helped teachers align LDC to broader school instructional goals. (n = 182)	3 (1.6%)	10 (5.5%)	89 (48.9%)	80 (44.0%)
Our teacher leader offered useful feedback for the design and revision of LDC modules. (n = 182)	3 (1.6%)	12 (6.6%)	87 (47.8%)	80 (44.0%)
Our teacher leader was effective in inviting teachers to join the LDC initiative. (n = 182)	4 (2.2%)	3 (1.6%)	91 (50.0%)	84 (46.2%)

10 School Administrator Support

The following questions refer to the school administrator who oversees the LDC project at your school.

T34. What proportion of PLC meetings focused on LDC did your school administrator attend?

(n = 209)

- ☐ Less than one quarter of LDC PLCs — 91 teachers (43.5%)
- ☐ About one quarter of LDC PLCs — 46 teachers (22.0%)
- ☐ About one half of LDC PLCs — 30 teachers (14.4%)
- ☐ About three quarters of LDC PLCs — 10 teachers (4.8%)
- ☐ More than three quarters of LDC PLCs — 32 teachers (15.3%)

T35. How many times did your school administrator observe you teach an LDC mini-task during the current school year (2017-18)?

(n = 209)

☐ 0 times	84 teachers (40.2%)
☐ 1 time	66 teachers (31.6%)
☐ 2 times	22 teachers (10.5%)
☐ 3 or more times	37 teachers (17.7%)

T36. Please indicate the degree to which you agree or disagree with the following statements.

My school administrator…	Strongly disagree	Disagree	Agree	Strongly agree
had a firm understanding of LDC. (n = 208)	12 (5.8%)	30 (14.4%)	133 (63.9%)	33 (15.9%)
Allocated resources such as teacher time, payment, administrator time, support staff, sub coverage, etc., to ensure the LDC team could meet. (n = 208)	13 (6.3%)	27 (13.0%)	124 (59.6%)	44 (21.2%)
encouraged teachers to participate in LDC. (n = 208)	9 (4.3%)	16 (7.7%)	124 (59.6%)	59 (28.4%)
expressed concerns that implementing LDC is taking time away from other instructional priorities. (n = 208)	27 (13.0%)	72 (34.6%)	77 (37.0%)	32 (15.4%)
communicated how using LDC's tools supported specific school initiatives and/or goals. (n = 208)	12 (5.8%)	32 (15.4%)	125 (60.1%)	39 (18.8%)
provided me with feedback about my LDC planning and/or instruction. (n = 208)	22 (10.6%)	57 (27.4%)	96 (46.2%)	33 (15.9%)
made formative assessment a priority at my school. (n = 208)	7 (3.4%)	32 (15.4%)	121 (58.2%)	48 (23.1%)
used LDC to implement standards-driven assignments within existing curriculum. (n = 208)	15 (7.2%)	46 (22.1%)	112 (53.8%)	35 (16.8%)

11 Teacher Leadership Role

T37. Please indicate the degree to which you agree or disagree with the following statements about your role in your school's LDC implementation.

	Strongly disagree	Disagree	Agree	Strongly agree
I was involved in setting instructional goals for the LDC work at my school. (n = 180)	11 (6.1%)	59 (32.8%)	83 (46.1%)	27 (15.0%)
I was involved in discussions about how to expand LDC implementation at my school in future years. (n = 180)	19 (10.6%)	62 (34.4%)	73 (40.6%)	26 (14.4%)
I had the opportunity to work with our LDC teacher leader and our administrator to help shape LDC implementation. (n = 180)	17 (9.4%)	50 (27.8%)	87 (48.3%)	26 (14.4%)
I am interested in learning more about how to lead LDC implementation at my school by facilitating with the virtual coach, providing feedback to my peers, etc. (n = 180)	17 (9.4%)	44 (24.4%)	91 (50.6%)	28 (15.6%)

12 Facilitators and Barriers

T38. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
My LDC PLC was given sufficient time to meet. (n = 207)	12 (5.8%)	41 (19.8%)	118 (57.0%)	36 (17.4%)
I felt adequately prepared to effectively implement LDC modules in my classroom. (n = 207)	13 (6.3%)	37 (17.9%)	121 (58.5%)	36 (17.4%)
It was challenging to find content-rich reading materials for the LDC modules I developed. (n = 207)	11 (5.3%)	71 (34.3%)	98 (47.3%)	27 (13.0%)
My school had adequate technology to support teachers' use of LDC. (n = 207)	8 (3.9%)	30 (14.5%)	119 (57.5%)	50 (24.2%)
It was easy to find and adapt LDC mini-tasks for use in my classroom. (n = 207)	8 (3.9%)	28 (13.5%)	133 (64.3%)	38 (18.4%)

13 Areas for Improvement

There have been a number of supports for implementation of LDC in your school, including:

- CoreTools online platform
- LDC online courses in the "Learn" section of CoreTools
- Virtual coaching
  - Zoom meetings, written feedback on teacher work in LDC CoreTools, emails, etc.
- In-person coaching
  - Summer training, in-person support visits from LDC and District Lead, in-person professional development opportunities, etc.

T39. What supports did you find the most useful and why?

T40. What supports were not helpful and why?

T41. In what ways could LDC implementation be improved in your school in the future?

Appendix B:
Teacher Leader Survey and Responses

2017-2018
LDC Teacher Leader Survey

1 LDC Participation

TL1. Prior to the current school year (2017-18), did you have any experience with LDC?

(n = 43)

☐ Yes		17 teacher leaders (39.5%)
☐ No	Skip toTL3	26 teacher leaders (60.5%)

TL2. How many of the following did you teach prior to the current school year (2017-18)?

☐ LDC modules	n = 17, Mean = 1.94, Range: 0-5
☐ LDC mini-tasks, outside of modules	n = 17, Mean = 2.00, Range: 0-9

2 Professional Learning Community and Teacher Collaboration

The following questions involve the LDC Professional Learning Community (PLC) that you are leading.

TL3. About how often did your LDC PLC meet?

(n = 43)

☐ Less than once a month		0 teacher leaders (0.0%)
☐ Once a month		6 teacher leaders (14.0%)
☐ Every other week		18 teacher leaders (41.9%)
☐ Once a week	Skip to TL5	17 teacher leaders (39.5%)
☐ Twice a week or more often	Skip to TL5	2 teacher leaders (4.7%)

TL4. What were the primary barriers preventing your LDC PLC from meeting weekly? Select all that apply.

(n = 24)

☐ PLC time was not protected.	6 teacher leaders (25.0%)
☐ PLC members had limited interest in attending meetings.	5 teacher leaders (20.8%)
☐ School administrator did not make it a priority.	4 teacher leaders (16.7%)
☐ I was unable to provide sufficient organizational support.	3 teacher leaders (12.5%)
☐ Not enough teachers participated.	3 teacher leaders (12.5%)
☐ PLC members had other priorities that competed with LDC participation.	17 teacher leaders (70.8%)
☐ Other (please specify) _____	0 teacher leaders (0.0%)

TL5. About how often did you have informal discussions (as opposed to scheduled meetings) about LDC with teachers in your LDC PLC?

(n = 43)

☐ Less than once a month	3 teacher leaders (7.0%)
☐ Once a month	6 teacher leaders (14.0%)
☐ Every other week	8 teacher leaders (18.6%)
☐ Once a week	19 teacher leaders (44.2%)
☐ Twice a week or more	7 teacher leaders (16.3%)

TL6. On average how long did your school's LDC PLC meetings typically last?

(n = 43)

☐ Less than 45 minutes	8 teacher leaders (18.6%)
☐ 45 to 59 minutes	24 teacher leaders (55.8%)
☐ 60 to 74 minutes	9 teacher leaders (20.9%)
☐ 75 minutes or more	2 teacher leaders (4.7%)

3 Teacher Training and Support

TL7. How effective was your LDC PLC in the following areas?

	Not effective	A little effective	Moderately effective	Very effective
Creating an environment in which teachers are comfortable working together (n = 43)	1 (2.3%)	2 (4.7%)	17 (39.5%)	23 (53.5%)
Fostering an environment where teachers share their instructional plans with colleagues (n = 43)	0 (0.0%)	4 (9.3%)	20 (46.5%)	19 (44.2%)
Allowing space to share student work (n = 43)	0 (0.0%)	6 (14.0%)	19 (44.2%)	18 (41.9%)
Helping teachers learn to improve their LDC instructional plans. (n = 43)	1 (2.3%)	8 (18.6%)	17 (39.5%)	17 (39.5%)

TL8. How would you rate each of the following aspects of the online course material (in the Learn tab in LDC CoreTools) that your coach used or directed you to use?

	Poor	Fair	Good	Excellent
Clarity of information presented (n = 43)	0 (0.0%)	8 (18.6%)	20 (46.5%)	15 (34.9%)
Relevance of information presented (n = 43)	0 (0.0%)	7 (16.3%)	21 (48.8%)	15 (34.9%)
Ease of use (n = 43)	3 (7.0%)	7 (16.3%)	21 (48.8%)	12 (27.9%)
Usefulness of resource documents (e.g., LDC Pitfall Checklist, CCSS Mental Markers, etc.) (n = 43)	0 (0.0%)	9 (20.9%)	20 (46.5%)	14 (32.6%)
Usefulness of videos (n = 43)	3 (7.0%)	6 (14.0%)	23 (53.5%)	11 (25.6%)
Degree to which course material helped teachers to create and/or adapt LDC modules (n = 43)	1 (2.3%)	7 (16.3%)	18 (41.9%)	17 (39.5%)
Opportunity to extend learning when needed or desired (n = 43)	0 (0.0%)	7 (16.3%)	19 (44.2%)	17 (39.5%)

TL9a. Overall, were you able to get the feedback and support you needed from your LDC coach (through written feedback in LDC CoreTools, or coaching and modeling in your LDC PLCs) to plan, teach, reflect on, and revise LDC modules?

(n = 43)

☐ Yes 43 teacher leaders (100%)

☐ No 0 teacher leaders (0.0%)

TL9b. Did your LDC coach provide written feedback on your module(s) in LDC CoreTools in a timely manner?

(n = 43)

☐ Yes 43 teacher leaders (100.0%)

☐ No 0 teacher leaders (0.0%)

TL10. Outside of the PLC meetings with your LDC coach, please indicate whether you used each of the following types of coach support, and how helpful you found these types of support.

	Did not use	Used			
		Not helpful	A little helpful	Moderately helpful	Very helpful
Written feedback in LDC CoreTools from your LDC coach (in the comments areas and/or via the teacher work rubric) (n = 43)	2 (4.7%)	0 (0.0%)	5 (11.6%)	13 (30.2%)	23 (53.5%)
One-on-one Zoom video conference and/or call with your LDC coach (n = 43)	3 (7.0%)	0 (0.0%)	2 (4.7%)	10 (23.3%)	28 (65.1%)
Email or phone communication with your LDC coach (n = 43)	2 (4.7%)	0 (0.0%)	3 (7.0%)	12 (27.9%)	26 (60.5%)
Other (please specify) (n = 43)	24 (55.8%)	0 (0.0%)	0 (0.0%)	5 (11.6%)	14 (32.6%)

TL11. How many in-person and/or online LDC professional development offerings for school administrators and teacher leaders did you attend during the current school (e.g., Summer in-person launch days, Quarterly in-person teacher leader meetings, LDC monthly virtual coach meetings)?

☐ Professional development offerings n = 43, Mean = 3.98, Range: 0-15

4 Support to Teacher Leader from LDC Coach

TL12. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree	N/A
I was able to reach my LDC coach if I had any questions about LDC. (n = 43)	0 (0.0%)	0 (0.0%)	5 (11.6%)	38 (88.4%)	0 (0.0%)
LDC provided adequate technical support for issues with the CoreTools online platform. (n = 43)	0 (0.0%)	2 (4.7%)	23 (53.5%)	18 (41.9%)	0 (0.0%)
LDC offered sufficient professional development opportunities for me to lead the initiative in my school. (n = 43)	0 (0.0%)	0 (0.0%)	22 (51.2%)	21 (48.8%)	0 (0.0%)
LDC coaches were able to connect me with additional resources when needed. (n = 43)	0 (0.0%)	0 (0.0%)	11 (25.6%)	31 (72.1%)	1 (2.3%)
It was challenging to coordinate with our LDC coach on how to structure Professional Learning Community time. (n = 43)	14 (32.6%)	11 (25.6%)	8 (18.6%)	8 (18.6%)	2 (4.7%)
When I reached out to our LDC coach, he or she responded quickly. (n = 43)	0 (0.0%)	0 (0.0%)	6 (14.0%)	36 (83.7%)	1 (2.3%)
Our LDC coach was easy to work with.(n = 43)	0 (0.0%)	0 (0.0%)	6 (14.0%)	36 (83.7%)	1 (2.3%)
Our LDC coach was knowledgeable and provided high quality guidance. (n = 43)	0 (0.0%)	1 (2.3%)	6 (14.0%)	35 (81.4%)	1 (2.3%)

5 Module Creation

TL13. During the current school year (2017-18), how many LDC modules did your PLC individually or collaboratively adapt from existing modules (e.g., modules created in a prior year and/or modules from the LDC Library in CoreTools)?

☐ Adapted modules n = 43, Mean = 3.19, Range: 0-15

TL14. During the current school year (2017-18), how many LDC modules did your PLC create (either individually or in a group)? Only include modules built from scratch, not those adapted from existing modules in the LDC library.

☐ New modules n = 43, Mean = 2.05, Range: 0-7

TL15. How did members of your PLC collaborate to create LDC modules? Check all that apply.

	(n = 43)
☐ Modules were created by individual teachers.	22 teacher leaders (51.2%)
☐ Modules were created by teams of two or more teachers.	31 teacher leaders (72.1%)
☐ Modules were created by the PLC as a whole.	9 teacher leaders (20.9%)
☐ Other (please specify) _____	2 teacher leaders (4.7%)

TL16. Please indicate to what extent you were able to do each of the following when creating LDC modules.

	Not at all	A little bit	To a moderate extent	To a great extent
Select focus standards for a writing assignment (n = 43)	1 (2.3%)	3 (7.0%)	9 (20.9%)	30 (69.8%)
Create a standards-driven writing assignment (n = 43)	1 (2.3%)	2 (4.7%)	10 (23.3%)	30 (69.8%)
Select high quality, complex texts and other materials to engage students in deeper learning (n = 43)	1 (2.3%)	3 (7.0%)	16 (37.2%)	23 (53.5%)
Identify the skills students need to develop to complete a writing assignment (n = 43)	1 (2.3%)	2 (4.7%)	17 (39.5%)	23 (53.5%)
Create daily lessons to teach the skills a student needs to complete a writing assignment (n = 43)	2 (4.7%)	4 (9.3%)	19 (44.2%)	18 (41.9%)
Differentiate instruction by incorporating multiple ways of thinking, various levels of complexity, and multiple modalities. (n = 43)	2 (4.7%)	5 (11.6%)	19 (44.2%)	17 (39.5%)
Plan for a variety of methods to assess student progress (e.g., rubrics and/or mini-task scoring guides) (n = 43)	1 (2.3%)	6 (14.0%)	19 (44.2%)	17 (39.5%)
Assess the quality of writing assignments and/or instructional plans using Peer Review/Curriculum Alignment Rubric (e.g. Task Pitfalls Checklist, rubric indicators) (n = 43)	1 (2.3%)	2 (4.7%)	18 (41.9%)	22 (51.2%)
Make a writing assignment relevant and engaging for students (n = 43)	1 (2.3%)	2 (4.7%)	19 (44.2%)	21 (48.8%)

6 Impact on Student Learning

TL17. Please indicate to what extent LDC had a positive effect on students in the following areas.

	Not at all	A little	Moderately	A great deal
Reading skills (n = 43)	2 (4.7%)	8 (18.6%)	22 (51.2%)	11 (25.6%)
Content knowledge (n = 43)	1 (2.3%)	9 (20.9%)	20 (46.5%)	13 (30.2%)
Ability to complete writing assignments (n = 43)	1 (2.3%)	5 (11.6%)	18 (41.9%)	19 (44.2%)
Quality of students' writing (n = 43)	1 (2.3%)	5 (11.6%)	17 (39.5%)	20 (46.5%)
College and career ready skills (n = 43)	3 (7.0%)	6 (14.0%)	21 (48.8%)	13 (30.2%)
Capacity to analyze and understand the components of a writing assignment (n = 43)	1 (2.3%)	7 (16.3%)	17 (39.5%)	18 (41.9%)
Speaking and listening skills (n = 43)	4 (9.3%)	8 (18.6%)	22 (51.2%)	9 (20.9%)
Overall literacy performance (n = 43)	2 (4.7%)	5 (11.6%)	24 (55.8%)	12 (27.9%)
Performance on assessments throughout the school year (n = 43)	2 (4.7%)	5 (11.6%)	23 (53.5%)	13 (30.2%)

7 School Administrator Support

The following questions refer to the school administrator who oversees the LDC project at your school.

TL18. What proportion of PLC meetings focused on LDC did your school administrator attend?
(n = 43)

- ☐ Less than one quarter of LDC PLCs — 19 teacher leaders (44.2%)
- ☐ About one quarter of LDC PLCs — 9 teacher leaders (20.9%)
- ☐ About one half of LDC PLCs — 10 teacher leaders (23.3%)
- ☐ About three quarters of LDC PLCs — 0 teacher leaders (0.0%)
- ☐ More than three quarters of LDC PLCs — 5 teacher leaders (11.6%)

TL19. Please indicate the degree to which you agree or disagree with the following statements.

My school administrator…	Strongly disagree	Disagree	Agree	Strongly agree
had a firm understanding of LDC. (n = 43)	1 (2.3%)	7 (16.3%)	27 (62.8%)	8 (18.6%)
allocated resources such as teacher time, payment, administrator time, support staff, sub coverage, etc., to ensure the LDC team could meet. (n = 43)	0 (0.0%)	8 (18.6%)	26 (60.5%)	9 (20.9%)
encouraged teachers to participate in LDC. (n = 43)	0 (0.0%)	4 (9.3%)	26 (60.5%)	13 (30.2%)
expressed concerns that implementing LDC is taking time away from other instructional priorities. (n = 43)	13 (30.2%)	12 (27.9%)	14 (32.6%)	4 (9.3%)
communicated how using LDC's tools supported specific school initiatives and/or goals. (n = 43)	1 (2.3%)	5 (11.6%)	30 (69.8%)	7 (16.3%)
provided me with feedback about my LDC planning and/or instruction. (n = 43)	2 (4.7%)	12 (27.9%)	25 (58.1%)	4 (9.3%)
made formative assessment a priority at my school. (n = 43)	0 (0.0%)	3 (7.0%)	30 (69.8%)	10 (23.3%)
used LDC to implement standards-driven assignments within existing curriculum. (n = 43)	1 (2.3%)	7 (16.3%)	25 (58.1%)	10 (23.3%)

8 Teacher Leader Leadership Role

TL20. Please indicate the degree to which you agree or disagree with the following statements about your role in leading your school's LDC implementation.

	Strongly disagree	Disagree	Agree	Strongly agree
I met regularly with my school administrator to make planning decisions around LDC. (n = 43)	4 (9.3%)	12 (27.9%)	17 (39.5%)	10 (23.3%)
I was involved in discussions about differentiating LDC implementation to meet teacher learning needs. (n = 43)	2 (4.7%)	6 (14.0%)	23 (53.5%)	12 (27.9%)
I was involved in discussions about how to expand LDC implementation at my school in future years. (n = 43)	1 (2.3%)	8 (18.6%)	23 (53.5%)	11 (25.6%)
My role as an LDC teacher leader allowed me to effectively advocate for additional resources on my campus. (n = 43)	1 (2.3%)	8 (18.6%)	26 (60.5%)	8 (18.6%)
I was involved in adjusting the problems of practice that my school targeted with the LDC work. (n = 43)	1 (2.3%)	4 (9.3%)	30 (69.8%)	8 (18.6%)
I met regularly with my LDC coach to manage the LDC work plan. (n = 43)	0 (0.0%)	4 (9.3%)	25 (58.1%)	14 (32.6%)
I feel that my position as an LDC teacher leader allowed me to build my capacity as an instructional leader among my colleagues. (n = 43)	0 (0.0%)	4 (9.3%)	24 (55.8%)	15 (34.9%)
I am confident that I can lead our LDC PLC in the future without the assistance of an LDC coach. (n = 43)	0 (0.0%)	13 (30.2%)	21 (48.8%)	9 (20.9%)

9 Alignment

TL21. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
Our school connected LDC implementation to our specific schoolwide goals. (n = 43)	1 (2.3%)	9 (20.9%)	23 (53.5%)	10 (23.3%)
LDC helped teachers create writing assignments to use within their current curricula. (n = 43)	0 (0.0%)	0 (0.0%)	31 (72.1%)	12 (27.9%)
LDC complemented other initiatives taking place in my school. (n = 43)	1 (2.3%)	3 (7.0%)	29 (67.4%)	10 (23.3%)
I view LDC as a strategy for implementing my state's College- and Career-Ready Standards. (n = 43)	0 (0.0%)	5 (11.6%)	27 (62.8%)	11 (25.6%)
The time spent implementing LDC interfered with other important initiatives at my school. (n = 43)	4 (9.3%)	10 (23.3%)	23 (53.5%)	6 (14.0%)
LDC helped prepare students in my school for current state assessments. (n = 43)	0 (0.0%)	7 (16.3%)	25 (58.1%)	11 (25.6%)
It was difficult for teachers to focus on LDC because of other competing priorities at the school. (n = 43)	3 (7.0%)	8 (18.6%)	19 (44.2%)	13 (30.2%)
Our instructional leaders are using LDC to implement standards-driven assignments within the existing curriculum. (n = 43)	0 (0.0%)	9 (20.9%)	26 (60.5%)	8 (18.6%)

10 Scale-up and Sustainability

TL22. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
I expect that most teachers participating in LDC this year will continue to do so next year. (n = 43)	1 (2.3%)	6 (14.0%)	28 (65.1%)	8 (18.6%)
Teachers at my school who were not part of the LDC PLC meetings used the LDC planning process and/or LDC CoreTools. (n = 43)	5 (11.6%)	23 (53.5%)	13 (30.2%)	2 (4.7%)
As a result of LDC, new collaborations across grades and/or subjects were created or are being launched at my school. (n = 43)	2 (4.7%)	11 (25.6%)	25 (58.1%)	5 (11.6%)
Teachers and administrators at my school are committed to sustaining the LDC initiative. (n = 43)	0 (0.0%)	11 (25.6%)	21 (48.8%)	11 (25.6%)
I expect our LDC PLC to increase in size next year. (n = 43)	1 (2.3%)	12 (27.9%)	19 (44.2%)	11 (25.6%)

11 District Support

TL23. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree	Don't know
District leaders supported the implementation of LDC. (n = 43)	0 (0.0%)	2 (4.7%)	14 (32.6%)	6 (14.0%)	21 (48.8%)
District leaders had a firm understanding of LDC. (n = 43)	0 (0.0%)	1 (2.3%)	12 (27.9%)	6 (14.0%)	24 (55.8%)
District leaders are interested in spreading the use of LDC to additional schools. (n = 43)	0 (0.0%)	2 (4.7%)	11 (25.6%)	4 (9.3%)	26 (60.5%)
District professional development efforts were aligned with the LDC initiative. (n = 43)	0 (0.0%)	1 (2.3%)	15 (34.9%)	6 (14.0%)	21 (48.8%)
District leaders visited my school to discuss the implementation of LDC. (n = 43)	4 (9.3%)	3 (7.0%)	13 (30.2%)	4 (9.3%)	19 (44.2%)

12 Areas for Improvement

There have been a number of supports for implementation of LDC in your school, including:

- CoreTools online platform
- LDC online courses in the "Learn" section of CoreTools
- Virtual coaching
  - Zoom meetings, written feedback on teacher work in LDC CoreTools, emails, etc.
- In-person coaching
  - Summer training, in-person support visits from LDC and District Lead, in-person professional development opportunities, etc.

TL24. What supports did you find the most useful and why?

TL25. What supports were not helpful and why?

TL26. In what ways could LDC implementation be improved in your school in the future?

Appendix C:
Administrator Survey and Responses

2017-2018
LDC School Administrator Survey

1 LDC Participation

A1. What is your role at the school?

(n = 17)

☐ Principal	11 admins (64.7%)
☐ Assistant Principal	6 admins (35.3%)
☐ Other (please specify) _____	0 admin (0.0%)

2 Professional Learning Community

A2. What proportion of LDC Professional Learning Community (PLC) meetings did you attend during the current school year?

(n = 17)

☐ Less than one quarter of LDC PLCs	7 admins (41.2%)
☐ About one quarter of LDC PLCs	5 admins (29.4%)
☐ About one half of LDC PLCs	2 admins (11.8%)
☐ About three quarters of LDC PLCs	2 admins (11.8%)
☐ More than three quarters of LDC PLCs	1 admin (5.9%)

3 Training and Support

A3. How many in-person and/or online LDC professional development offerings for school administrators and teacher leaders did you attend during the current school year (e.g.,

Summer launch meetings, quarterly in-person administrator meetings, monthly virtual LDC leadership meetings)?

☐ LDC Professional development offerings n = 16, Mean = 5.63, Range: 0-20

A4. Please indicate the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree	N/A
I was able to reach LDC staff when I had questions about LDC. (n = 16)	0 (0.0%)	0 (0.0%)	4 (25.0%)	11 (68.8%)	1 (6.3%)
My school has adequate technology to access LDC online resources. (n = 16)	0 (0.0%)	1 (6.3%)	5 (31.3%)	10 (62.5%)	0 (0.0%)
LDC offered sufficient professional development opportunities for LDC teacher leaders. (n = 16)	0 (0.0%)	0 (0.0%)	7 (43.8%)	9 (56.3%)	0 (0.0%)
LDC offered sufficient professional development opportunities for school administrators. (n = 16)	0 (0.0%)	0 (0.0%)	8 (50.0%)	8 (50.0%)	0 (0.0%)
LDC staff members were able to connect me with additional resources when needed. (n = 16)	0 (0.0%)	0 (0.0%)	7 (43.8%)	9 (56.3%)	0 (0.0%)

4 Classroom Observation

A5. On average, how many times during the school year did you observe each member of the LDC PLC teaching an LDC module?

(n = 16)

☐ 0 times — Skip to A7 — 0 admin (0.0%)

☐ 1 time — 4 admins (25.0%)

☐ 2 times — 4 admins (25.0%)

☐ 3 or more times — 8 admins (50.0%)

A6. On average, how effective were LDC modules in developing students' literacy skills?

(n = 16)

☐ Not effective	0 admin (0.0%)
☐ A little effective	2 admins (12.5%)
☐ Moderately effective	6 admins (37.5%)
☐ Very effective	8 admins (50.0%)

5 Impact on Teacher Practice

A7. Based on your oversight of the LDC program, please indicate on average how much the teaching practice of LDC PLC members improved in each of the following areas:

	Not at all	A little	Moderately	A great deal
Selecting a set of focus standards for a writing assignment (n = 16)	0 (0.0%)	1 (6.3%)	6 (37.5%)	9 (56.3%)
Creating standards-driven writing assignments (n = 16)	0 (0.0%)	1 (6.3%)	5 (31.3%)	10 (62.5%)
Identifying the skills students need to develop to complete a writing assignment (n = 16)	0 (0.0%)	1 (6.3%)	6 (37.5%)	9 (56.3%)
Creating daily lessons to teach each skill a student needs to complete a writing assignment (n = 16)	0 (0.0%)	1 (6.3%)	9 (56.3%)	6 (37.5%)
Systematically collecting information on students' progress. (n = 16)	0 (0.0%)	1 (6.3%)	8 (50.0%)	7 (43.8%)
Identifying patterns of student understandings or misconceptions (n = 16)	0 (0.0%)	1 (6.3%)	7 (43.8%)	8 (50.0%)
Using evidence of student progress on standards to modify subsequent instruction (n = 16)	0 (0.0%)	2 (12.5%)	6 (37.5%)	8 (50.0%)

6 Impact on Student Learning

A8. Please indicate to what extent LDC had a positive effect on students in the following areas:

	Not at all	A little	Moderately	A great deal
Reading skills (n = 15)	0 (0.0%)	1 (6.7%)	11 (73.3%)	3 (20.0%)
Content knowledge (n = 15)	0 (0.0%)	1 (6.7%)	8 (53.3%)	6 (40.0%)
Ability to complete writing assignments (n = 15)	0 (0.0%)	2 (13.3%)	6 (40.0%)	7 (46.7%)
Quality of students' writing (n = 15)	0 (0.0%)	2 (13.3%)	9 (60.0%)	4 (26.7%)
College and career ready skills (n = 15)	0 (0.0%)	2 (13.3%)	8 (53.3%)	5 (33.3%)
Capacity to analyze and understand the components of a writing assignment (n = 15)	0 (0.0%)	2 (13.3%)	7 (46.7%)	6 (40.0%)
Speaking and listening skills (n = 15)	0 (0.0%)	1 (6.7%)	10 (66.7%)	4 (26.7%)
Overall literacy performance (n = 15)	0 (0.0%)	2 (13.3%)	9 (60.0%)	4 (26.7%)
Performance on assessments throughout the school year (n = 15)	0 (0.0%)	1 (6.7%)	10 (66.7%)	4 (26.7%)

7 Administrator Leadership Role

A9. Please indicate the degree to which you agree or disagree with the following statements about your role in leading LDC implementation in your school:

	Strongly disagree	Disagree	Agree	Strongly agree
I was able to shape LDC implementation at my school. (n = 15)	0 (0.0%)	1 (6.7%)	10 (66.7%)	4 (26.7%)
I met regularly with the LDC teacher leader in my school to stay abreast of implementation progress. (n = 15)	0 (0.0%)	1 (6.7%)	9 (60.0%)	5 (33.3%)
I was involved in discussions about differentiating LDC implementation to meet teacher learning needs. (n = 15)	0 (0.0%)	1 (6.7%)	11 (73.3%)	3 (20.0%)
I led discussions about how to expand my school's LDC implementation in future years. (n = 15)	0 (0.0%)	2 (13.3%)	9 (60.0%)	4 (26.7%)
I made changes to school schedules to accommodate LDC professional learning time. (n = 15)	0 (0.0%)	1 (6.7%)	9 (60.0%)	5 (33.3%)
I allocated resources such as teacher time, payment, administrator time, support staff, sub coverage, etc., to ensure the LDC team could meet. (n = 15)	0 (0.0%)	1 (6.7%)	7 (46.7%)	7 (46.7%)

8 Alignment

A10. Please indicate the degree to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
Our school connected LDC implementation to our specific schoolwide goals. (n = 15)	0 (0.0%)	0 (0.0%)	11 (73.3%)	4 (26.7%)
LDC helped teachers create writing assignments to use within their current curricula. (n = 15)	0 (0.0%)	0 (0.0%)	10 (66.7%)	5 (33.3%)
LDC complemented other initiatives taking place in my school. (n = 15)	0 (0.0%)	0 (0.0%)	9 (60.0%)	6 (40.0%)
I view LDC as a strategy for implementing my state's College- and Career-Ready Standards. (n = 15)	0 (0.0%)	0 (0.0%)	8 (53.3%)	7 (46.7%)
The time spent implementing LDC interfered with other important initiatives at my school. (n = 15)	2 (13.3%)	7 (46.7%)	5 (33.3%)	1 (6.7%)
LDC helped prepare students in my school for current state assessments. (n = 15)	0 (0.0%)	0 (0.0%)	12 (80.0%)	3 (20.0%)
It was difficult for teachers to focus on LDC because of other competing priorities at the school. (n = 15)	1 (6.7%)	5 (33.3%)	9 (60.0%)	0 (0.0%)
I am using LDC to implement standards-driven assignments within the existing curriculum. (n = 15)	0 (0.0%)	0 (0.0%)	12 (80.0%)	3 (20.0%)
LDC helped improve teacher evaluation ratings. (n = 15)	0 (0.0%)	1 (6.7%)	12 (80.0%)	2 (13.3%)

9 Scale-up and Sustainability

A11. Please indicate the degree to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree	Don't know
I expect that most teachers participating in LDC this year will continue to do so next year. (n = 15)	0 (0.0%)	1 (6.7%)	7 (46.7%)	6 (40.0%)	1 (6.7%)
Teachers at my school who were not part of the LDC PLC meetings used the LDC planning process and/or LDC CoreTools. (n = 15)	0 (0.0%)	8 (53.3%)	2 (13.3%)	2 (13.3%)	3 (20.0%)
As a result of LDC, new collaborations across grades and/or subjects were created or are being launched at my school. (n = 15)	0 (0.0%)	4 (26.7%)	9 (60.0%)	1 (6.7%)	1 (6.7%)
Teachers and administrators at my school are committed to sustaining the LDC initiative. (n = 15)	0 (0.0%)	1 (6.7%)	10 (66.7%)	3 (20.0%)	1 (6.7%)
I expect our LDC PLC to increase in size next year. (n = 15)	0 (0.0%)	3 (20.0%)	6 (40.0%)	3 (20.0%)	3 (20.0%)

10 District Support

A12. Please indicate the degree to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree	Don't know
District leaders supported the implementation of LDC. (n = 14)	1 (7.1%)	1 (7.1%)	4 (28.6%)	1 (7.1%)	7 (50.0%)
District leaders had a firm understanding of LDC. (n = 14)	1 (7.1%)	1 (7.1%)	3 (21.4%)	0 (0.0%)	9 (64.3%)
District leaders are interested in spreading the use of LDC to additional schools. (n = 14)	1 (7.1%)	1 (7.1%)	2 (14.3%)	0 (0.0%)	10 (71.4%)
District professional development efforts were aligned with the LDC initiative. (n = 14)	1 (7.1%)	2 (14.3%)	3 (21.4%)	0 (0.0%)	8 (57.1%)
District leaders visited my school to discuss the implementation of LDC. (n = 14)	1 (7.1%)	4 (28.6%)	4 (28.6%)	0 (0.0%)	5 (35.7%)

11 Areas for Improvement

There have been a number of supports for implementation of LDC in your school, including:

- *CoreTools online platform*
- *LDC online courses in the "Learn" section of CoreTools*
- *Virtual coaching*
  - *Zoom meetings, written feedback on teacher work in LDC CoreTools, emails, etc.*
- *In-person coaching*
  - *Summer training, in-person support visits from LDC and District Lead, in-person professional development opportunities, etc.*

A13. What supports did you find the most useful and why?

A14. What supports were not helpful and why?

A15. In what ways could LDC implementation be improved in your school in the future?

Appendix D:
LDC Module Rating Dimensions

Each module was rated on six dimensions. All of these were rated using a 5-point scale. With the first five, anchor points ranged from not present or realized to fully present or realized. In contrast, the overall dimension ranged from inadequate to advanced.

Dimension 1

Effective Writing Task

Definition

Degree to which teaching task makes effective use of the template task's writing mode (i.e., argumentation or explanation); requires sustained writing and effective use of ideas and evidence to substantiate claims; and is feasible for most students to complete (i.e., appropriate for the grade-level and subject matter).

Main Sources of Information

Module Creator Handout (Task)

- Read and evaluate the teaching task, student background/prior knowledge, and summary information.
- Evaluate the difficulty or ease students may encounter trying to answer the question.
- Compare module teaching task to teaching task template options.

Anchor Points	Description
5 Fully Present or Realized	The teaching task and performance expectations for the module are explicit and clear, require students to engage in higher-order thinking and writing, and are appropriate for the grade-level and subject matter.
4 Sufficiently Present or Realized	
3 Moderately Present or Realized	Clear module teaching task and performance expectations are available, but do not require students to engage in higher-order thinking and writing and/or are not appropriate for the grade-level and subject matter.
2 Barely Present or Realized	
1 Not Present or Realized	There is minimal evidence of an effort to identify an explicit and clear teaching task and performance expectations that provide opportunities for students to think critically and are appropriate for the grade-level and subject matter.

Dimension 2

Alignment to CCSS, Local, State Literacy and Content Standards

Definition

Extent to which module addresses content essential to the discipline, as well as reading comprehension and writing standards informed by local and state standards.

Main Sources of Information

Module Creator Handout (Task)

- Read and evaluate the standards included in the module.
- Module should include ELA as well as subject matter CCSS/state standards.
- Compare and contrast the standards the module includes with those that could have been included.
- Particular attention to content standards (CCSS History/Social Studies, Science, and Technical Subjects); State Standards; Specific Reading, Writing, Speaking/Listening, Language Skills

Anchor Points	Description
5 Fully Present or Realized	Module specifically addresses content essential to CCSS and local or state standards in science or social studies, as well as reading comprehension and writing. All standards are well aligned to the topic and teaching task.
4 Sufficiently Present or Realized	
3 Moderately Present or Realized	Module broadly addresses content essential to CCSS and local or state standards in science or social studies and reading comprehension and writing. Standards are sufficiently aligned to the topic and teaching task.
2 Barely Present or Realized	
1 Not Present or Realized	Minimal evidence that module addresses content essential to the discipline and literacy standards. Standards are poorly aligned to the topic and teaching task.

Dimension 3

Fidelity to LDC Module Instruction

Definition

Degree to which module instruction, activities, and teaching task address each of the four stages of instructional practice (preparation for the task, reading process, transition to writing, writing process).

Main Sources of Information

Module Creator Handout (Instruction) and Information Sheet

- Evaluate for distribution of activities and time spent on each of the four stages of instructional practice.

Anchor Points	Description
5 Fully Present or Realized	The module instruction, activities, and teaching task reflect deliberate attention and fidelity to the four discrete stages of LDC module instruction. Classroom materials reflect demonstrable effort to develop instructional scaffolding within and across each stage of instruction.
4 Sufficiently Present or Realized	
3 Moderately Present or Realized	The module instruction, activities, and teaching task reflect moderate attention and fidelity to the four discrete stages of LDC module instruction. Classroom materials reflect sufficient effort to develop instructional scaffolding within and across each stage of instruction.
2 Barely Present or Realized	
1 Not Present or Realized	The module instruction, activities, and teaching task reflect poor attention and lack of fidelity to the four discrete stages of LDC module instruction. Classroom materials reflect inadequate effort to develop instructional scaffolding within and across each stage of instruction.

Dimension
4

Quality Instructional Strategies

Definition

Degree to which the module provides clear instructional strategies aimed at helping students develop literacy skills and successfully complete the teaching task. In addition, the degree to which module instruction and activities scaffold critical thinking and performance in a way that is meaningful within the context of a given field or subject matter.

Main Sources of Information

Module Creator Handout (Instruction), Classroom Handouts, and Student Work

- Evaluate extent to which the module activities scaffold critical thinking and student performance within the context of the subject matter at the core of the teaching task.
- Evaluate extent to which instructional strategies guide student learning in literacy and ability to complete the teaching task.

Anchor Points	Description
5 Fully Present or Realized	Module provides clear and targeted instructional strategies and activities that scaffold student learning and promote critical thinking in social studies or science. There is explicit attention to helping students develop an accurate understanding of the topic and teaching task, and literacy skills necessary to complete the writing task successfully.
4 Sufficiently Present or Realized	
3 Moderately Present or Realized	Instructional strategies and activities are available to support adequate student learning and critical thinking in social studies or science. There is moderate attention to helping students develop an understanding of the topic and teaching task, and literacy skills necessary to complete the writing task.
2 Barely Present or Realized	
1 Not Present or Realized	Limited instructional strategies and activities are available to support student learning and critical thinking in social studies or science. Insufficient attention to helping students develop an understanding of the topic and teaching task, or literacy skills necessary to complete the writing task.

Dimension 5

Coherence and Clarity of Module

Definition

The degree of logical alignment found between the teaching task and the goals of the module with the readings, mini-tasks, and instructional strategies.

Main Sources of Information

Module Creator Handout (Instruction), Classroom Handouts, and Student Work

Anchor Points	Description
5 Fully Present or Realized	Strong alignment between the teaching task and goals of the module—including the CCSS and local and state literacy and content standards—with the readings, mini-tasks, student work, and instructional strategies.
4 Sufficiently Present or Realized	
3 Moderately Present or Realized	Moderate alignment between the teaching task and goals of the module—including the CCSS and local and state literacy and content standards—with the readings, mini-tasks, student work, and instructional strategies.
2 Barely Present or Realized	
1 Not Present or Realized	Poor alignment between the teaching task and goals of the module—including the CCSS and local and state literacy and content standards—with the readings, mini-tasks, student work, and instructional strategies.

Dimension
6

Overall Impression

Definition

A holistic assessment of the LDC Module.

Main Sources of Information

Module Creator Handout, Classroom Handouts, and Student Work

- To what extent does this module contribute to student college readiness and development of advanced literacy skills?

Anchor Points	
5	Advanced LDC Module Implementation
4	Proficient LDC Module Implementation
3	Adequate LDC Module Implementation
2	Marginal LDC Module Implementation
1	Inadequate LDC Module Implementation

Appendix E:
Principal Interviews

To better understand teacher retention rates of LDC schools after the 2016-2017 school year, we conducted an interview study of school administrators. Twenty principals and assistant principals volunteered to be interviewed. This section presents the methods and results of the principal interviews.

Method

Instrument. We developed a six-question interview protocol for principals and assistant principals. Some of the interview questions had sub-questions. Five of the questions were asked of all principals, regardless of their schools' retention typology, and one question (question 5) differed slightly based on the school's retention typology. See Figure E1 for the interview protocol.

Question No.	Question	Given to
1	Why did you initially participate in LDC? • What were your goals when you signed on and how well have those goals been met thus far?	All
2	What was your role in LDC implementation? • Who else at the school supported LDC? • How much did you see of PLC meetings? • Was part of your role to give feedback on LDC instruction? (If needed: Who gave feedback on LDC instruction?)	All
3	Could you tell me about outside support – from both LDC and the district – and what worked or didn't work?	All
4	What were the incentives for teachers' participation in LDC? • How would you describe teacher buy-in and commitment to LDC? • Did teachers receive any additional pay? If so, for what?	All
5	What would you say are the main factors that led to not continuing with LDC?	Drop out
	a) Looking across the district, we noticed that some schools chose to continue with LDC for another year and others chose to stop. What would you say are the main factors that led to continuing with LDC? b) We noticed that none of the year-1 teachers participated in year 2, so the year-2 PLC began with an entirely new set of teachers. Why do you think that was? c) Were there changes in implementation to keep this from happening again the following year?	Zero retention

	a) Looking across the district, we noticed that some schools chose to continue with LDC for another year and others chose to stop. What would you say are the main factors that led to continuing with LDC? b) We noticed that many teachers who participated in Year 1 did not participate in Year 2. Why do you think that was?	Very Low and Low Retention
	a) Looking across the district, we noticed that some schools chose to continue with LDC for another year and others chose to stop. What would you say are the main factors that led to continuing with LDC? b) We noticed that many teachers who participated in Year 1 continued into Year 2. Why do you think that was?	Moderate-High Retention
6	Do you have any advice for strengthening LDC or is there anything else we should know about your experience with LDC?	All

Figure E1. Principal and assistant principal interview protocol.

Participants. During the 2016-2017 school year, 48 total schools participated in the i3 LDC program including 28 in the New York City Department of Education (NYCDOE) and 20 in the West Coast district which is the subject of this report. We categorized the schools into retention typologies based on a school's total teacher participants in 2016-2017 and returning teachers in 2017-2018. Using the proportions of the same teacher participating for the two years, we created five school retention typologies:

- drop out (the school has no teachers participating in LDC in 2017-2018);
- zero retention (no 2016-2017 teachers returning to LDC, but new teachers in the school are participating in 2017-2018);
- very low retention (less than 1/3 of teachers returning);
- low retention (between 1/3 and 2/3 returning teachers); and
- moderate to high retention (over 2/3 teachers returning).

The following table show the number of schools per retention typology in NYCDOE and the West Coast district.

Table E1

Number of Schools and Proportion of Retention Typologies for NYCDOE and West Coast district in 2016-2017

Retention type	Number of NYCDOE schools	Proportion of total NYCDOE schools	Number of West Coast district schools	Proportion of total West Coast district schools
Dropped out after 2016-2017	10	36%	6	30%
Zero retention	1	4%	2	10%
Very low teacher retention	7	25%	3	15%
Low teacher retention	5	18%	2	10%
Moderate to high teacher retention	5	18%	7	35%
Total	28		20	

All LDC schools from the 2016-2017 cohort were contacted for a phone interview by email, and a total of 20 principals and assistant principals (10, or 36%, of NYCDOE schools and 10, or 50%, of West Coast district schools) participated in the interview. Table E2 shows the school retention typologies that are represented in this sample. Of the principals and assistant principals who participated in an interview, most were from very low teacher retention schools (8 participants), followed by moderate to high teacher retentions schools (6 participants). We also had three principals or assistant principals from drop out schools participate, two principals from low teacher retention schools, and one principal in a zero retention school.

Table E2

School Retention Typologies Represented in the Study

Retention Type	Number of participating NYCDOE schools	Proportion of NYCDOE schools in the typology	Number of participating West Coast district schools	Proportion of West Coast district schools in the typology
Dropped out after 2016-2017	2	20%	1	17%
Zero retention	0	0%	1	50%
Very low teacher retention	5	71%	3	100%
Low teacher retention	1	20%	1	50%
Moderate to high teacher retention	2	40%	4	57%
Total	10		10	

Procedures. We originally contacted principals of all schools except for schools designated as low retention. This was done as sampling strategy for a case study methodology to understand reasons behind high and low retention schools. Initial emails were sent to 41 schools in both districts (23 in NYCDOE and 18 in the West Coast district) on the week of June 16, 2018. A minimum of three follow-up emails for non-responding administrators were sent between June 25 and August 6, 2018. During this window, nine NYCDOE principals or assistant principals participated (39% of schools in the first round) and seven principals from the West Coast distirct participated (39% of schools in the first round). One West Coast district principal contacted us to say that she did not have enough knowledge about the LDC program in the school because she was the new principal.

Because of the low response rate, we decided to contact the principals in the low teacher retention schools (five in NYCDOE and two in the West Coast district) to increase the numbers of participants. The initial email for these NYCDOE principals were sent on September 20, 2018 and, for West Coast district principals, between October 1 and October 8, 2018. Follow-up emails were sent to NYCDOE and West Coast district principals between the weeks of October 1 and October 19, 2018. We also reached out to the LDC grant directors in NYCDOE and the West Coast district for recruitment support. Between the new round of emails and support from the LDC grant directors, four additional school leaders participated in interviews, bringing our total participants to 20 principals and assistant principals (10, or 36%, of NYCDOE schools and 10, or 50%, of West Coast district schools).

Interviews were scheduled at times most convenient to the principal or assistant principal. Interviews were conducted by two researchers following the protocol, and the interviews ranged from about eight minutes to 30 minutes in length. Participant consent was obtained prior to the interviews, and interviews were recorded.

Analysis. Recordings of interviews were transcribed. (For one interview, due to researcher and equipment error, the interview was not recorded. However, notes taken by the researcher during the interview were used for general counts in the analysis.) Transcriptions were read iteratively and coded for broad themes using grounded theory (Glaser & Strauss, 1967). Multiple close readings of each group transcript were conducted in order to summarize the data and identify themes related to reasons for a school's retention (or lack thereof) of teachers from year 1 to year 2 of LDC implementation. A coding scheme was developed based on targeted areas of interest in relation to reasons for retention.

Results

Qualitative results from the data are presented in five main categories: reasons for teachers continuing in LDC, meeting goals, administrator's role, teacher buy-in, and outside support.

Reasons for teachers continuing or leaving LDC in year 2. To understand why teachers remained or left LDC after year 1, interview data were coded into three main categories:

teacher or grade level decision, administrative decision, and mandatory participation. In teacher or grade level decisions, individual teachers, a grade level, or a content-area team (e.g., English teachers) were free to decide to return the following year. Administrative decisions typically involved the principal deciding on changing the grade level or content-area teachers who would participate in the second year of implementation (e.g., moving from second grade to third grade teachers; dropping math teachers but keeping science teachers in the program). A couple principals also decided that LDC participation would be better suited for a particular level of teacher. For example, a principal decided to focus year 2 teacher participation on "teachers that were new to the profession and teachers that were struggling instructionally;" therefore, only a few teachers continued from year 1 to year 2 at that site. Mandatory participation, which is based on an administrator's decision, reflected schools where teachers were told that participation in the second year of LDC was not voluntary. Table E3 shows the reasons for retention by school retention typology.

Table E3

Teachers' Participation in LDC in Year 2 by Retention Typology

Retention typology	Teacher/grade level decision	Administrative decision	Mandatory participation
Dropped out after 2016-2017	1	2	0
Zero retention	0	1	0
Very low teacher retention	4	4	0
Low teacher retention	1	0	1
Moderate to high teacher retention	4	0	2
Total	10	7	3

For the three drop out schools in our sample, two of the schools had a change in leadership. One had a new principal who came in before the second year of LDC implementation and decided not to participate in LDC, and the other school had a new superintendent who did not continue partnering with LDC. For the last of the three drop out schools, the small group of teachers who were in the first year of implementation decided not to continue because of "teacher and administrator burn out." This school had too many initiatives that were handled by a small number of administrative staff and the same teachers who were also part of the LDC implementation.

For the one zero retention school in our sample, the principal decided to change the teachers for year 2. The grade level that was selected to participate in LDC the first year found the program successful, and so for year 2, "other teachers haven't been exposed, and we wanted more teachers to have access…to spread the wealth within the school," so another

grade level was selected to participate. In one of the low retention schools, the principal said that participation in LDC was mandatory, but many of teachers who were part of year 1 implementation left the school the following year.

For the 10 schools that were coded as a teacher/grade level decision, half of those decisions were based on the grade-level or content-area team (e.g., science teachers) deciding to leave LDC because they started a new program or initiative the second year and did not have the time to participate in LDC. For the moderate to high teacher retention schools who were coded as teacher/grade level decision, the majority of teachers in those schools decided to stay in LDC the second year.

Meeting goals. We asked participants their reasons for participating in LDC during the first year. The most popular reasons for participating in LDC were its alignment to standards and rigorous tasks. Principals and assistant principals also stated that they felt both teachers and students in their schools needed assignments where literacy instruction, the writing tasks, and the writing process were a focus. Other responses included wanting better lesson planning, collaboration, and content-area instruction. Interestingly, three principals said that LDC appealed to them as they were new to the school or position.

After stating their reasons for participation, we asked if these goals were met after the first year of implementation. Table E4 shows participant responses to whether goals were met by school typology. The majority of principals and assistant principals responded positively: 12 (60%) said yes, five expressed mixed feelings about accomplishing their original goals for LDC (25%), and three said that their goals were not met (15%). From these responses, meeting goals for LDC did not appear to influence retention of teachers. For example, two of the three dropout schools reported meeting their LDC goals for participation, yet they didn't remain in the program. Teacher retention seemed to be tied more to teacher and principal decisions (see section above).

Table E4

Principal Reponses for LDC Goals by School Typology

School typology	LDC goals met		
	Yes	No	Mixed
Dropped out after 2016-2017	2	1	0
Zero retention	1	0	0
Very low teacher retention	4	1	3
Low teacher retention	1	1	0
Moderate to high teacher retention	4	0	2
Total	12	3	5

Administrator's role. The majority of principals and assistant principals in our sample reported having an active role in supporting LDC implementation. Sixteen (80%) attended LDC PLCs, and those who could not make the PLCs were able to get a summary of the meetings from their assistant principals or lead teachers. For those who were able to attend some PLCs, the amount of time they were able to sit in on the PLCs varied. Some principals were only able to drop in for a portion of the PLCs. For example, one principal (moderate to high retention school) said, "I would probably just go in the last 15 minutes. I don't think I was in a full session all the time. But I would touch bases and then each teacher would give me a wrap up summary of what they had done, what they were working on." Others were able to go to almost all PLCs. As the zero retention school principal said, "I was a participant, also, in the learning." Sixteen participants (80%) also reported that they gave feedback on LDC instruction. However, the degree to which principals or assistant principals gave feedback varied. Table E5 shows the numbers of participants who attended PLCs and provided feedback on LDC instruction.

Table E5

Participation of Principals and Assistant Principals in LDC Implementation by Retention Type

Retention typology	Attended PLCs	Provided feedback
Dropped out after 2016-2017	3	3
Zero retention	1	1
Very low teacher retention	6	6
Low teacher retention	1	2
Moderate to high teacher retention	5	4
Total	16	16

Teacher buy-in. Most of the principals and assistant principals mentioned increasing skills and knowledge, collaboration, and student achievement and accessing LDC materials as incentives for teachers. Besides these incentives that were actually part of the LDC implementation, few schools were able to provide additional school-based supports. Eight schools (40%) in our sample reported providing teachers with more tangible incentives for their participation in LCD, such as additional pay and time, and four of the eight gave multiple incentives. Table E6 shows the number of these types teacher incentives by school typology. No pattern emerges that connects teacher incentives to retention typology. However, it is notable that the majority of schools in the sample did not provide tangible incentives (i.e., pay, extra time, teacher evaluation) to teachers for their participation for LDC.

Table E6

Teacher Incentives by School Typology

Retention typology	Additional pay	Extra time	Teacher evaluation
Dropped out after 2016-2017	0	0	0
Zero retention	1	1	0
Very low teacher retention	2	0	1
Low teacher retention	1	2	0
Moderate to high teacher retention	1	1	1
Total	5	4	2

Five schools (25%) were able to pay teachers for their participation in LCD. Aside from pay, some principals were able to support participating teachers with extra time, such as adjusting the schedule to give teachers more time to meet during the week or giving teachers a release day. For example, the principal from the zero retention school said, “Initially, it was kind of an imposition of time, but when we created extra time and space for the teachers to meet, they were appreciative. So they had more buy-in.” Another principal (low retention school) said, “I make it very easy for teachers, because I've built in time in their schedule for them to meet for LDC. There are no discrepancies in terms of when we should meet or how can we meet, or what needs to be done, which is usually the issue sometimes when it comes to work with outside consultants or providers, right?”

Two schools incentivized participation through teacher evaluations. One principal (very low retention school) postponed teacher evaluations for the year. The other principal (moderate to high retention school) said, “I very much tied it to teacher performance and my expectation of what high quality planning looks like.” For this principal, he knew LDC would be “transformative. I knew that if they got through it and actually did it, the carrot would reveal itself in the students’ performance. And I knew my teachers were committed; I knew they

wanted our kids to do well. They just needed to be pushed through the process to see how to get the kids to do well."

Outside support. Overwhelmingly positive responses were reported from our sample regarding LDC support the schools received. All principals and assistant principals mentioned either training or coaching that LDC provided. Two principals, both from a very low retention schools, also mentioned that the administrator meetings as helpful. As one principal described, "It gave an opportunity to speak to other people who were in the project, and it also gave an opportunity to actually go through all of the CoreTools that were there to support the teachers." Two principals (both from New York) also found site visits to another school as helpful: "There are sites where the work is going on really nicely, and we were able to go over to those sites and see presentations from the principal and her teachers on how they have embedded this entire system into their daily program." Five participants mentioned district support being available.

Discussion

Participants in this study all reported playing an active role in LDC implementation at their school site, and most said that their goals for participation were met. They also overwhelmingly responded favorably to LDC support, and district support, if provided or perceived, was also helpful. The principal interviews showed the diversity of reasons for why schools were able to retain teachers, and they also show why teachers left. The main reason for teacher retention was teacher and grade-level team decisions to leave or stay, followed by the principals' decision to switch participation of teachers from year 1 to year 2. Teacher buy-in also seemed to affect teachers' decisions for remaining or continuing. We did not find any consistent trends for retention typology; that is, we cannot characterize reasons for each retention typology and say, for example, all drop out schools had these characteristics or most moderate to high retention schools had other characteristics. Teacher retention in LDC from year 1 to year 2 was due to a myriad of factors that worked in combination at each school.

Appendix F:
Module Artifact Ratings

The following presents further details of the module analyses. First we present the methodology and results of the generalizability theory studies. This is followed by the additional tables for the descriptive analyses.

Generalizability Study

Generalizability theory is a statistical framework for examining multiple sources of potential error during the scoring process. For each grade band, we first modeled score variability across all six dimensions using a two-faceted design, whereby we estimated variance components for module by rater by dimension (t*r*d). The goal here was to separate true variation in the modules from other potential sources of measurement error. The main effects reflect true variation across modules (σ2t) and error variance across raters (σ2r) and dimensions (σ2d), while the error term (σ2trd,e) reflects unexplained residual error in the model. To disentangle the sources of potential error further, we also used a single-faceted design to examine potential error within the scoring of each dimension. As with the first set of models, the main effect reflects true variation across teachers (σ2t) and error variance across raters (σ2r).

Elementary module results. Generalizability theory models were conducted to examine potential error in the scoring process for the elementary modules. Results from the two-faceted and one-faceted models that examine error across and within dimensions are presented in Tables F1 and F2. As would be the goal of any rating session, most of the variation found for the elementary modules was due directly to differences in the modules (48%) or to differences in the modules by dimension (29%). Despite this, 16% of the variation was due either directly or through interaction with the raters, and 5% of the variation was unexplained by the two-faceted model used.

Table F1

Generalizability Study of the Elementary Module Ratings across Dimensions (n = 84)

Source	Var.	%
Module (σ2t)	0.53	48.21
Rater (σ2r)	0.03	2.83
Dimension (σ2d)	0.01	1.27
Module*Dimension (σ2td)	0.32	28.68
Rater*Dimension (σ2rd)	0.08	7.42
Module*Rater (σ2tr)	0.07	6.18
Error (σ2trd,e)	0.06	5.41

As previously mentioned, we also used a one-faceted design to disentangle variation in the ratings that was due either directly or through interaction with the dimensions (see Table F2). As would be desired, the greatest source of variation for each dimension was due directly to differences in the modules. Despite this, moderate amounts of variation could be attributed either directly or through interaction with the raters for Dimensions 3 through 6. For example, with Dimension 5, which measures coherence and clarity of the module, 10% of the variation was due to the raters and an additional 20% was due to an interaction between raters and modules. Furthermore, the greatest amount of variance due to an interaction between raters and modules was found for Dimensions 3 and 4 (24%, respectively), which measure fidelity to LDC instruction and quality instructional strategies.

Table F2

Generalizability Study of the Elementary Module Ratings for Each Dimension (n = 84)

	Module (σ2t)		Rater (σ2r)		Module*Rater (σ2tr)		Error (σ2trd,e)	
Dimension	Var.	%	Var.	%	Var.	%	Var.	%
1. Effective writing task	0.76	87.39	0.02	2.30	0.09	10.31	0.00	0.00
2. Standards alignment	0.93	86.69	0.13	12.46	0.01	0.85	0.00	0.00
3. Fidelity to LDC instruction	0.87	68.81	0.08	6.71	0.31	24.48	0.00	0.00
4. Quality instructional strategies	0.87	68.81	0.08	6.71	0.31	24.48	0.00	0.00
5. Coherence/clarity of module	0.75	70.13	0.11	10.17	0.21	19.71	0.00	0.00
6. Overall impression	0.61	62.18	0.17	16.89	0.21	20.93	0.00	0.00

Secondary module results. Generalizability theory models were conducted to examine potential error in the scoring process for the secondary modules. Tables F3 and F4 present results from the two-faceted and one-faceted models that examine error across and within dimensions. As would be the goal of any rating session, most of the variation found in the ratings was due directly to differences in the modules (39%) or to differences in the modules by dimension (49%). Furthermore, less than 5% of the variation for the secondary modules was due either directly or indirectly to the raters. What is of concern, though, is that 7% of the variation in ratings for the two-faceted model was unexplained.

Table F3

Generalizability Study of the Secondary Module Ratings across Dimensions (n = 103)

Source	Var.	%
Module (σ2t)	0.48	39.15
Rater (σ2r)	0.02	1.59
Dimension (σ2d)	0.00	0.14
Module*Dimension (σ2td)	0.61	49.18
Rater*Dimension (σ2rd)	0.02	1.33
Module*Rater (σ2tr)	0.02	1.92
Error (σ2trd,e)	0.08	6.68

We also used a one-faceted design to disentangle the variance that was due either directly or through interaction with the dimensions (see Table F4). As would be desired, 75% to 93% of the variance found for each dimension was attributable to differences in the modules. Furthermore, less than 8% of the variance for each dimension was due directly to the raters. The only concerns involved the moderate amounts of variance due to an interaction between modules and raters for Dimensions 1 and 2, which focus on the effective writing task and standards alignment (16% and 18%, respectively). Finally, there was no unexplained error variance found for any of the one-faceted models.

Table F4

Generalizability Study of the Secondary Module Ratings for Each Dimension (n = 103)

Dimension	Module (σ2t)		Rater (σ2r)		Module*Rater (σ2tr)		Error (σ2trd,e)	
	Var.	%	Var.	%	Var.	%	Var.	%
1. Effective writing task	1.20	83.86	0.01	0.40	0.23	15.74	0.00	0.00
2. Standards alignment	0.80	74.81	0.08	7.47	0.19	17.72	0.00	0.00
3. Fidelity to LDC instruction	1.30	92.94	0.02	1.22	0.08	5.84	0.00	0.00
4. Quality instructional strategies	1.23	91.75	0.03	1.91	0.08	6.34	0.00	0.00
5. Coherence/clarity of module	1.19	91.52	0.05	4.11	0.06	4.37	0.00	0.00
6. Overall impression	0.82	93.17	0.06	6.38	0.00	0.46	0.00	0.00

Note. Negative estimates of variance were changed to zero in order to calculate percentages (see Shavelson & Webb, 1991)

Summary. Generalizability models were fit for the overall samples for the two grade bands. As would be hoped for, when examining the one-faceted models, the majority of variation for the elementary and secondary ratings were due directly to differences in the modules (48%, 39%) or to differing quality in the modules across dimensions (29%, 49%). Likewise, results from the two-faceted models showed that the majority of variation within dimension was due to differences in both the elementary modules (62% to 88%) and secondary modules (75% to 93%). Despite this, for the elementary modules about 20% of the variation in the ratings was due to an interaction between the raters and modules (20% to 24%). In contrast, the only two dimensions in which moderate variation was found because of an interaction between raters and the secondary modules involved the effective writing task and standards alignment (16% to 18%).

Descriptive Results

The following section presents expanded descriptive results for both the primary and secondary modules. We first present background information about the modules rated. This is followed by descriptive statistics and percentages for the elementary modules and the secondary modules. Finally, we present further descriptive statistics and percentages for the exploratory analysis of elementary modules.

Table F5

Background Variables for the Module Analysis

Variables	Elementary		Secondary		Total	
	#	%	#	%	#	%
Cohort						
Cohort 1 Returning	10	15.38	22	28.95	32	22.70
Cohort 1 New	1	1.54	21	27.63	22	15.60
Cohort 2	54	83.08	33	43.42	87	61.70
Subject						
ELA	34	52.31	44	57.89	78	55.32
Science	9	13.85	9	11.84	18	12.77
Social Studies	22	33.85	23	30.26	45	31.91
Module origin						
Adapted (Other authors)	39	60.00	51	67.11	90	63.83
Adapted (Same author)	11	16.92	9	11.84	20	14.18
Original	15	23.08	16	21.05	31	21.99
Author Count						
Co-authored	21	32.31	24	31.58	45	31.91
Sole	44	67.69	52	68.42	96	68.09
Module type						
One week, one text	3	4.62	9	11.84	12	8.51
Regular	62	95.38	67	88.16	129	91.49
Module components						
Student background	44	67.69	51	67.11	95	67.38
Extension	20	30.77	25	32.89	45	31.91
Teacher reflection	22	33.85	31	40.79	53	37.59
Total	**65**	**46.10**	**76**	**53.90**	**141**	**100.00**

Note. Teacher reflection counts calculated from the metadata.

Table F6

Descriptive Statistics for the Elementary Modules by Content Area

Dimension	Mean	Std. Dev.	Median	Mode	Minimum	Maximum
ELA (*n* = 34)						
1. Effective writing task	3.76	1.21	4.00	5.00	1.00	5.00
2. Standards alignment	3.99	0.66	4.00	4.00	3.00	5.00
3. Fidelity to LDC instruction	3.15	1.23	3.00	4.00	1.00	5.00
4. Quality instructional strategies	3.24	0.92	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	3.32	0.88	3.00	3.00	2.00	5.00
6. Overall impression	3.38	0.85	3.00	3.00	2.00	5.00
SCIENCE (*n* = 9)						
1. Effective writing task	3.67	1.41	4.00	4.00	1.00	5.00
2. Standards alignment	2.44	1.51	2.00	2.00	1.00	5.00
3. Fidelity to LDC instruction	3.67	1.22	4.00	4.00	1.00	5.00
4. Quality instructional strategies	2.78	1.20	3.00	3.00	1.00	4.00
5. Coherence/clarity of module	2.33	0.87	3.00	3.00	1.00	3.00
6. Overall impression	2.89	0.93	3.00	3.00	1.00	4.00
SOCIAL STUDIES (*n* = 22)						
1. Effective writing task	4.36	1.00	4.00	5.00	1.00	5.00
2. Standards alignment	4.09	1.11	4.00	5.00	1.00	5.00
3. Fidelity to LDC instruction	4.14	1.13	4.50	5.00	1.00	5.00
4. Quality instructional strategies	3.45	1.37	4.00	4.00	1.00	5.00
5. Coherence/clarity of module	3.64	1.18	4.00	4.00	1.00	5.00
6. Overall impression	3.86	0.94	4.00	4.00	2.00	5.00
OVERALL (*n* = 65)						
1. Effective writing task	3.95	1.19	4.00	5.00	1.00	5.00
2. Standards alignment	3.81	1.10	4.00	4.00	1.00	5.00
3. Fidelity to LDC instruction	3.55	1.26	4.00	4.00	1.00	5.00
4. Quality instructional strategies	3.25	1.13	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	3.29	1.06	3.00	3.00	1.00	5.00
6. Overall impression	3.48	0.94	3.00	3.00	1.00	5.00

Table F7

Distribution (Percentage) of Ratings for the Elementary Modules by Content Area

Dimension	1	2	3	4	5
ELA (*n* = 43)					
1. Effective writing task	2.94	17.65	14.71	29.41	35.29
2. Standards alignment	0.00	0.00	20.59	55.88	20.59
3. Fidelity to LDC instruction	11.76	20.59	20.59	35.29	11.76
4. Quality instructional strategies	2.94	14.71	47.06	26.47	8.82
5. Coherence/clarity of module	0.00	17.65	41.18	32.35	8.82
6. Overall impression	0.00	14.71	41.18	35.29	8.82
SCIENCE (*n* = 9)					
1. Effective writing task	11.11	11.11	11.11	33.33	33.33
2. Standards alignment	22.22	55.56	0.00	0.00	22.22
3. Fidelity to LDC instruction	11.11	0.00	22.22	44.44	22.22
4. Quality instructional strategies	22.22	11.11	33.33	33.33	0.00
5. Coherence/clarity of module	22.22	22.22	55.56	0.00	0.00
6. Overall impression	11.11	11.11	55.56	22.22	0.00
SOCIAL STUDIES (*n* = 22)					
1. Effective writing task	4.55	0.00	9.09	27.27	59.09
2. Standards alignment	4.55	4.55	13.64	31.82	45.45
3. Fidelity to LDC instruction	4.55	4.55	13.64	27.27	50.00
4. Quality instructional strategies	13.64	9.09	22.73	27.27	27.27
5. Coherence/clarity of module	9.09	4.55	22.73	40.91	22.73
6. Overall impression	0.00	9.09	22.73	40.91	27.27
OVERALL (*n* = 65)					
1. Effective writing task	4.62	10.77	12.31	19.23	43.08
2. Standards alignment	4.62	9.23	15.38	40.00	29.23
3. Fidelity to LDC instruction	9.23	12.31	18.46	33.85	26.15
4. Quality instructional strategies	9.23	12.31	36.92	27.69	13.85
5. Coherence/clarity of module	6.15	13.85	36.92	30.77	12.31
6. Overall impression	1.54	12.31	36.92	35.38	13.85

Table F8

Descriptive Statistics for the Elementary Modules by Cohort

Dimension	Mean	Std. Dev.	Median	Mode	Minimum	Maximum
COHORT 1 RETURNING (*n* = 10)						
1. Effective writing task	4.10	0.99	4.00	4.00	2.00	5.00
2. Standards alignment	4.10	0.74	4.00	4.00	3.00	5.00
3. Fidelity to LDC instruction	3.80	0.92	4.00	4.00	2.00	5.00
4. Quality instructional strategies	3.00	1.05	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	3.10	0.99	3.00	3.00	1.00	4.00
6. Overall impression	3.50	0.85	3.50	3.00	2.00	5.00
COHORT 1 NEW (*n* = 1)						
1. Effective writing task	5.00	5.00	5.00	5.00	5.00	5.00
2. Standards alignment	5.00	5.00	5.00	5.00	5.00	5.00
3. Fidelity to LDC instruction	5.00	5.00	5.00	5.00	5.00	5.00
4. Quality instructional strategies	5.00	5.00	5.00	5.00	5.00	5.00
5. Coherence/clarity of module	5.00	5.00	5.00	5.00	5.00	5.00
6. Overall impression	5.00	5.00	5.00	5.00	5.00	5.00
COHORT 2 (*n* = 54)						
1. Effective writing task	3.91	1.23	4.00	5.00	1.00	5.00
2. Standards alignment	3.73	1.15	4.00	4.00	1.00	5.00
3. Fidelity to LDC instruction	3.48	1.31	4.00	4.00	1.00	5.00
4. Quality instructional strategies	3.26	1.14	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	3.30	1.06	3.00	3.00	1.00	5.00
6. Overall impression	3.44	0.95	3.00	3.00	1.00	5.00
OVERALL (*n* = 65)						
1. Effective writing task	3.95	1.19	4.00	5.00	1.00	5.00
2. Standards alignment	3.81	1.10	4.00	4.00	1.00	5.00
3. Fidelity to LDC instruction	3.55	1.26	4.00	4.00	1.00	5.00
4. Quality instructional strategies	3.25	1.13	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	3.29	1.06	3.00	3.00	1.00	5.00
6. Overall impression	3.48	0.94	3.00	3.00	1.00	5.00

Table F9

Distribution (Percentage) of Ratings for the Elementary Modules by Cohort

Dimension	1	2	3	4	5
COHORT 1 RETURNING (*n* = 10)					
1. Effective writing task	0.00	10.00	10.00	40.00	40.00
2. Standards alignment	0.00	0.00	20.00	50.00	30.00
3. Fidelity to LDC instruction	0.00	10.00	20.00	50.00	20.00
4. Quality instructional strategies	10.00	10.00	60.00	10.00	10.00
5. Coherence/clarity of module	10.00	10.00	40.00	40.00	0.00
6. Overall impression	0.00	10.00	40.00	40.00	10.00
COHORT 1 NEW (*n* = 11)					
1. Effective writing task	0.00	0.00	0.00	0.00	100.00
2. Standards alignment	0.00	0.00	0.00	0.00	100.00
3. Fidelity to LDC instruction	0.00	0.00	0.00	0.00	100.00
4. Quality instructional strategies	0.00	0.00	0.00	0.00	100.00
5. Coherence/clarity of module	0.00	0.00	0.00	0.00	100.00
6. Overall impression	0.00	0.00	0.00	0.00	100.00
COHORT 2 (*n* = 54)					
1. Effective writing task	5.56	11.11	12.96	27.78	42.59
2. Standards alignment	5.56	11.11	14.81	1.85	38.89
3. Fidelity to LDC instruction	11.11	12.96	18.52	31.48	25.93
4. Quality instructional strategies	9.26	12.96	33.33	31.48	12.96
5. Coherence/clarity of module	5.56	14.81	37.04	29.63	12.96
6. Overall impression	1.85	12.96	37.04	35.19	12.96
OVERALL (*n* = 65)					
1. Effective writing task	4.62	10.77	12.31	19.23	43.08
2. Standards alignment	4.62	9.23	15.38	40.00	29.23
3. Fidelity to LDC instruction	9.23	12.31	18.46	33.85	26.15
4. Quality instructional strategies	9.23	12.31	36.92	27.69	13.85
5. Coherence/clarity of module	6.15	13.85	36.92	30.77	12.31
6. Overall impression	1.54	12.31	36.92	35.38	13.85

Table F10

Descriptive Statistics for the Secondary Modules by Content Area

Dimension	Mean	Std. Dev.	Median	Mode	Minimum	Maximum
ELA (*n* = 44)						
1. Effective writing task	3.16	1.03	3.00	3.00	1.00	5.00
2. Standards alignment	3.18	0.97	3.00	3.00	1.00	5.00
3. Fidelity to LDC instruction	3.18	1.32	3.00	3.00	1.00	5.00
4. Quality instructional strategies	3.20	1.11	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	3.09	1.05	3.00	4.00	1.00	5.00
6. Overall impression	3.09	0.83	3.00	3.00	1.00	5.00
SCIENCE (*n* = 9)						
1. Effective writing task	4.00	1.00	4.00	4.00	2.00	5.00
2. Standards alignment	2.56	1.01	2.00	2.00	2.00	5.00
3. Fidelity to LDC instruction	3.22	1.30	3.00	3.00	1.00	5.00
4. Quality instructional strategies	3.11	1.36	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	2.89	0.93	3.00	3.00	1.00	4.00
6. Overall impression	3.00	1.00	3.00	3.00	1.00	4.00
SOCIAL STUDIES (*n* = 23)						
1. Effective writing task	3.91	1.20	4.00	5.00	1.00	5.00
2. Standards alignment	3.78	0.74	4.00	4.00	2.00	5.00
3. Fidelity to LDC instruction	3.83	1.07	4.00	4.00	1.00	5.00
4. Quality instructional strategies	3.61	1.53	4.00	4.00	0.00	5.00
5. Coherence/clarity of module	3.61	1.44	4.00	5.00	0.00	5.00
6. Overall impression	3.87	1.01	4.00	5.00	2.00	5.00
OVERALL (*n* = 76)						
1. Effective writing task	3.49	1.14	3.00	3.00	1.00	5.00
2. Standards alignment	3.29	0.98	3.00	3.00	1.00	5.00
3. Fidelity to LDC instruction	3.38	1.26	3.00	3.00	1.00	5.00
4. Quality instructional strategies	3.32	1.28	3.50	4.00	0.00	5.00
5. Coherence/clarity of module	3.22	1.18	3.00	4.00	0.00	5.00
6. Overall impression	3.32	0.97	3.00	3.00	1.00	5.00

Table F11

Distribution (Percentage) of Ratings for the Secondary Modules by Content Area

Dimension	1	2	3	4	5
ELA (*n* = 44)					
1. Effective writing task	9.09	9.09	47.73	25.00	9.09
2. Standards alignment	6.82	11.36	45.45	29.55	6.82
3. Fidelity to LDC instruction	15.91	9.09	36.36	18.18	20.45
4. Quality instructional strategies	11.36	9.09	36.36	34.09	9.09
5. Coherence/clarity of module	9.09	18.18	31.82	36.36	4.55
6. Overall impression	6.82	6.82	59.09	25.00	2.27
SCIENCE (*n* = 9)					
1. Effective writing task	0.00	11.11	11.11	44.44	33.33
2. Standards alignment	0.00	66.67	22.22	0.00	11.11
3. Fidelity to LDC instruction	11.11	11.11	44.44	11.11	22.22
4. Quality instructional strategies	11.11	22.22	33.33	11.11	22.22
5. Coherence/clarity of module	11.11	11.11	55.56	22.22	0.00
6. Overall impression	11.11	11.11	44.44	33.33	0.00
SOCIAL STUDIES (*n* = 23)					
1. Effective writing task	4.35	4.35	34.78	8.70	47.83
2. Standards alignment	0.00	4.35	26.09	56.52	13.04
3. Fidelity to LDC instruction	4.35	4.35	26.09	34.78	30.43
4. Quality instructional strategies	4.35	4.35	13.04	39.13	30.43
5. Coherence/clarity of module	4.35	13.04	17.39	26.09	34.78
6. Overall impression	0.00	8.70	30.43	26.09	34.78
OVERALL (*n* = 76)					
1. Effective writing task	6.58	7.89	39.47	22.37	23.68
2. Standards alignment	3.95	15.79	36.84	34.21	9.21
3. Fidelity to LDC instruction	11.84	7.89	34.21	22.37	23.68
4. Quality instructional strategies	9.21	9.21	28.95	32.89	17.11
5. Coherence/clarity of module	7.89	15.79	30.26	31.58	13.16
6. Overall impression	5.26	7.89	48.68	26.32	11.84

Table F12

Descriptive Statistics for the Secondary Modules by Cohort

Dimension	Mean	Std. Dev.	Median	Mode	Minimum	Maximum
COHORT 1 RETURNING (*n* = 22)						
1. Effective writing task	3.41	1.26	3.00	3.00	1.00	5.00
2. Standards alignment	2.95	1.05	3.00	3.00	1.00	5.00
3. Fidelity to LDC instruction	3.45	1.26	3.00	3.00	1.00	5.00
4. Quality instructional strategies	3.45	0.96	4.00	4.00	1.00	5.00
5. Coherence/clarity of module	3.45	0.86	3.50	4.00	2.00	5.00
6. Overall impression	3.41	0.73	3.00	3.00	2.00	5.00
COHORT 1 NEW (*n* = 21)						
1. Effective writing task	3.33	1.11	3.00	3.00	1.00	5.00
2. Standards alignment	3.43	1.08	4.00	4.00	1.00	5.00
3. Fidelity to LDC instruction	3.19	1.47	3.00	4.00	1.00	5.00
4. Quality instructional strategies	2.90	1.61	3.00	5.00	0.00	5.00
5. Coherence/clarity of module	2.67	1.39	3.00	3.00	1.00	5.00
6. Overall impression	3.05	1.24	3.00	3.00	1.00	5.00
COHORT 2 (*n* = 33)						
1. Effective writing task	3.64	1.08	4.00	3.00	1.00	5.00
2. Standards alignment	3.42	0.83	4.00	4.00	2.00	5.00
3. Fidelity to LDC instruction	3.45	1.15	3.00	3.00	1.00	5.00
4. Quality instructional strategies	3.48	1.20	4.00	4.00	0.00	5.00
5. Coherence/clarity of module	3.42	1.15	4.00	4.00	0.00	5.00
6. Overall impression	3.42	0.90	3.00	3.00	1.00	5.00
OVERALL (*n* = 76)						
1. Effective writing task	3.49	1.14	3.00	3.00	1.00	5.00
2. Standards alignment	3.29	0.98	3.00	3.00	1.00	5.00
3. Fidelity to LDC instruction	3.38	1.26	3.00	3.00	1.00	5.00
4. Quality instructional strategies	3.32	1.28	3.50	4.00	0.00	5.00
5. Coherence/clarity of module	3.22	1.18	3.00	4.00	0.00	5.00
6. Overall impression	3.32	0.97	3.00	3.00	1.00	5.00

Table F13

Distribution (Percentage) of Ratings for the Secondary Modules by Cohort

Dimension	1	2	3	4	5
COHORT 1 RETURNING (*n* = 22)					
1. Effective writing task	9.09	9.09	40.91	13.64	27.27
2. Standards alignment	9.09	18.18	50.00	13.64	9.09
3. Fidelity to LDC instruction	9.09	9.09	36.36	18.18	27.27
4. Quality instructional strategies	4.55	9.09	31.82	45.45	9.09
5. Coherence/clarity of module	0.00	13.64	36.36	40.91	9.09
6. Overall impression	0.00	4.55	59.09	27.27	9.09
COHORT 1 NEW (*n* = 21)					
1. Effective writing task	4.76	14.29	42.86	19.05	19.05
2. Standards alignment	4.76	14.29	28.57	38.10	14.29
3. Fidelity to LDC instruction	19.05	14.29	19.05	23.81	23.81
4. Quality instructional strategies	19.05	19.05	19.05	14.29	23.81
5. Coherence/clarity of module	28.57	14.29	33.33	9.52	14.29
6. Overall impression	14.29	14.29	38.10	19.05	14.29
COHORT 2 (*n* = 33)					
1. Effective writing task	6.06	3.03	36.36	30.30	24.24
2. Standards alignment	0.00	15.15	33.33	45.45	6.06
3. Fidelity to LDC instruction	9.09	3.03	42.42	24.24	21.21
4. Quality instructional strategies	6.06	3.03	33.33	36.36	18.18
5. Coherence/clarity of module	0.00	18.18	24.24	39.39	15.15
6. Overall impression	3.03	6.06	48.48	30.30	12.12
OVERALL (*n* = 76)					
1. Effective writing task	6.58	7.89	39.47	22.37	23.68
2. Standards alignment	3.95	15.79	36.84	34.21	9.21
3. Fidelity to LDC instruction	11.84	7.89	34.21	22.37	23.68
4. Quality instructional strategies	9.21	9.21	28.95	32.89	17.11
5. Coherence/clarity of module	7.89	15.79	30.26	31.58	13.16
6. Overall impression	5.26	7.89	48.68	26.32	11.84

Table F14

Descriptive Statistics for the Exploratory Analysis of Elementary Modules

Dimension	Mean	Std. Dev.	Median	Mode	Minimum	Maximum
2016—2017 (*n* = 5)						
1. Effective writing task	4.00	1.73	5.00	5.00	1.00	5.00
2. Standards alignment	3.40	1.52	4.00	4.00	1.00	5.00
3. Fidelity to LDC instruction	2.60	1.14	3.00	3.00	1.00	4.00
4. Quality instructional strategies	3.40	1.34	4.00	4.00	2.00	5.00
5. Coherence/clarity of module	3.20	1.92	4.00	4.00	0.00	5.00
6. Overall impression	3.20	1.48	3.00	3.00	1.00	5.00
2017—2018 (*n* = 5)						
1. Effective writing task	4.20	0.84	4.00	5.00	3.00	5.00
2. Standards alignment	4.00	0.71	4.00	4.00	3.00	5.00
3. Fidelity to LDC instruction	4.00	0.71	4.00	4.00	3.00	5.00
4. Quality instructional strategies	2.80	1.10	3.00	3.00	1.00	4.00
5. Coherence/clarity of module	3.00	1.22	3.00	4.00	1.00	4.00
6. Overall impression	3.40	0.89	4.00	4.00	2.00	4.00

Table F15

Distribution (Percentage) of Ratings for the Exploratory Analysis of Elementary Modules

Dimension	1	2	3	4	5
2016—2017 (*n* = 5)					
1. Effective writing task	20.00	0.00	0.00	20.00	60.00
2. Standards alignment	20.00	0.00	20.00	40.00	20.00
3. Fidelity to LDC instruction	20.00	20.00	40.00	20.00	0.00
4. Quality instructional strategies	0.00	40.00	0.00	40.00	20.00
5. Coherence/clarity of module	20.00	0.00	20.00	40.00	20.00
6. Overall impression	0.00	0.00	40.00	20.00	20.00
2017—2018 (*n* = 5)					
1. Effective writing task	0.00	0.00	20.00	40.00	40.00
2. Standards alignment	0.00	0.00	20.00	60.00	20.00
3. Fidelity to LDC instruction	0.00	0.00	20.00	60.00	20.00
4. Quality instructional strategies	20.00	0.00	60.00	20.00	0.00
5. Coherence/clarity of module	20.00	0.00	40.00	40.00	0.00
6. Overall impression	0.00	20.00	20.00	60.00	0.00

Table F16

Descriptive Statistics for the Exploratory Analysis of Secondary Modules

Dimension	Mean	Std. Dev.	Median	Mode	Minimum	Maximum
2016—2017 (*n* = 14)						
1. Effective writing task	3.29	1.20	3.50	4.00	1.00	5.00
2. Standards alignment	3.14	1.17	3.00	3.00	1.00	5.00
3. Fidelity to LDC instruction	3.14	1.29	3.00	4.00	1.00	5.00
4. Quality instructional strategies	3.00	1.24	3.00	3.00	1.00	5.00
5. Coherence/clarity of module	2.93	1.38	3.00	3.00	1.00	5.00
6. Overall impression	3.07	1.14	3.00	3.00	1.00	5.00
2017—2018 (*n* = 14)						
1. Effective writing task	3.57	1.22	3.00	3.00	2.00	5.00
2. Standards alignment	2.93	1.14	3.00	3.00	1.00	5.00
3. Fidelity to LDC instruction	3.29	1.59	3.00	5.00	1.00	5.00
4. Quality instructional strategies	3.93	0.62	4.00	4.00	3.00	5.00
5. Coherence/clarity of module	3.79	0.80	4.00	3.00	3.00	5.00
6. Overall impression	3.64	0.84	3.00	3.00	3.00	5.00

Table F17

Distribution (Percentage) of Ratings for the Exploratory Analysis of Secondary Modules

Dimension	1	2	3	4	5
2016—2017 (*n* = 14)					
1. Effective writing task	7.14	21.43	21.43	35.71	14.29
2. Standards alignment	7.14	21.43	35.71	21.43	14.29
3. Fidelity to LDC instruction	14.29	14.29	28.57	28.57	14.29
4. Quality instructional strategies	14.29	14.29	42.86	14.29	14.29
5. Coherence/clarity of module	21.43	14.29	28.57	21.43	14.29
6. Overall impression	14.29	21.43	42.86	14.29	14.29
2017—2018 (*n* = 14)					
1. Effective writing task	0.00	21.43	35.71	7.14	35.71
2. Standards alignment	14.29	14.29	42.86	21.43	7.14
3. Fidelity to LDC instruction	21.43	7.14	28.57	7.14	35.71
4. Quality instructional strategies	0.00	0.00	21.43	64.29	14.29
5. Coherence/clarity of module	0.00	0.00	42.86	35.71	21.43
6. Overall impression	0.00	0.00	57.14	21.43	21.43

Appendix G:
Outcome Analysis Methodology

Analysis Model Specification

The specification outlined below is for middle school analyses. The elementary model is identical with two exceptions. A variable representing the average number of weeks in which a student was exposed to core class content was included in the middle school models to capture variation in that variable due to students taking extra core science content. Additionally, the middle school models include two dummy variables (one for grade 7 and one for grade 8), while the elementary school model only required one dummy variable (grade 5).

For our outcome analyses, we used a threshold of $p < .05$ to determine whether there was a statistically significant impact of LDC on ELA achievement. In addition to the LDC treatment indicator, a teacher effect for years of experience was included, as well as an aggregate indicator measuring the mean prior performance of each student's classroom peers. The fixed effects also included student characteristics to identify the matched comparison sample of students, such as baseline achievement, socioeconomic status, demographics, language proficiency, grade level, and participation in special education.

The three-level MMMC model was used to estimate the impacts of the LDC intervention on student learning. This same analytic model will be used to estimate impacts in future years. The general specification for the middle school level MMMC model is shown in the following equation using similar notation proposed by Browne et al. (2001, equation 6) and applied in Tranmer, Steel, and Browne (2014, equation 3).

$$y_i = x_i'\beta + u^{(3)}_{School(i)} \sum_{j \in Teacher(i)} w_{i,j} u^{(2)}_j + e_i$$

$$\mathrm{i} = 1, \ldots, \mathrm{n}\ \ \mathrm{Teacher(i)} \subset (1, \ldots, \mathrm{J})$$

$$u^{(3)}_{School(i)} \sim \mathrm{N}\left(0, \sigma^2_{u(2)}\right), u^{(2)}_j \sim \mathrm{N}\left(0, \sigma^2_{u(2)}\right), e_i \sim \mathrm{N}(0, \sigma^2_e)$$

In this model y_i is the student achievement score response, X_i is a vector of the fixed covariates and β is the vector of the corresponding fixed effects. $School(i)$ is the school which student i attends, thus the term $u^{(3)}_{School(i)}$ represents the random effects for that level of classification. Within the term $\sum_{j \in Teacher(i)} w_{i,j} u^{(2)}_j$, $u^{(2)}_j$ is the set of j random effects for the teachers included in the selected dataset, and $w_{i,j}$ is the weight which sums to 1 for each student applied in proportion to the instruction time assigned with each teacher. The following presents an example of the full model middle school specification.

$$achievement_i = \beta_0 + LDC_i * \beta_1 + priorELA_i * \beta_2 + priorMath_i * \beta_3 + Female_i * \beta_4 + LEP_i * \beta_5 + SES_i * \beta_6 + Black_i * \beta_7 + Hispanic_i * \beta_8 + Asian_i * \beta_{10} + OtherEth_i * \beta_{11} + SPED_i * \beta_{12} + Grade7_i * \beta_{13} + Grade8_i * \beta_{14} + priorClassELA_i * \beta_{15} + TeachExp_i * \beta_{16} + ContentExpWeeks_i * \beta_{17} + u^{(3)}_{School(i)} \sum_{j \in Teacher(i)} w_{i,j} u^{(2)}_j + e_i$$

$$u^{(3)}_{School(i)} \sim \mathrm{N}(0, \sigma^2_{u(3)}), u^{(2)}_j \sim \mathrm{N}(0, \sigma^2_{u(2)}), e_i \sim \mathrm{N}(0, \sigma^2_e)$$

In this model, $achievement_i$ is the standardized ELA outcome score for student i; In the dosage-dependent model LDC_i is the proportion of core class instruction time taken with an LDC teacher (ranges 0–1); In the dosage-independent model LDC_i is coded as zero for comparison students and as 1 for students receiving any level of LDC teacher exposure.

$Female_i$, $LEP_i, Black_i, Hispanic_{i,}, Asian_{i,}, OtherEth_{i,}\ SPED_i, SES_i, Grade7_i, Grade8_i$ are student demographic indicators coded 1 if the status is present and 0 if absent; white students serve as the reference group for the race/ethnicity variables, and grade level 6 is the reference group for grade level;

$priorELA_i$, and $priorMath_i$ are standardized student achievement scores from the prior year;

$priorClassELA_i$ is the aggregated mean of the prior ELA scores for all the core class peers of student i;

$TeachExp_i$ is the aggregated percentage of the years of teaching experience less than 3 for those teachers which student i was exposed to in her core classes;

$ContentExpWeeks_i$ is the average number of weeks in which student i was exposed to in her core classes;

β_1 is the impact of LDC, the treatment;

β_{12} is the average difference between Cohort 1 and Cohort 2;

β_2 & β_3 are the effects of the prior score covariates;

β_4 … β_{14} are the effects of the demographic covariates;

β_{15}& β_{16} are the effects of the aggregated class level covariates

$u^{(3)}_{School(i)}$, $u^{(2)}_j$, e_i are the error components at the school, teacher, and student level respectively assumed to all have mean 0 and variance, $\sigma^2_{u(2)}, \sigma^2_{u(3)}, \sigma^2_e$ respectively.

Student/Teacher Course Exposure Weighting

Tables G1 and G2 demonstrate how the process of calculating general MMMC teacher weights and LDC treatment weights (for the dosage modeling approach) was conducted respectively for elementary and middle school. In elementary school, in the event that a student was exposed to more than one teacher, each content area was given equal weight in distributing teacher/student exposure. For example, if a student was enrolled for both ELA and social studies/history under one teacher, then that teacher was coded as .67 for having contributed to two thirds of the students' core curriculum exposure. If the same student enrolled in science with a different teacher than the one who was linked to their course marks in ELA and social studies/history, then that science teacher would have been coded as .33 and all other teachers in the sample would have been coded as zero. This would then result in the student's exposure adding to a unity (1).

Table G1

Example of Elementary School Student/Teacher Weighting Based on Course Links

Marking Period	Example student/teacher weighting for use in MMMC (Weight=Marking Period/Total Marking Period3)	Example LDC treatment dosage weight
One	Student enrolled with an intervention Teacher: Weight=(1/3)=0.333	Weight=.333
Two	Student enrolled with an intervention Teacher: Weight=(1/3)=0.333	Weight=.333
Three	Student enrolled with a non-intervention teacher: Weight=(1/3)=0.333	Weight=.0
Total	Unity: for every student the student/teacher weights sum to 1	Treatment Weight=.667

Note. In the selected samples for these analyses, core content courses within each marking period were taught by a single teacher.

Table G2

Example of Middle School Student/Teacher Weighting Based on Course Mark Links

Core content area	Course name	Example student/teacher weighting for use in MMMC (Weight=Subject Days/Total Days)	Example LDC treatment dosage weight
ELA	English 7A & 7B	Student enrolled two terms of core ELA (grade 7) with an intervention teacher: Weight=2/5=0.400	Weight=.400
Social studies	Social Studies WHG: ANC CIV & B	Student enrolled two terms of core social studies (grade 7) with a non-intervention teacher: Weight=2/5=0.400	Weight=.0
Science	Science 7	Student enrolled one terms of core science (grade 7) with a non-intervention teacher: Weight=1/5=0.200	Weight=.0
Total		Unity: for every student the student/teacher weights sum to 1	Treatment Weight=.400

Note. "Days" refers to core content enrolled days preceding the NYS assessment date.

In middle school, students' exposure to teachers at the course level in the three core content areas was coded in the same manner as in the elementary grades based on enrolled time preceding the assessment period. A difference in our middle school coding process was that we did not force each core content area into equal weighting. Instead each core content area exposure contributed to a core content area total sum which formed the basis from which the weights were proportioned.

Most commonly a student had equivalent days of core instruction exposure in each of the three content areas (often 215 days in each content area). In that scenario, if a student had exposure to three different teachers, then each teacher would contribute one third (.33) of the overall core curriculum exposure and all other teachers in the sample would be coded as zero. However, in addition to the typical core science course, extra core science courses were also included in the LDC analysis (for example a Grade 8 student taking biology), which made it possible then for a student to accumulate more units in science than in the other two content areas.

The weighting in middle school was always distributed as a proportion of the total exposure days in the three content areas. Therefore, if a student accumulated 300 science days (across two courses), 200 social studies days, and 200 ELA days, the base number of instruction days would be 700 days. If, using that same scenario, the same teacher taught both the typical core and biology courses then that teacher would contribute three-sevenths (.43) of the overall

core curriculum exposure with the social studies and science teachers contributing two-sevenths (.285) each, again resulting in the student's exposure adding to a unity (1).

Calculation of Effect Size

We calculated student-level effect sizes according to the WWC 3.0 criteria. Specifically, for the impact analysis with treatment status as a dichotomous variable, we calculated Hedges' *g,* the difference in adjusted mean outcomes for the groups divided by the unadjusted pooled within-group standard deviation of the outcome measure in the sample, for all outcomes. The difference in adjusted mean outcomes is estimated by β_1 in the models defined above, as outlined in the WWC standards handbook for computing effect sizes in multi-level frameworks. Specifically,

$$g = \frac{\omega\gamma}{\sqrt{\frac{(n_i - 1)s_i^2 + (n_c - 1)s_c^2}{n_i + n_c - 2}}}$$

where γ is β_1 which is the coefficient from the MMMC for the intervention effect.

Note that in our analyses the outcome measure is standardized within the analytical sample (mean=0, standard deviation=1). As a result, we expected that g would likely be quite similar to the β_1 coefficient from the MMMC Model in the large samples we plan to collect later in the study.

Though it is not standard to use g with a continuous treatment effect, as in the case of our dosage-dependent treatment measure, we have defined and matched populations n_i and n_c where treated students (n_i) could have any positive treatment value<=1, and control students (n_c) had a treatment value of zero. We could therefore calculate *g* in the case of our dosage-dependent treatment measure, and again expect that it would not differ substantially from the β_1 coefficient. It is crucial, however, to note that *g* and β_1 in the dosage-dependent models reflect the effect size projected for a student who would receive exposure to intervention teachers in all of their core classes. Along with this effect we report average dosage received by treated students so that the average treatment effect on treated students could be calculated.

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