LDC: Evidence of Impact

As of March 2017

Evidence of Impact

LDC's evidence includes both quantitative and qualitative evidence demonstrating our impact on improving the teacher skills necessary to improve student outcomes. We also have both quantitative and qualitative data validating LDC's impact on student outcomes. The data falls into five categories:

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Introduction

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Teacher skill development is predicated on decades old research that "task predicts performance" and that effective implementation of standards in the classroom leads to improved student outcomes (Elmore, 2010). LDC thus builds teacher classroom skills in ways that are measured.

LDC provides teachers with a process to design and implement assignments that are hardwired to help students master the skills needed to engage with complex, discipline-specific content. Teachers use LDC's templates to create text-dependent writing tasks and backward-mapped instructional plans that develop the skills students need to write meaningfully about complex texts. The LDC process then supports teachers in using the SCALE-developed student work rubrics to determine whether students are mastering the standards through their LDC assignment.[1] The student work rubric was designed by SCALE (Smarter Balanced performance task advisors) after years of field research and testing. Teachers can use the rubric-based student writing scores generated by that instruction as a diagnostic directly linked to specific instructional standards both before and after the learning process. As a result, SCALE's generalizability study confirmed that curriculum-embedded assessments created through the LDC design process provide rich evidence of whether instruction is sufficiently scaffolded to drive student learning to college ready standards—and whether students are on track to college and career (and SBAC/PARCC) success.[2]

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[1] Wei, R.W., & Cor, K. Assessing What Matters.
[2] Ibid

1) Teacher Survey Data

Independent researchers and LDC have been conducting rigorous teacher surveys every year since 2011, yielding a rich and remarkably consistent confirmation of LDC's success in improving student outcomes and improving teacher skills.

Survey research includes:

1.	Research for Action teacher surveys	(2010–12)
2.	CRESST (UCLA) i3 teacher surveys	(2015–16)
3.	LDC annual teacher surveys	(2014–16)
4.	Denver School District teacher surveys	(2015–16)
5.	SREB 4 state teacher surveys	(2015–16)
6.	CRESST i3 teacher surveys	(2016–17) *(Availability: Nov. 17)*

I.   Research for Action

The 2012 Research for Action's independent surveys of 1,600 teachers revealed:

- 84% reported that LDC is effective in increasing rigor of writing assignments.
- 92% found LDC effective in promoting literacy skills in science and social studies classrooms.
- 87% found LDC effective in supporting their students' college readiness[3].

Research on LDC

In a study of 1600 teachers, Research for Action found:

84% reported that LDC is effective in increasing rigor of writing assignments.

92% found LDC effective in promoting literacy skills in science and social studies classrooms.

87% found LDC effective in supporting students' college readiness.

Levin, S. and Poglinco. S. "Scale-Up and Sustainability Study of the LDC and MDC Initiatives" Philadelphia: Research for Action. September 2013.

These strong teacher survey results were yielded long before the LDC organization implemented years of field research to develop quality assurance mechanisms in professional development delivery and a host of other resources to improve the ease and impact of learning to deliver college ready standards-driven lessons.

II.   CRESST (UCLA)

The National Center for Research on Evaluation, Standards and Student Testing at UCLA (CRESST)'s qualified educational design study in LDC's i3 Validation grant will not yield valid quantitative results for at least another year. However, their 2016 teacher survey data continues to confirm LDC improves teacher skills and student outcomes:

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[3] Research for Action, Scale-Up and Sustainability Study of the LDC and MDC Initiatives (Sept 2013)

Teacher Skill Development:

- **88% improved in developing instructional plans** and
- **82% improved in constructing prompts, identifying assignments, and assessing student learning** to revise instruction.

All courses have been considerably strengthened since last year's beta pilot in terms of both user friendliness (navigation, user interface) and content.

Student Achievement Increases:

A vast majority of teachers confirmed that LDC had a variety of positive impacts on student learning:

- **94%** stated LDC **improved student's content knowledge**.
- **88%** reported an impact on **students** developing grade level **reading skills**.
- Positive impacts also were noted for **improving student writing** for completing a culminating writing task, quality of writing, and **college and career readiness skills (83%)**
- Teachers were less likely to report (76%) impact on students' capacity to analyze a task and on students' speaking and listening skills.

III.   LDC Annual Surveys
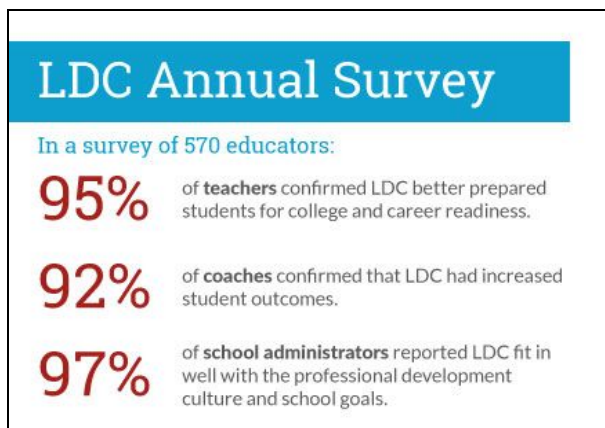
In keeping with LDC's commitment to continuous learning and teacher input, since our launch at the beginning of 2014, LDC has annually surveyed teachers on whether and how our free tools and resources support teacher learning and improve student achievement. These annual anonymous educator (teachers, coaches, administrators) surveys on LDC's impact and agency in the most recent year (2015–2016) reflect equally positive outcomes:

Background

- N=570 for one or more parts but for most questions N=160-200.
- 49% had taught LDC 0-1 year and another 19% had taught for 2 years.

Teachers:
- 88% of teachers confirmed that LDC had increased student outcomes (State Exams).
- 95% of teachers confirmed LDC better prepared students for college and career readiness.
- 93% of teachers confirmed that LDC's online platform helped develop their instructional skills.
- 95% reported it enabled them to align assignments to standards and student learning objectives.
- 93% develop quality instructional plans that students need.
- 83% of teachers (N=127) confirmed that LDC's online courses helped them design standards
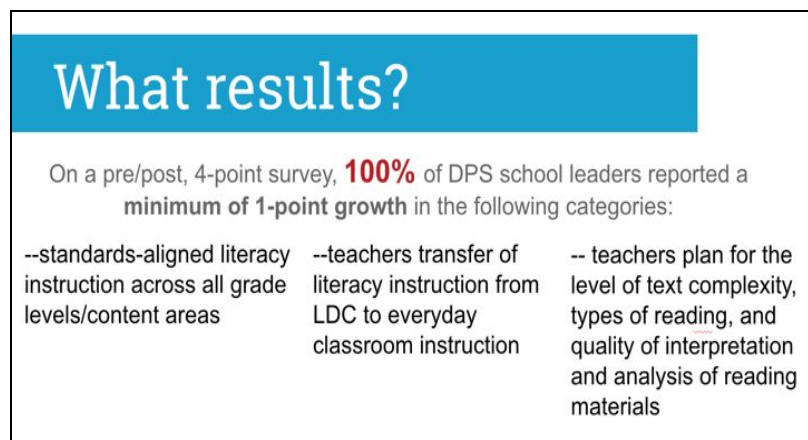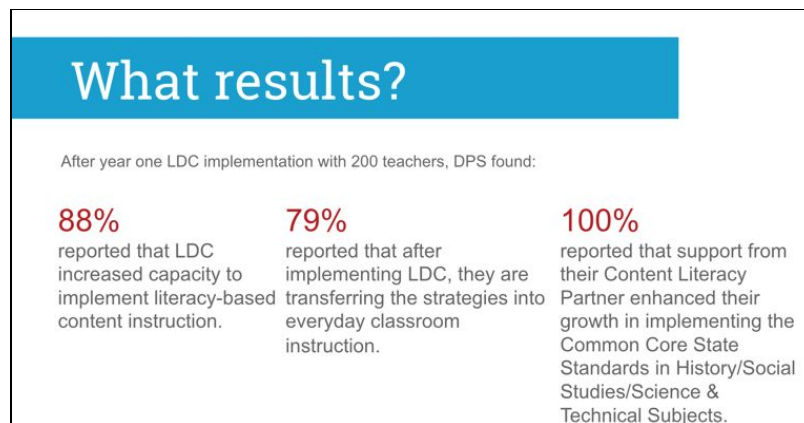
aligned assignments.

<u>Coaches:</u>
- 94% of coaches reported it had a "positive impact" on them.
- 92% of coaches confirmed that LDC had increased student outcomes.

<u>Administrators:</u>
- 93% of school administrators confirmed that LDC had increased student outcomes.
- 97% of school administrators reported LDC fit in well with the professional development culture and school goals.
- 90% of school administrators stated LDC "clearly impact[ed]" teacher professional growth.

## IV.   District-Wide Teacher Survey: Sample Site: Denver Public Schools

Denver Public Schools used LDC sporadically for several years. In 2014–2015, Denver requested that LDC work with the central office and recruited classroom teachers to create and transform their central task collection into high quality performance tasks that could be shared district-wide. The voluntary adoption in the first year was so successful, 49 secondary schools and 30,000+ students were engaged in using LDC modules in the second year (with 100% of Year 1 schools returning). Denver surveyed Year 1 teachers with the following powerful results for student outcomes:

What results?

After year one LDC implementation with 200 teachers, DPS found:

88%
reported that LDC increased capacity to implement literacy-based content instruction.

79%
reported that after implementing LDC, they are transferring the strategies into everyday classroom instruction.

100%
reported that support from their Content Literacy Partner enhanced their growth in implementing the Common Core State Standards in History/Social Studies/Science & Technical Subjects.

What results?

On a pre/post, 4-point survey, **100%** of DPS school leaders reported a **minimum of 1-point growth** in the following categories:

--standards-aligned literacy instruction across all grade levels/content areas

--teachers transfer of literacy instruction from LDC to everyday classroom instruction

-- teachers plan for the level of text complexity, types of reading, and quality of interpretation and analysis of reading materials
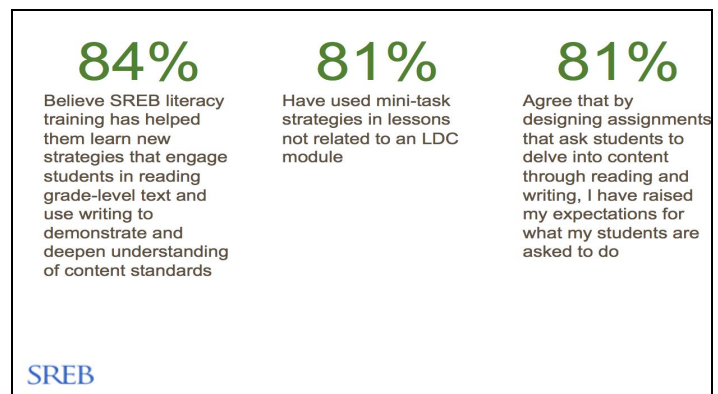
V.   SREB Multi-State Teacher Surveys

The Southern Regional Education Board (SREB) conducted a survey of 607 teachers and 1794 students in 43 schools across four states in the 2015–16 School Year.[4] SREB then compared responses from LDC-trained teachers to teachers who did not use LDC in their classrooms. Significantly, students in LDC classrooms reported far more rigorous text-based instruction and student work than non-LDC classrooms.

- The High School Survey had 793 student respondents from 18 Schools (ELA – 258, Science – 195, Social Studies – 189, CTE – 150)
- The Middle School Survey had 1001 student responses from 25 schools (ELA – 520, Science – 240, Social Studies – 39, CTE – 202)
- LDC Teachers Survey: N = 607 from 4 states (AL, MS, NC, TX) (N=~43)
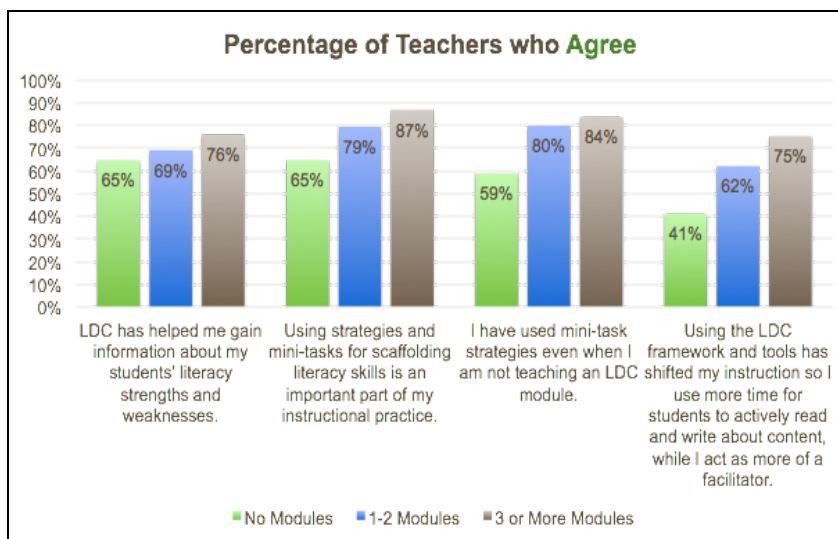
First, SREB corroborated that the more teachers engaged with modules, the more likely they were to use literacy strategies outside of modules and to have students actively read and write about content—i.e. throughout the year. LDC is about regular, good, daily instruction, not teaching two modules a year.

Over 80% found that after only one year (the pilot) the program had improved teachers' ability to deliver instructional strategies that "deepened students understanding of content standards." This in turn had raised their expectations for what texts and writing their students could handle.

84% Believe SREB literacy training has helped them learn new strategies that engage students in reading grade-level text and use writing to demonstrate and deepen understanding of content standards

81% Have used mini-task strategies in lessons not related to an LDC module

81% Agree that by designing assignments that ask students to delve into content through reading and writing, I have raised my expectations for what my students are asked to do

SREB

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[4] LDC is SREB's only literacy training so references to "SREB training" are to LDC training.

Students, in turn, reported that they engaged in far more rigorous and repeated tasks involving textual analysis and writing—the kind of tasks research demonstrates improves student outcomes.[5]
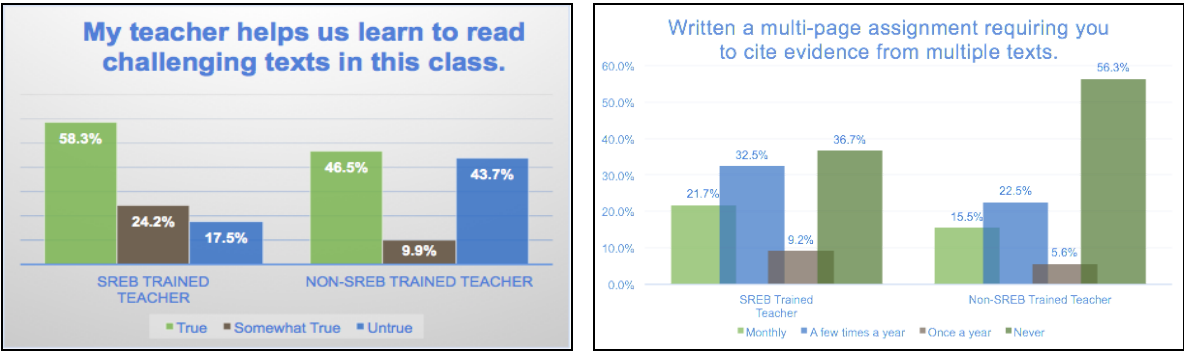
These results maintained even when the students were high school CTE or non-Honors middle school students:
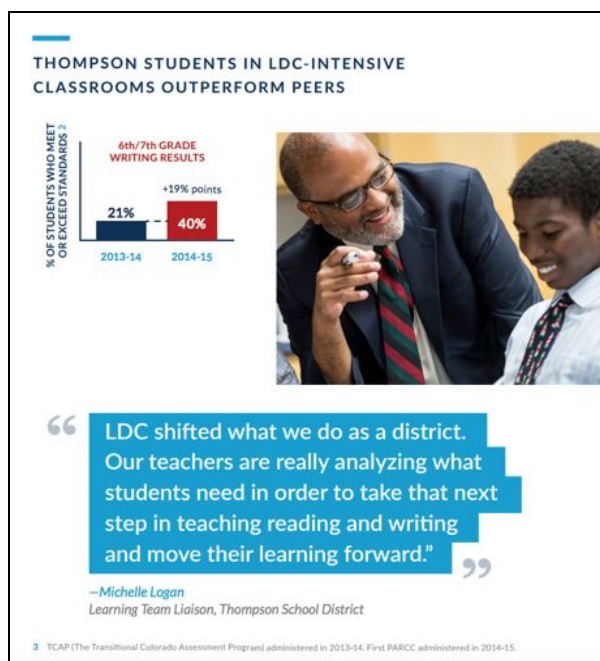

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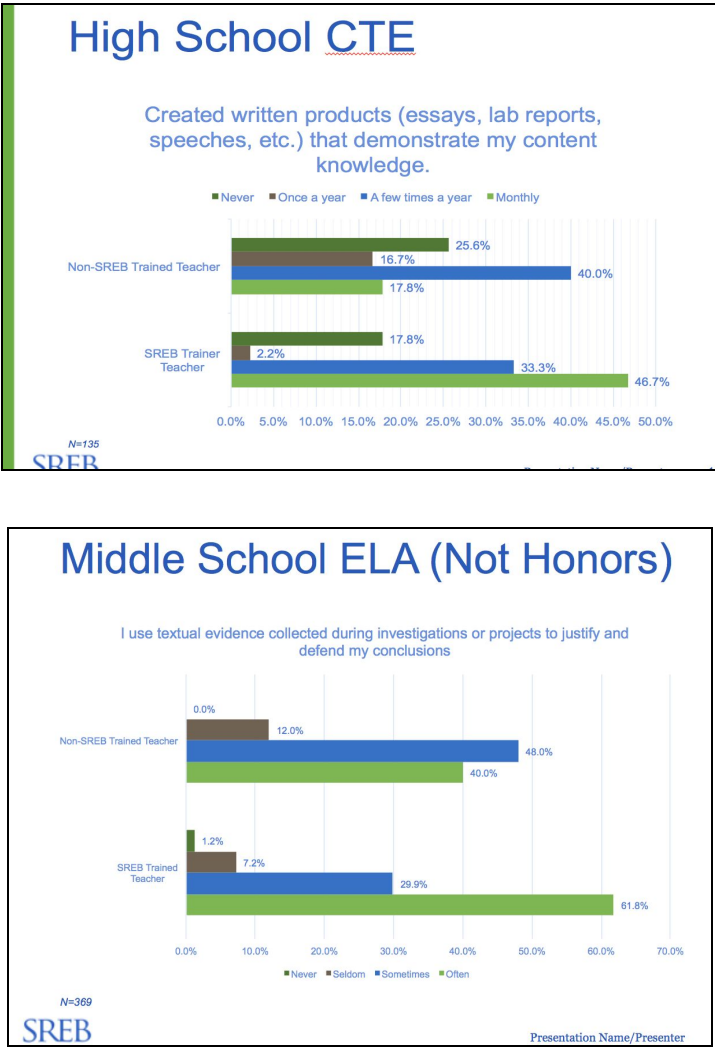
[5] Richard Elmore, *In Conversation: Leading the Instructional Core*, Summer 2010 – Vol. 11 Issue 3, page 6; citing prior research by Walter Doyle, Fred Newmann, and the Chicago Research Consortium (T. Bryk); Santelises, S.B., & Dabrowski, J. (Sept. 2015). *Checking In: Do Classroom Assignments Reflect Today's Higher Standards?* The Education Trust.

In short, even students identified as 'less advantaged' experienced the benefit of more rigorous instruction due to LDC training of teachers. (See student video)

2) **Quantitative Research Data**

Research conducted by independent academic research institutions, individual districts, and partner organizations has also resulted in numerous quantitative confirmations of LDC's impact both in K–12 and beyond for college readiness.

CRESST: Early independent research on LDC's impact on student outcomes found a statistically significant increase in student outcomes after only one year of LDC implementation.[6] In Kentucky, CRESST compared state assessment data of LDC students to that of non-LDC students.[7] CRESST reported that the LDC treatment had a statistically significant positive effect on the reading achievement of all students participating in the study, with a particularly positive impact on students with free/reduced lunch status. This positive impact on student outcomes occurred despite the minimal one-year treatment. In all three study sites (Kentucky, Pennsylvania, and Florida), teachers reported that LDC provided an effective means of monitoring and formatively assessing student work to accelerate their students' learning development.[8]
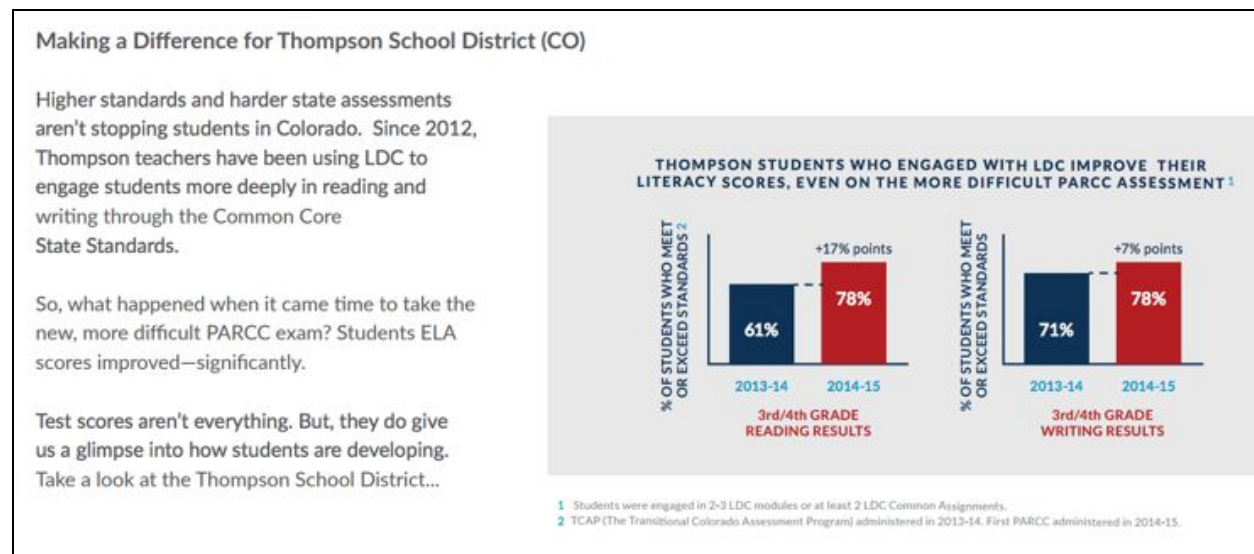

THOMPSON STUDENTS IN LDC-INTENSIVE CLASSROOMS OUTPERFORM PEERS

6th/7th GRADE WRITING RESULTS

% OF STUDENTS WHO MEET OR EXCEED STANDARDS 2

+19% points

21% 2013-14 — 40% 2014-15

"LDC shifted what we do as a district. Our teachers are really analyzing what students need in order to take that next step in teaching reading and writing and move their learning forward."

—Michelle Logan
Learning Team Liaison, Thompson School District

3 TCAP (The Transitional Colorado Assessment Program) administered in 2013-14. First PARCC administered in 2014-15.

School District Research: Numerous other quantitative studies have been conducted around the country with less formalized procedures. For example, the Thompson School District in Colorado collected student achievement data across the district, isolating within individual schools which teachers learned and taught LDC compared to those who had not. By comparing LDC teachers in schools against both district non-LDC and statewide averages, Thompson confirmed that LDC had a statistically significant impact on improving student achievement (see below for raw numbers).

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[6] Herman, J. and Epstein, F. *Supporting Middle School Content Teachers Transition to the Common Core: The Implementation and Effects of LDC,* California: CRESST. 2014.

[7] 2,200 students taught by 37 teachers implementing LDC and between 12,000 and 19,000 control students depending on the outcome measure. Their analysis drew comparison students from schools and districts throughout the state, controlling for student demographics, student prior performance, teacher prior effectiveness, and school prior effectiveness.

[8] Quantitative data was only readily available in Kentucky.

Making a Difference for Thompson School District (CO)

Higher standards and harder state assessments aren't stopping students in Colorado. Since 2012, Thompson teachers have been using LDC to engage students more deeply in reading and writing through the Common Core State Standards.

So, what happened when it came time to take the new, more difficult PARCC exam? Students ELA scores improved—significantly.

Test scores aren't everything. But, they do give us a glimpse into how students are developing. Take a look at the Thompson School District...

THOMPSON STUDENTS WHO ENGAGED WITH LDC IMPROVE THEIR LITERACY SCORES, EVEN ON THE MORE DIFFICULT PARCC ASSESSMENT [1]

% OF STUDENTS WHO MEET OR EXCEED STANDARDS [2]

+17% points — 61% (2013-14), 78% (2014-15) — 3rd/4th GRADE READING RESULTS

% OF STUDENTS WHO MEET OR EXCEED STANDARDS

+7% points — 71% (2013-14), 78% (2014-15) — 3rd/4th GRADE WRITING RESULTS

1 Students were engaged in 2-3 LDC modules or at least 2 LDC Common Assignments.
2 TCAP (The Transitional Colorado Assessment Program) administered in 2013-14. First PARCC administered in 2014-15.

Thompson LDC, TCAP, and PARCC District Comparison Data 2013-2015

		ELA05					
School	#Students	Did Not Meet	Partially Met	Approached	Met	Exceeded	Met + Exceeded
LDC Cohort	60	7	5	23	52	13	65
LDC Cohort	63	11	16	22	43	8	51
LDC Cohort	66	9	15	29	44	3	47
LDC Cohort	38	8	16	26	37	13	50
District	1064	9	16	29	40	6	46
State	X	11	20	28	37	3	40
PARCC	X	10	20	29	37	3	40

		ELA07					
		50+ students opted out of testing at first school					
School	#Students	Did Not Meet	Partially Met	Approached	Met	Exceeded	Met + Exceeded
CAS	231	17	18	22	29	13	42
CAS	152	13	19	29	30	9	39
CAS	183	16	18	29	25	11	36
Non CAS	163	30	18	26	21	4	25

		ELA10					
		Large percentage of students opted out of testing throughout district					
School	#Students	Did Not Meet	Partially Met	Approached	Met	Exceeded	Met + Exceeded
CAS	88	26	18	15	31	10	41
District	472	30	21	21	21	7	28
State	X	23	18	21	27	10	37
PARCC	X	23	18	21	27	10	37

To further validate this research, LDC has contracted with a researcher from the Consortium for Policy Research in Education (CPRE) at the University of Pennsylvania to work with Thompson School District to ensure the data collection and analysis meets standards for valid research. Other examples of school district data collections that are also being reviewed for correlational validation by our CPRE researcher include:

Achievement Growth in Content Areas:
Examples: East Ridge Middle School, FL, and Palmyra Area High School, PA.

Making a Difference at East Ridge Middle School (FL)

Located just west of Orlando, East Ridge Middle School is large and diverse; more than 50% of students receive free or reduced lunch. Educators at East Ridge are committed to innovation and they have been immersing students in LDC since 2014.

Subject area teachers use LDC mini-tasks throughout the year. Expert teachers engage students in LDC mini-modules two times per month. Teachers have 18 full days for collaboration with colleagues, using LDC tools to look at student work and their own teaching.

The results? Improved student achievement and recognition for their work: East Ridge Middle School earned an "A"—up from a "B"— on their most recent Florida school report card.

LDC CONTRIBUTES TO STUDENT ACHIEVEMENT IN CONTENT AREAS

CIVICS: % OF 7TH-GRADE STUDENTS PROFICIENT [2]
- 2013-14: 51%
- 2014-15: 71% (+20% points)

SCIENCE: % OF 8TH-GRADE STUDENTS PROFICIENT [1]
- 2013-14: 52%
- 2014-15: 61% (+9% points)

1 2014-15 Florida Comprehensive Assessment Test. Students tested in 5th and 8th grades.
2 2014-15 Florida End-of-Course Assessment in Civics for 7th grade.

Making a Difference at Palmyra Area High School (PA)

Want to hear something impressive? Palmyra Area High School has posted steady student achievement gains on state assessments since beginning LDC in 2011-2012.

The numbers are one thing. What's more impressive is what students are doing. Palmyra students start LDC in sixth grade. By ninth grade they know how to annotate, outline, and cite texts, and they have developed the literacy habits and stamina for working on complex assignments over time.

High school teachers build on these skills, focusing on higher level literacy and critical thinking in all content areas so that students are prepared for advanced courses.
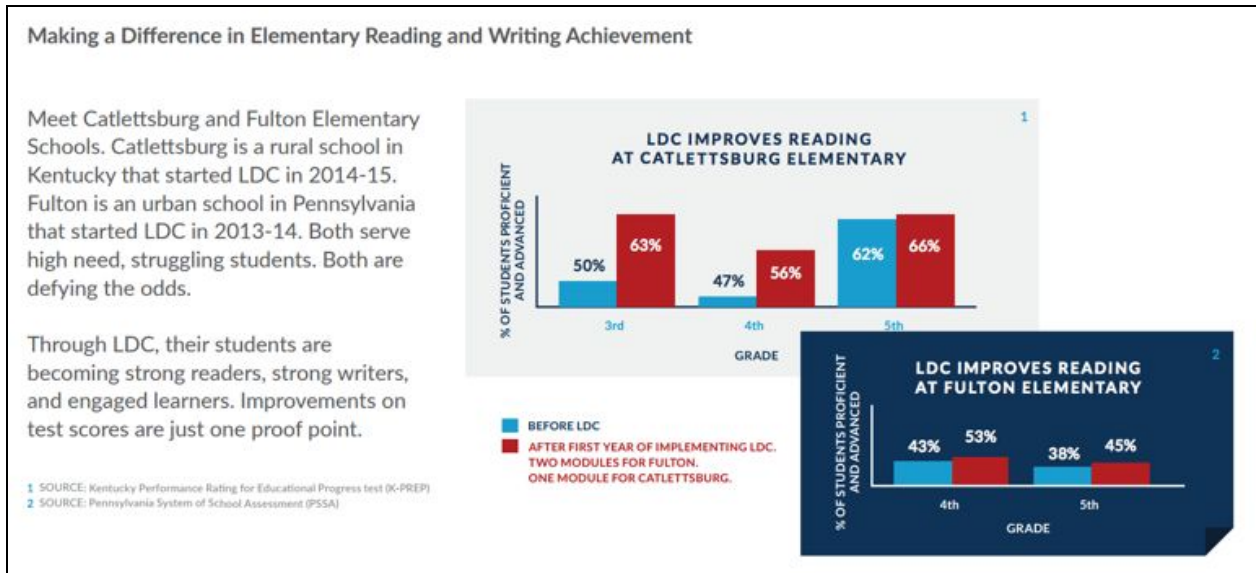
Now, that's impressive.

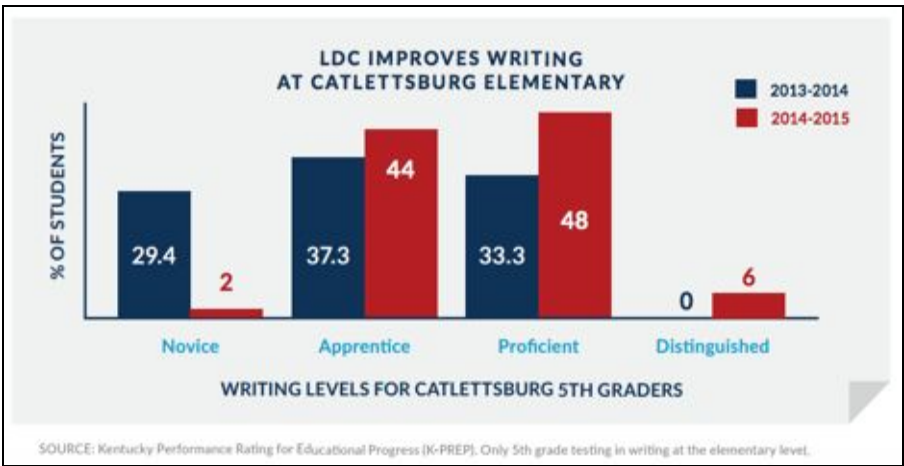**LDC CONTRIBUTES TO STUDENT ACHIEVEMENT IN CONTENT-AREA LITERACY [1]**

BIOLOGY RESULTS
- Class of 2014: 67%
- Class of 2015: 76% (+9% points)
- Class of 2016: 90.6% (+14.6% points)

% OF 11TH GRADERS PROFICIENT OR ADVANCED [2]

READING RESULTS
- Class of 2014: 84%
- Class of 2015: 87.6% (+3.6% points)
- Class of 2016: 93.6% (+6% points)

% OF 11TH GRADERS PROFICIENT OR ADVANCED [2]

1 Palmyra Area High School students engage in one LDC module in Science, Social Studies and ELA each year. Depending on their electives, they might also participate in other LDC modules as well.
2 Pennsylvania Keystone Exams.

Reading and Writing Scores at Elementary Schools in Kentucky and Pennsylvania

Making a Difference in Elementary Reading and Writing Achievement

Meet Catlettsburg and Fulton Elementary Schools. Catlettsburg is a rural school in Kentucky that started LDC in 2014-15. Fulton is an urban school in Pennsylvania that started LDC in 2013-14. Both serve high need, struggling students. Both are defying the odds.

Through LDC, their students are becoming strong readers, strong writers, and engaged learners. Improvements on test scores are just one proof point.

1 SOURCE: Kentucky Performance Rating for Educational Progress test (K-PREP)
2 SOURCE: Pennsylvania System of School Assessment (PSSA)

85% of Catlettsburg's teachers are active LDC CoreTools users.

Writing Scores at Helen Cox High Schools in Louisiana
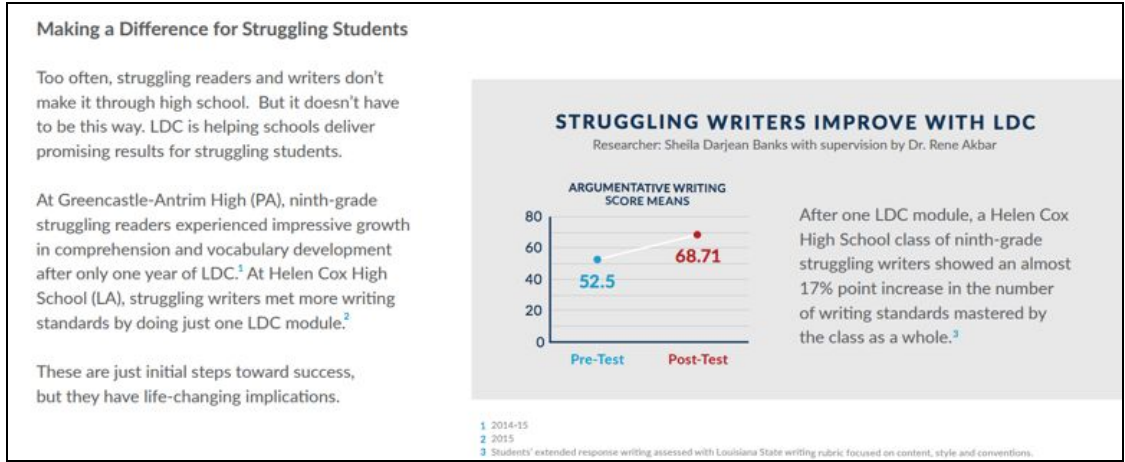
SREB Multi-State Data Collection: College ready data likewise supports LDC's powerful impact. For example, last year SREB launched its Literacy Ready curricula in sites across the country using eight LDC modules to anchor a year-long curriculum for high school seniors. The aim of the Literacy Ready curricula was to improve students' ACT scores to avoid remedial non-credit bearing college courses (generally students below the 16–19 ACT range require college remediation). The outcome after just one year of LDC was statistically significant improvements in almost every ACT test score for students.[9]

Table 1: ACT Results of Literacy Ready Students

ACT Exam	Average ACT Score Before Literacy Ready (2015)	Average ACT Score After Literacy Ready (2016)	Percentage of Students Who Improved	Is the improvement statistically significant?
English	14.4	15.1	51	yes
Reading	16.5	16.3	45	no
Science	16.8	17.7	53	yes
Composite	16.0	16.6	50	yes

Table 2: Average Gains Among Literacy Ready Students Who Improved Their ACT Scores

ACT Exam	Average ACT Score Before Literacy Ready (2015)	Average ACT Score After Literacy Ready (2016)	Average Improvement on ACT Score
English	13.8	16.8	3.0
Reading	15.4	18.2	2.8
Science	15.7	19.3	3.6
Composite	15.6	17.8	2.2

K–12 Data Collection: SREB has also collected student achievement data from 18 other sites around the country with deep LDC implementations with sterling results. The full set of data collection studies is linked here but two examples:

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[9] The study is currently being published by SREB.

Pine Forest High School, FL: Principal Frank Murphy noted LDC's powerful impact across grade levels and content areas. LDC's focus on content literacy resulted in schoolwide measurable gains on a variety of assessments, including the Florida Biology Comprehensive Assessment Test, where the school's scores went up by 13 points, and their Postsecondary Education Readiness Test (P.E.R.T.), where the school's scores increased from 53% to 67%.

Percentages of Students Meeting or Exceeding Standards on Florida's Biology End-of-Course Assessment

	2011-2012	2012-2013
Pine Forest High School	48%	61%
State of Florida	59	59

Source: Florida Comprehensive Assessment Test (FCAT), 2012-2013 school year

Eddy Middle School, GA: After a year of LDC implementation, the percentage of students who passed the Criterion Referenced Competency Test (CRCT) increased significantly; after two years, 98% of EMS students passed the eighth-grade ELA CRCT.

Percentages of All EMS Students Passing the Administered Criterion Referenced Competency Test (CRCT) from 2011 – 2013

	2010-2011	2011-2012 (YEAR ONE OF LDC)	2012-2013 (YEAR TWO OF LDC)
Sixth-grade reading	79%	85%	86%
Sixth-grade English/language arts	76	74	85
Sixth-grade social studies	50	67	70
Seventh-grade social studies	47	67	70
Eighth-grade English/language arts	85	94	98
Eighth-grade social studies	47	48	70

After beginning work with SREB and LDC in 2012, **Letcher County Central High School (KY):**

- Increased its overall accountability score from 47 to 60 in 2013, surpassing its Annual Measurable Objective by 12 points
- Moved from a 15 percentile ranking to a 76 percentile ranking on the Kentucky School Report Card
- Was reclassified from "Needs Improvement" in 2011–2012 to "Proficient/Progressing" in 2012–2013.

3) Research Validating LDC's Quality Assurance and Calibration Systems

Recently, the Stanford Center for Assessment, Learning & Equity (SCALE) concluded: "Clearly, using [LDC's] instructionally embedded assessments has important benefits for teachers and students, and there is little doubt that a focus on such assessments would be an effective instructional improvement strategy."[10] Given the strong research basis for LDC, the United States Department of Education (USDOE) awarded LDC an Investing in Innovation (i3) Validation grant in December 2014 to support training thousands of teachers in New York City and Los Angeles school districts to use LDC's tools and instructional design system.

## 4) Teacher and Coach Competency Progress Data-Monitoring

LDC's SCALE-designed quality review systems deliver a uniquely rigorous, evidence-based process and product in the marketplace. LDC work results in a tangible, measurable artifact that provides multiple

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[10] Wei, R.W., & Cor, K. Assessing What Matters: Literacy Design Collaborative (LDC) Writing Tasks as Measures of Student Learning. Stanford Center for Assessment, Learning & Equity, July 2015. (p. 35).

data points related to an author's (either a teacher or a coach) growth and acquisition of the 20 enduring LDC Teacher Competencies, which align with Danielson and local district teacher effectiveness skills, as well as National Board's Propositions and skills of accomplished practice. A calibrated, peer reviewed LDC module contains powerful evidence of exactly which of those 20 skills the educator-author has acquired and multiple modules demonstrate growth in mastery of those skills.

The rigor of the SCALE quality vetting process, the clear ways the artifact demonstrates teacher skill, and the ways in which LDC can track progress between artifacts means that LDC has a rare assessment—a work-embedded teacher assessment that can be used formatively and summatively to assess teacher expertise and growth. That teachers and coaches produce this artifact while doing their work—writing instructional plans—means that the process of writing the module is professionally enriching and immediately relevant and useful. The creation of an artifact shows evidence of teacher learning and increasing expertise means that the coaches and administrators supporting teachers—as well as teachers themselves—can gauge teacher progress and the efficacy of their own support of those teachers. Thus, the LDC module artifact becomes not just a barometer of teacher expertise, but also one of (coach) support efficacy. Finally, school leaders, professional development providers, and system leaders can see exactly how effective their support of teachers has been and whether their investment in professional development is resulting in actual changes in teacher skill.
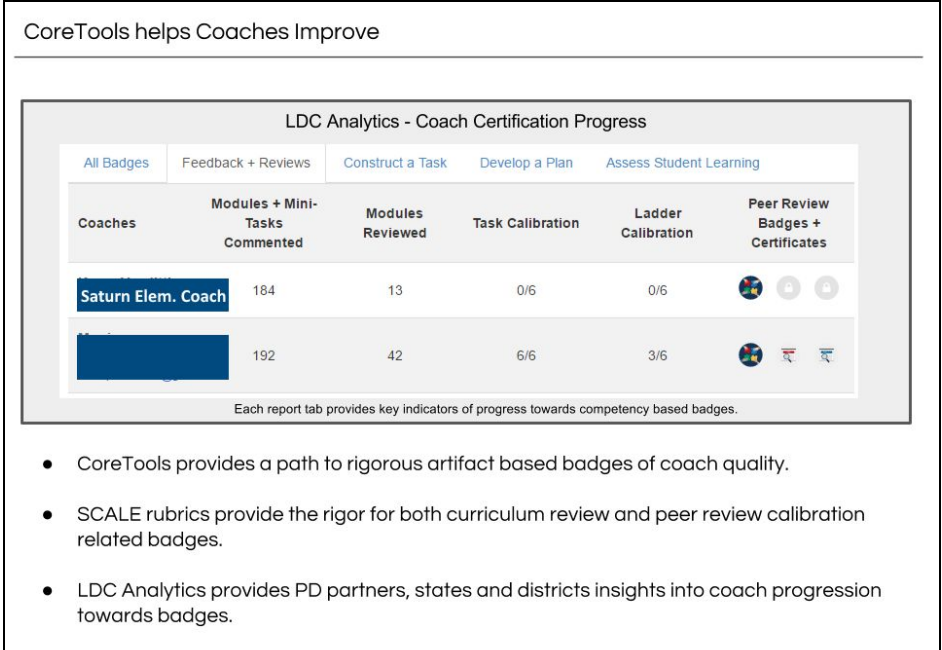
Thus, LDC has implemented a host of data collection mechanisms and processes to measure and progress-monitor teacher and coach skill mastery and implementation success at multiple levels:
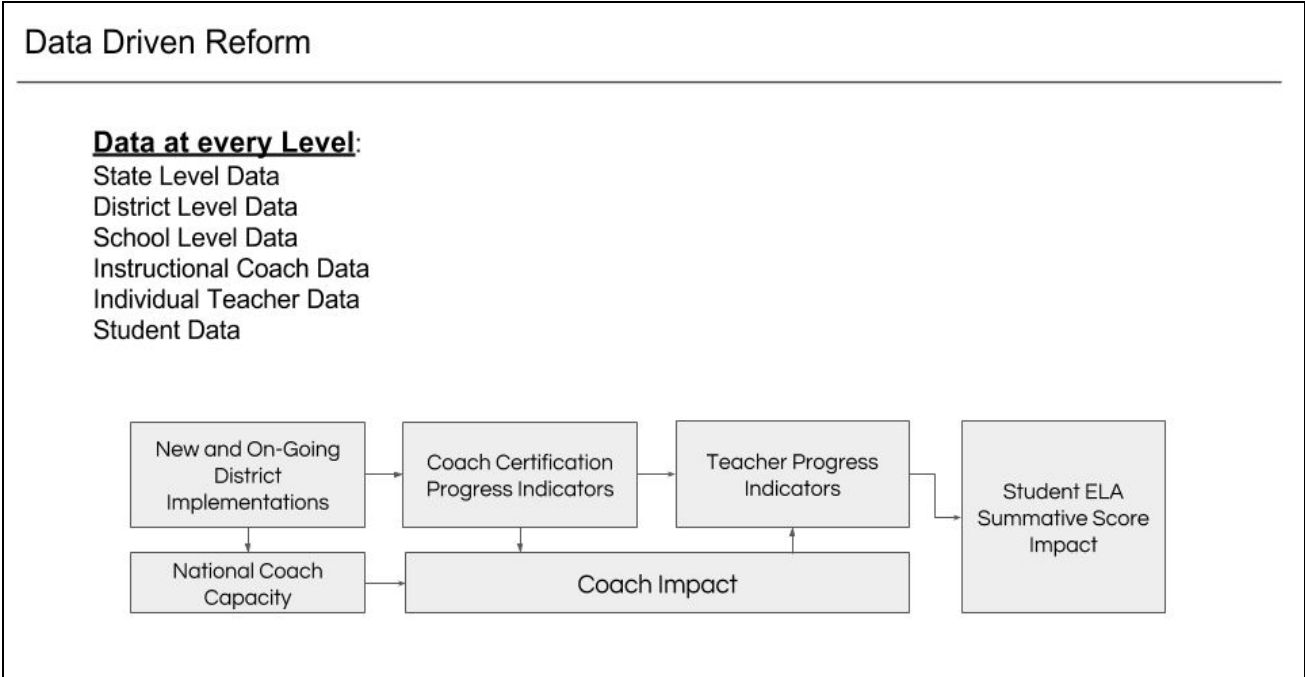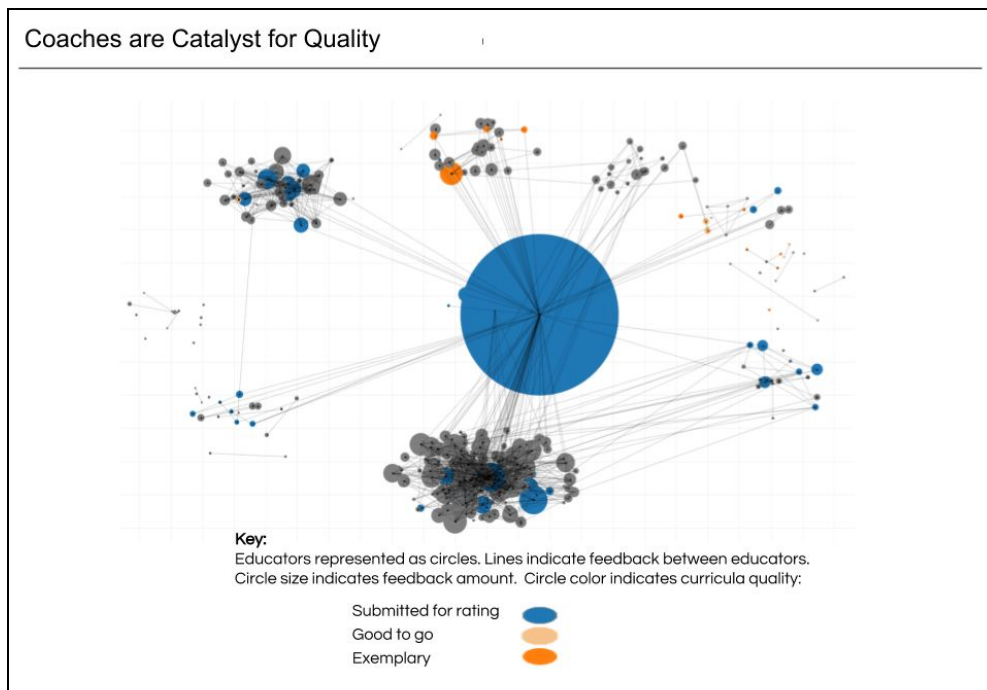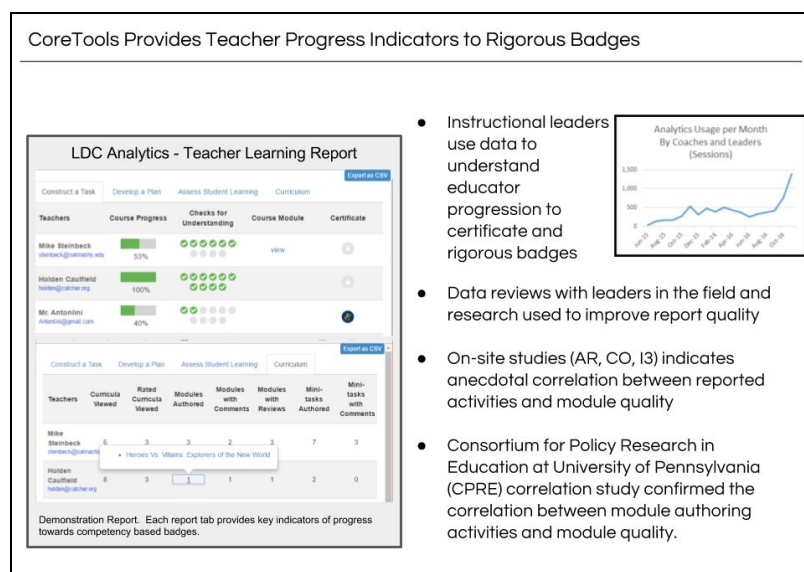
LDC data rolls up and drills down at each level:

System Level insights connect to rigorous teacher data and progress indicators
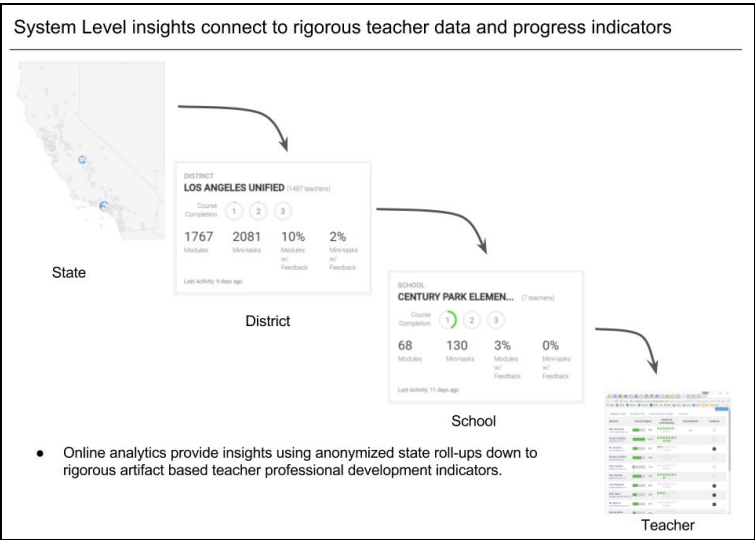
At the instructional coach level, LDC tracks both the coach's individual skill development—through the coach certification process—but also their efficacy in building the skills of the teachers they work with.

CoreTools helps Coaches Improve

- CoreTools provides a path to rigorous artifact based badges of coach quality.
- SCALE rubrics provide the rigor for both curriculum review and peer review calibration related badges.
- LDC Analytics provides PD partners, states and districts insights into coach progression towards badges.

Coach engagement—and efficacy—with teachers can be directly tracked through LDC's backend data collection. For example, we are able to confirm that certain types of coach actions directly lead to evidence of teacher college ready standards skill mastery as evidenced by SCALE-measurable teacher artifacts:

Coaches are Catalyst for Quality

Key:
Educators represented as circles. Lines indicate feedback between educators.
Circle size indicates feedback amount. Circle color indicates curricula quality:

Submitted for rating
Good to go
Exemplary

And finally, LDC data collection cascades down to data reflecting teacher skill progress including both ongoing embedded course teacher assessments and curricular artifacts evidencing mastery of standards instruction:

CoreTools Provides Teacher Progress Indicators to Rigorous Badges

- Instructional leaders use data to understand educator progression to certificate and rigorous badges
- Data reviews with leaders in the field and research used to improve report quality
- On-site studies (AR, CO, I3) indicates anecdotal correlation between reported activities and module quality
- Consortium for Policy Research in Education at University of Pennsylvania (CPRE) correlation study confirmed the correlation between module authoring activities and module quality.

LDC's research continues as we work to collect evidence of student progress at scale (in addition to our three-year CRESST study in i3 (in NYC and LAUSD).

5) Online CoreTools Leading and Lagging Teacher (& Coach) Performance Data

LDC also conducts formative research seeking to identify early stage barometers of teacher (and coach) skill development with the goal of providing actionable leading indicators of quality through LDC

CoreTools analytics. These analytic reports support coach and leader workflow for efficacy and efficiency and have been carefully designed with regular educator feedback (from PD providers, instructional leaders, and coaches) to include key information, including actionable leading indicators of quality to shift classroom behaviors across the community.

To confirm these leading indicators, LDC works with CPRE-trained researchers to look for connections between school tests scores, artifact-based badges, and leading indicators within LDC CoreTools data. LDC's most recent teacher progression report released for the 2016–2017 school year confirmed the correlation between module authoring activities and module quality. Additional analysis indicated that coach feedback leads to greater teacher engagement and deeper learning.
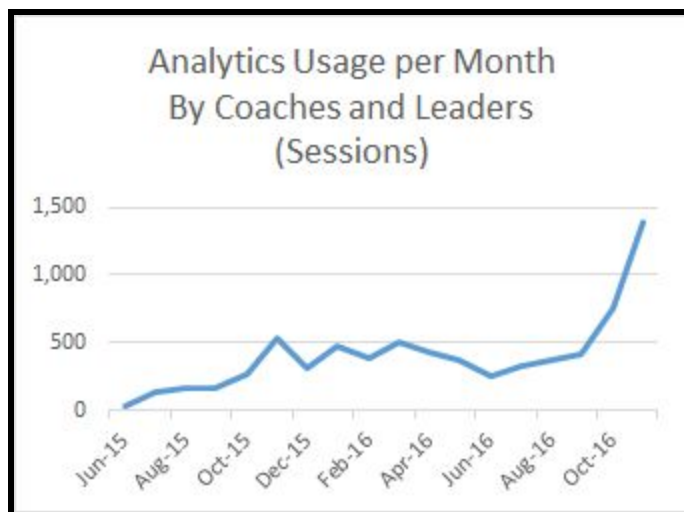
Studies connecting student summative test scores and artifact based badge data to LDC CoreTools data will be used to inform reports released for the 2017–2018 school year. These studies have already begun and are currently underway.