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Effects of Professional Learning Opportunities on Learner Growth

Initial Analysis of the Impact of Personalized Professional Learning on Learner Growth

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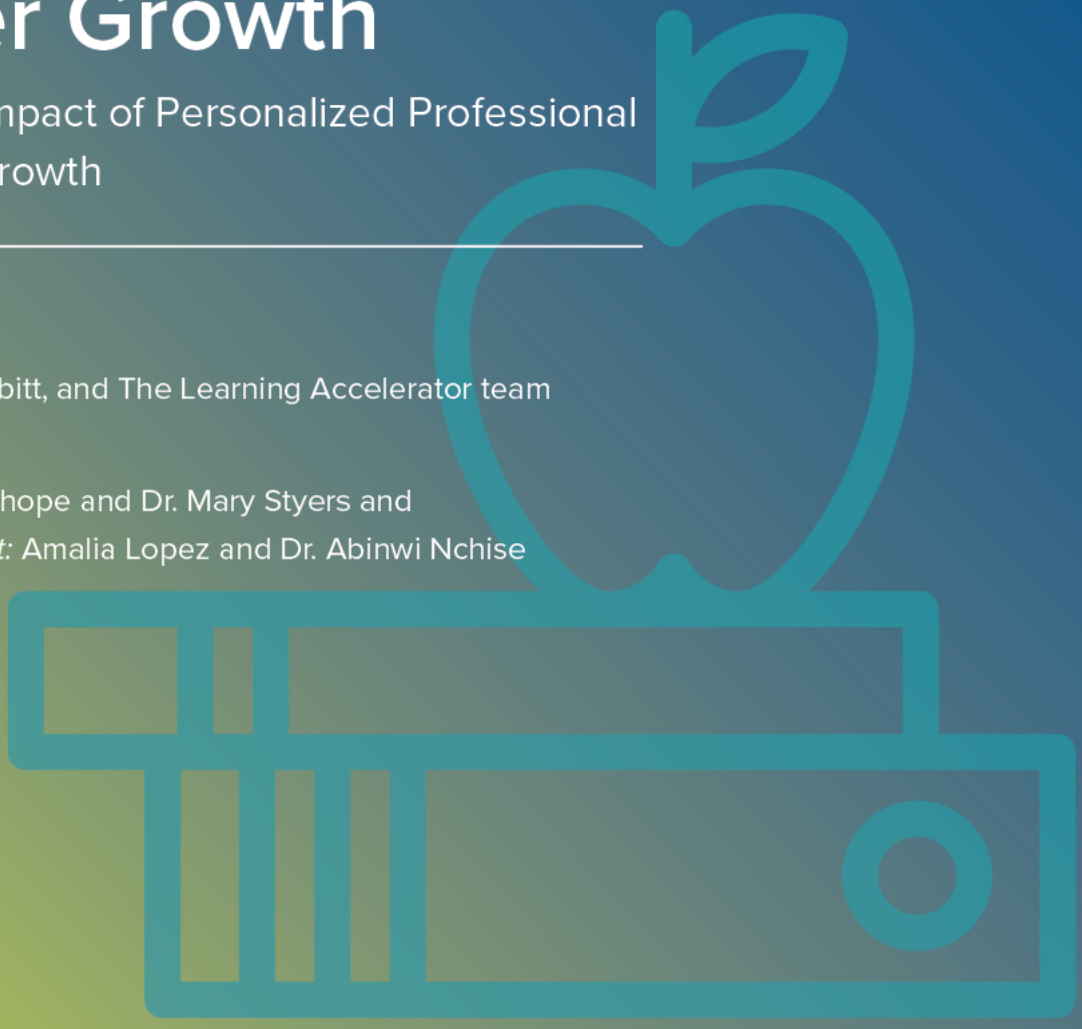

The Learning Accelerator | LINDSAY UNIFIED SCHOOL DISTRICT

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Abstract

Beginning in the 2017-18 School Year, Lindsay Unified School District (LUSD) launched a strategy to provide personalized professional learning opportunities to its learning facilitators (i.e., teachers) to support the development of the district's Adult Learning Curriculum (ALC) as part of a Teacher and School Leader (TSL) grant initiative. To measure the effectiveness of LUSD's professional learning approach on learner (i.e., student) growth, this initial analysis addresses three primary research questions using data from the first two years of the grant: (1) how did engaging in professional learning affect learner achievement? (2) which combinations of professional learning emerged in terms of type and dose? and (3) which combinations had the greatest effect on learner outcomes? The conclusions from this report will inform the direction of subsequent analyses and serve as a first indication of the effectiveness of the professional learning opportunities implemented under the TSL grant initiative.

Executive Summary

Lindsay Unified School District (LUSD) has made a commitment to ensuring that all learners have the very best learning experiences every day. Through its Strategic Design, the district has articulated a clear vision for personalized, performance-based learning for children as well as adults.

We use the following LUSD language throughout this report:

Learner = student
Learning facilitator = teacher
Learning environment = classroom
Learning community = school

Through the institution of a professional learning plan funded by the district's *TSL Empower Lindsay Grant* – a federally funded Teacher and School Leader (TSL) Grant initiative – LUSD is creating high-quality, personalized, performance-based professional learning approaches for learning facilitators and leaders. The Learning Accelerator (TLA) has worked in partnership with the LUSD leadership team to design and implement a comprehensive and ongoing research plan to demonstrate, document, and analyze the effects of personalized professional learning and performance-based compensation on both learner achievement and adult competencies.

Research Questions and Purpose of This Report

At the heart of the work conducted in association with this TSL Grant lies an overarching research question:

"Which professional learning pathways or combinations are most powerful for increasing learner growth?"

In this report, we build on that question with three more specific ones:

1. **How did engaging in different types of professional learning opportunities (i.e., Focus Institute, Learning Academy, Micro Credential, Site-based Learning Academy, Master's Course, or TIE Online Course) affect learner outcomes?** Because different learning facilitators participated in professional learning at different times during the school year, the analysis associated with this question solely examined End-of-Year scores in reading, English Language Arts (ELA), and math.

2. **Which clusters of professional learning opportunities emerged in terms of the combinations of professional learning and in terms of duration (measured in hours)?** Using a statistical modeling strategy called *cluster analysis*, we identified which combinations of professional learning opportunities emerged in Grant Year 1 and Grant Year 2 based on type and participation. Then, we determined combinations based on duration – meaning the number of hours that the learning facilitators engaged in professional learning. Results of these cluster analyses were used to answer the final research question.

3. **Which combinations of professional learning – both in terms of type and duration – had the greatest effect on learner achievement as measured by the various learner assessments, and which combinations had the greatest effect within the English Learner population?** Using the combinations identified by the cluster analyses, we then examined the effects on learner growth.

To answer these questions, and measure that effect of professional learning on learner growth, the analysis relied on a combination of formative and summative assessment scores for reading, ELA, and math by using the following measures:

- **Developmental Reading Assessment (DRA)**[1] **-** a formative measure of reading growth for K-2 learners taken 2-3 times per year.
- **Scholastic Reading Inventory (SRI)**[2] **-** a formative measure of reading for learners in 3-12 that is collected 4 times each year.
- **Smarter Balanced Assessment Consortium (SBAC) -** a state-level, summative measure of math and ELA for all learners in content levels 3-12.
- **English Language Proficiency Assessment for California (ELPAC)**[3] - an indicator of English proficiency for learners in K-12.

[1] Pearson. (2019). *DRA Developmental Reading Assessment, Third Edition [DRA3]*. https://www.pearsonassessments.com/store/usassessments/en/Store/Professional-Assessments/Academic-Learning/Developmental-Reading-Assessment-%7C-Third-Edition/p/100001913.html
[2] Scholastic Inc. (2019). *Scholastic Reading Inventory research summary*. http://teacher.scholastic.com/products/product_info/pdf/SRI_Research%20Summary_Revised.pdf
[3] English Language Proficiency Assessments for California (ELPAC). (2017). *Assessment fact sheet.* https://www.elpac.org/s/pdf/ELPAC_Assessment-fact-sheet-english.pdf

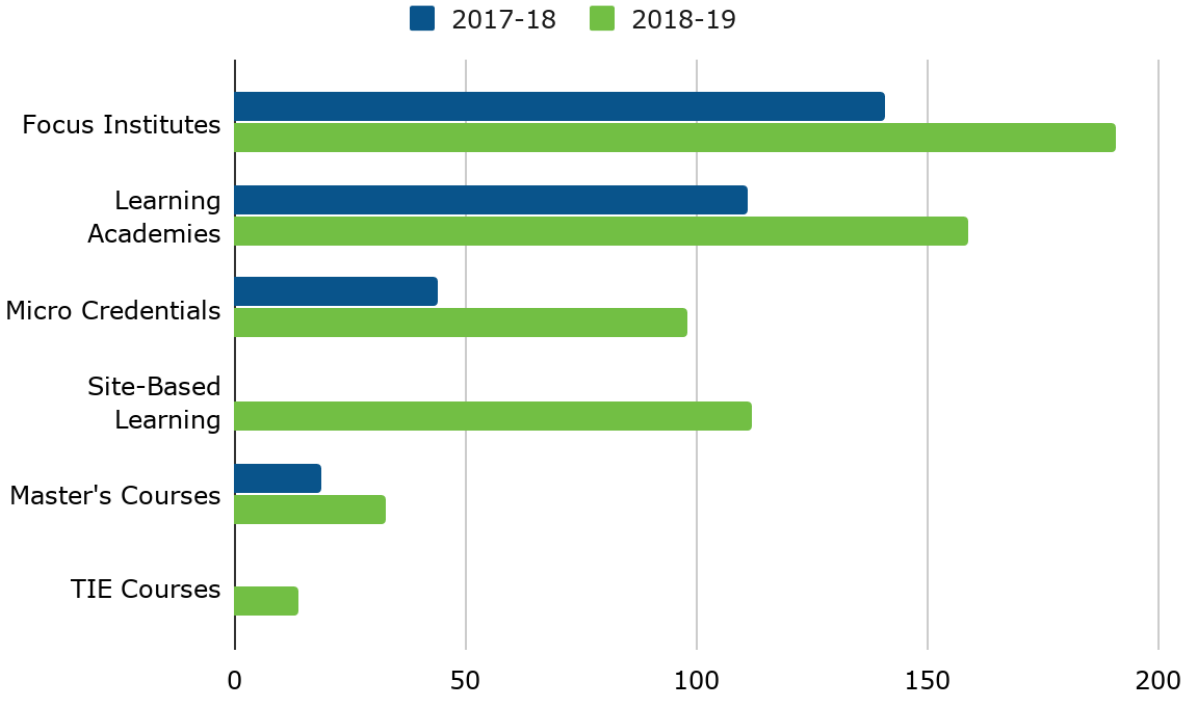
Context: LUSD Professional Learning Overview

For the past three years, every LUSD professional learning opportunity (PLO) has focused on a topic directly related to either LUSD's district academic initiative, Performance Based System, or Adult Learning Curriculum. Constructed and modeled after the LUSD vision of personalization, the variety of professional learning opportunities allowed for learner voice and choice as well as customized skill development.

All TSL professional learning opportunities were completely voluntary, ranged in terms of the level of time commitment, and included a performance- based compensation strategy, such as a financial incentive or increased pay scale credit awarded upon completion or certification. Across all content areas and content levels, 81.7% of the learning facilitators (n=169) participated in professional learning during Grant Year 1, and 93.5% (n=168) participated in Grant Year 2. Figure 1 provides an overview of the total number of professional learning opportunities completed during the first two years of the grant.

LUSD's *Performance Based System* is a comprehensive approach to learning in which the entire educational system is organized around engaging learners in developing 21st century skills while having them work at their performance level and advancing through their learning only when they have demonstrated proficiency of the required knowledge or skills.

Total Count of Learning Facilitator Participation by PLO Type



Professional Learning Opportunities	
Focus Institutes 	One- to three-day events that addressed a specific topic of interest such as content literacy, digital skills, or supporting English Learners.
Learning Academies 	Multiple days of professional learning focused on an instructional topic or pedagogical practice. Learning facilitators could earn certification through learning environment observation and the development of a learning portfolio.
Micro Credential 	Multiple days of professional learning focused on an instructional topic or pedagogical practice. Learning facilitators could earn certification through learning environment observation, virtual coaching, as well as the development of a learning portfolio and other evidence.
Site-based Learning Academies 	Offered beginning in Year Two, these learning-community (i.e., school site) specific events allowed learning facilitators to attend, complete, or certify in a topic. Unlike district-wide Learning Academies, these professional learning opportunities were specific to the learning community and occurred during work days vs. non work days. Learning facilitators could choose to attend or certify.
Technology, Innovation, & Education (TIE) Courses 	Self-paced, asynchronous, online courses that allowed learning facilitators to develop expertise in district-aligned topics such as blended learning, flipped learning, learner engagement, project-based learning, and learner motivation.
Master's Courses 	Through university partners such as Wilson College, the University of Sioux Falls, or Arizona University, Master's Degrees in a number of fields aligned to the district's needs including Mass Customized Learning, Special Education, and Teaching English Learners. In addition, specialized programs were allowed in content areas through individual universities.

Professional Learning Combinations

Since learning facilitators participated in multiple professional learning opportunities during the two grant years, we conducted cluster analyses to classify learning facilitators based on similarities in engagement both in terms of the types of opportunities and the duration of time spent engaged in professional learning. After completing each cluster analysis, we ran a discriminant analysis to determine the quality of the model fit, meaning the statistical likelihood that the analysis adequately placed the learning facilitators into the correct combinations. This discriminant analysis also allowed us to statistically identify the optimum number of clusters for examination per school year.

We analyzed the two grant years separately, resulting in two sets of combinations. In Grant Year 1 (School Year 2017-18), the discriminant analysis determined that the model would best fit using four distinct clusters (k=4). The discriminant analysis identified five distinct clusters (k=5) for Grant Year 2 (School Year 2018-19). The figures below describe the clusters based on type and duration.

Illustration of the Grant Year 1 Clusters by PLO Type

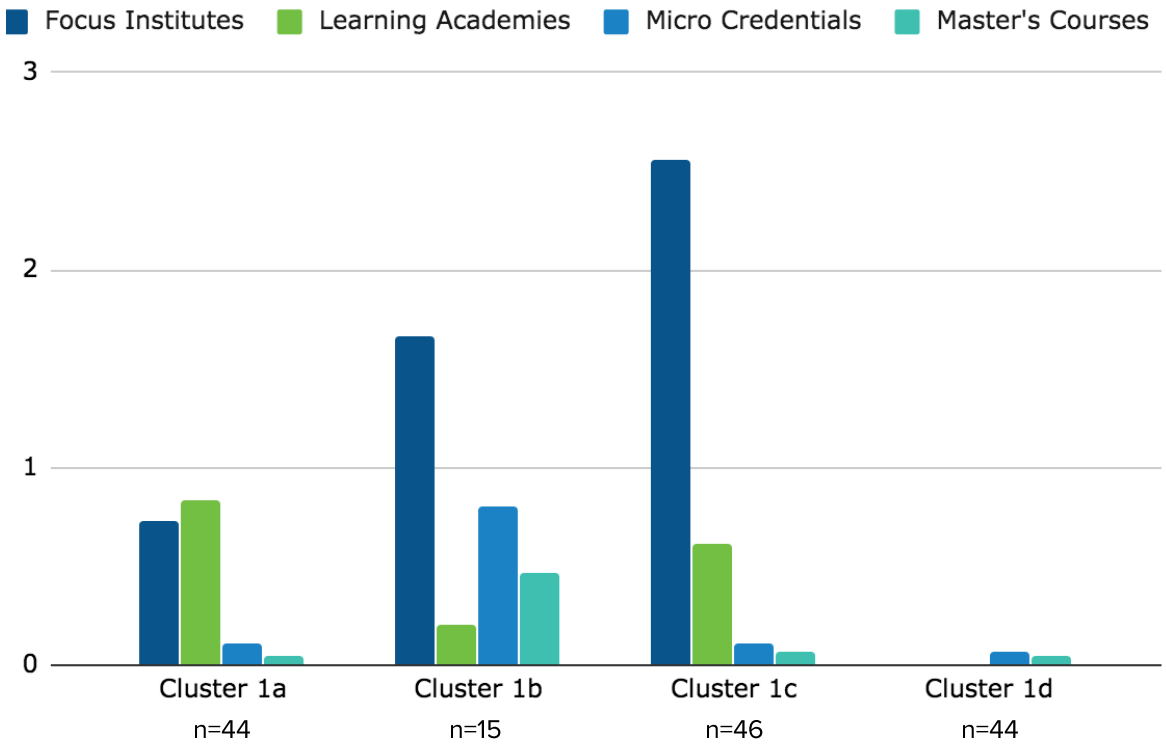
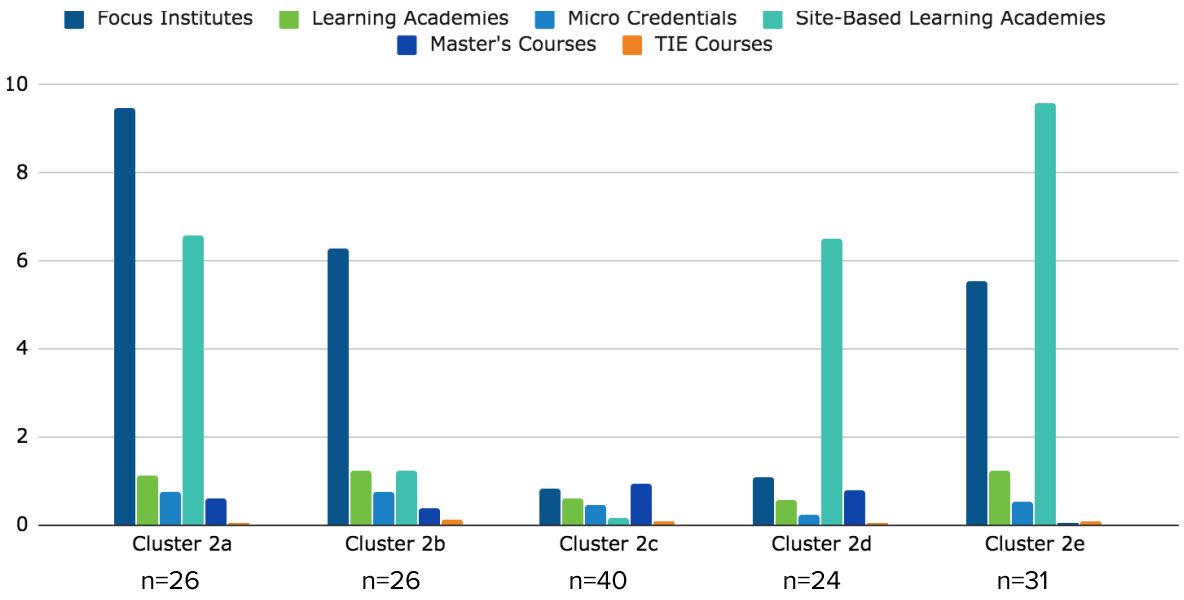


Illustration of the Grant Year 2 Clusters by PLO Type



Cluster Composition by Content Level and Duration for Grant Year 1

	K-2 # (%)	3-5 # (%)	6-8 # (%)	9-12 # (%)	Mean Duration (SD)	Total Hours Completed
High (*n* = 14)	1 (7.1%)	5 (35.7%)	5 (35.7%)	3 (21.4%)	167.6 (21.4)	2,346
Moderately High (*n* = 34)	9 (26.5%)	8 (23.5%)	8 (23.5%)	9 (26.5%)	52.1 (10.2)	1,770
Moderately Low (*n* = 45)	21 (46.7%)	10 (22.2%)	6 (13.3%)	8 (17.8%)	29.3 (5.9)	1,320
Low (*n* =56)	14 (25.0%)	10 (17.9%)	12 (21.4%)	20 (35.7%)	2.9 (4.6)	162

Cluster Composition by Content Level and Dose for Grant Year 2

	K-2 # (%)	3-5 # (%)	6-8 # (%)	9-12 # (%)	Mean Duration (SD)	Total Hours Completed
High (*n* = 18)	1 (5.6%)	6 (33.3%)	5 (27.8%)	6 (33.3%)	757.6 (158.9)	13,673.3
Moderately High (*n* = 14)	2 (14.3%)	5 (35.7%)	3 (21.4%)	4 (28.6%)	267.4 (78.9)	3,743.6
Moderate (n=45)	20 (44.4%)	12 (26.7%)	10 (22.2%	3 (6.7%)	136.8 (24.0)	6,157.9
Moderately Low (*n* = 41)	17 (41.5%)	7 (17.1%)	6 (14.6%)	11 (26.8%)	78.3 (16.4)	3,211.8
Low (*n* =29)	4 (13.8%)	5 (17.2%)	8 (27.6%)	12 (41.4%)	13.4 (14.2)	387.2

To answer the research questions, we first looked at the effects of each type of professional learning opportunity on learners' End-of-Year scores in reading, ELA, and math. Then we built statistical models of growth (i.e., latent growth models) using the DRA and SRI data to test the extent to which the clusters predicted learner growth. Finally, we used predictive models to examine the effects of the different clusters on the summative ELA and math data from the SBAC. Because LUSD also wanted to specifically examine the critical sample of English Learners, we repeated both the growth models and the predictive analysis on the sub-set of learners who had completed the English Language Proficiency Assessments for California (ELPAC). Additionally, we examined the effects of the different clusters on English Learner ELPAC performance. As a result of all of these analyses, three key findings emerged.

Finding #1 - The Need for Multiple Types of High-Quality Professional Learning

Learning facilitators in LUSD could choose from a menu of professional learning opportunities that differed in terms of topic, level of development, time commitment, and performance-based compensation. Therefore, it was critical to understand whether any particular type of professional learning might have a more substantial effect on learner growth.

An analysis of the end-of-year scores on both formative reading assessments as well as summative assessments in ELA and math revealed that no single type of professional learning – examined in isolation – had a considerable impact.

To account for the fact that learning facilitators participated in multiple professional learning opportunities, we conducted cluster analyses to identify groups based on similarities in engagement both in terms of the types of professional learning opportunities and the number of PLOs completed.

Across both grant years, those clusters that included a variety of PLO types – particularly some combination of Focus Institutes, Learning Academies, Site-based Learning Academies, and Micro Credentials – tended to have a greater magnitude of effect on both formative and summative assessments.

Finding #2 - The Need for Breadth and Depth

Given our analysis of existing professional learning literature, we hypothesized that dose, or the duration of participation, would also be important. Multiple studies[4] presented evidence that sustained professional learning – that which occurred over extended periods of time – resulted in greater improvements to student outcomes. Within this LUSD study, depth manifested in two different ways.

By design, some professional learning opportunities provided learning facilitators with greater opportunity for depth. For example, Master's Courses and TIE Courses required significant time investments over extended periods. Similarly, Learning Academies, Site-based Learning Academies, and Micro Credentials all incorporated multiple face-to-face workshops and ongoing coaching.

On the contrary, Focus Institutes followed more of a traditional "one-and-done" workshop model. Learning facilitators could complete a single day and then move on. While the previously mentioned studies found this form of professional learning to be relatively ineffective, our analysis did not result in the same finding. We believe that this is because some learning facilitators completed more than one Focus Institute or combined Focus Institutes with other professional learning opportunities.

For these reasons, we conducted cluster analyses based on dose, calculated as average duration in hours. Although we hypothesized that a positive relationship might exist between duration of professional learning and learner growth, the effects varied, especially by content level. We

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[4] Dede, C., Ketelhut, D., Whitehouse, P., Breit, L., McCloskey, E. (2008). *A Research agenda for online teacher professional development. Journal of Teacher Education, 60*(1), 8 - 19. https://dx.doi.org/10.1177/0022487108327554
Didion, L., Toste, J., Filderman, M. (2019). Teacher professional development and student reading achievement: A meta-analytic review of the effects. *Journal of Research on Educational Effectiveness, 13*(1), 29-66. https://dx.doi.org/10.1080/19345747.2019.1670884
Penuel, W., Fishman, B., Yamaguchi, R., Gallagher, L. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921 - 958. https://dx.doi.org/10.3102/0002831207308221

attribute this finding to a combination of factors. First, fewer learning facilitators could be categorized as *High* or *Moderately High*, so discrepancies existed in terms of sample size. Second, because of the disproportionate amount of time required to complete Master's Courses, the High category largely consisted of just those few learning facilitators. Finally, especially by Grant Year 2, the majority of learning facilitators had received far more than the minimum amount of time suggested by the literature as being required to see improvement. As such, we concluded that the duration in hours may not serve, in and of itself within the LUSD context, as a distinguishing factor.

On the contrary, clusters that contained both a variety of different PLO types and a higher average completion rate had a greater likelihood to predict a positive magnitude of effect. For example, during Grant Year 1, Cluster 1c – which averaged 2.56 Focus Institutes in addition to Learning Academies and Micro Credentials – had the greatest effect on DRA scores for K-2 learners. Assignment to Cluster 1b, which had slightly fewer Focus Institutes but more Micro Credentials, predicted positive gains in ELA and math on the SBAC for learners in content levels K-8. Similarly, in Grant Year 2, assignment to Cluster 2b had a positive effect on learners' SRI scores. Learning facilitators in that cluster participated in numerous Focus Institutes, Learning Academies, and Site-based Learning Academies. **Given that all of these clusters not only included multiple types of PLOs but also multiple opportunities, we conclude that both breadth and depth likely led to improved learner growth.**

Finding #3 - No Single Pathway for All Learners

At the heart of personalized learning lies the assumption that individual learners require different pathways and supports. LUSD has extended this belief to its learning facilitators and designed a professional learning program that allows for choice, different levels of need or expertise, and personal agency. While the analyses in this report attempted to ascertain which combinations of professional learning opportunities would lead to the greatest student growth, **one clear finding emerged: no singular pathway existed for all learners.**

Whether examining the effects of professional learning on formative reading data or summative SBAC scores, variation existed across content levels. For example, in Grant Year 1, assignment to Clusters 1a and 1d had a positive magnitude of effect on reading growth for K-8 learning facilitators, but not 9-12. Meanwhile, in Grant Year 2, membership in Cluster 2b positively affected all content levels' reading growth, but did not predict growth in ELA or math for content levels 6-8 or 9-12.

When focusing specifically on English Learners, not only did variation exist across content levels but also when considering reclassification. Even though cluster assignment might positively predict ELPAC performance, it did not necessarily correlate with the percentage of students who could be reclassified as English proficient.

Implications for Future Practice

As a result of these various analyses, we can make three suggestions to LUSD:

1. **LUSD should continue to offer multiple types of high-quality professional learning opportunities.** Since the findings do not strongly suggest that some types of opportunities may be more effective than others, the district should continue to offer personalized pathways to professional learning that allow for a variety of formats, durations, and certifications.

2. After examining the types of professional learning opportunities offered to learning facilitators and the amount of time that they spent engaged in professional learning, we believe that **both breadth and depth matter.** LUSD should continue to encourage learning faciltiators to engage in multiple types of professional learning over a sustained duration of time.

3. While the analyses in this report attempted to ascertain which combinations of professional learning opportunities would lead to the greatest student growth, **one clear finding emerged: no singular pathway exists for all learners.** We believe that this data validates the district's current approach to professional learning and that LUSD should continue to approach the development of its learning facilitators in much the same way as its students: with an eye to personalization.

Final Take-Aways

Since this report exists as just the initial analysis, future reports will need to examine these trends in more detail and also should address the following:

- **How the content or topic of the professional learning affected learner growth**. Expanding on the findings from the Guided Reading research, examine whether learning facilitators who participated in content-specific PLOs saw greater growth in those particular content areas.

- Rather than just look at the effects of professional learning at the content level, **ascertain the impact within individual learning communities**. This is particularly salient given the prevalence of Site-based Learning Academies in Grant Year 2, varying participation rates across learning communities, and different learning facilitator as well as learner attributes.

- This initial report only used formative reading data and summative performance data in ELA and math as learner measures. **Additional learner information may provide a more thorough understanding of which combinations of professional learning most benefited which learners across all content levels** and should be incorporated into future analyses.

Introduction and Background

Lindsay Unified School District (LUSD) has made a commitment to ensuring that all learners have the very best learning experiences every day. Through its Strategic Design, the district has not only articulated a clear vision for personalized, performance-based learning for children but also for adults. Through the institution of a professional learning plan funded by the district's *TSL Empower Lindsay Grant* - a federally funded Teacher and School Leader (TSL) grant initiative - LUSD began a personalized professional learning program for its learning facilitators and leaders. Over the course of three academic years (2017-2020), learning facilitators and leaders in LUSD have had the option to participate in a range of professional learning opportunities designed to develop their capacity to implement the district's vision of the Ideal Learning Experience. Ranging from multi-year master's degree programs to daylong Focus Institutes on specific instructional or leadership topics, LUSD offered a variety of scaled supports to address the various levels of development and personalized paths for professional growth.

We use the following LUSD language throughout this report:

Learner = student
Learning facilitator = teacher
Learning environment = classroom
Learning community = school

To demonstrate and document how school systems can create high-quality, personalized, Performance-based professional learning approaches for learning facilitators and leaders, The Learning Accelerator (TLA) has worked in partnership with the LUSD leadership team. As a result of this collaboration, TLA has designed and implemented a comprehensive and ongoing research plan to analyze the effects of personalized professional learning and performance-based compensation on both learner achievement and adult competencies.

The Overarching Research Question

All of the research and design work conducted in association with this TSL grant has been in service of an overarching research question:

"Which professional learning pathways or combinations are most powerful for increasing learner growth?"

To help answer this question, TLA and LUSD first examined the effects of Guided Reading professional learning on instructional behaviors and learner achievement. That initial report

served as a means to understand patterns of engagement and impact of one specific professional learning opportunity focused on the implementation of a specific instructional strategy. Next, we explored the effects of two general, content-area neutral programs - BetterLesson and PBLWorks - on learner growth across four core content areas: ELA, math, science, and social studies. With both of those initial studies, we also examined the presence of Instructional Look Fors - specific educator actions intended to foster personalized learning. Therefore, the third research study validated the Look Fors as a measurable, reliable, and valid way to understand the relationships between professional learning, observable behaviors within the learning environment, and learner outcomes. The purpose of this latest report is to conduct an initial, holistic analysis of all professional learning that occurred in association with the TSL grant to begin to understand which combinations of activities had the greatest impact on learner achievement.

Professional Learning Opportunities in LUSD

Although learning facilitators in LUSD have engaged in a variety of professional learning opportunities over the past three years, this report presents an initial analysis using available data from Grant Year 1 (2017-18 School Year) and Grant Year 2 (2018-19 School Year). Future reports will incorporate data from Year 3 (2019-2020 School Year).

As all professional learning was voluntary, and since learning facilitators could participate in as many opportunities as they desired, the initial analysis examines Grant Year 1 and Grant Year 2 separately but under two assumptions:

- The effects of professional learning might carry over from year to year. For example, learners whose learning facilitator participated in Guided Reading during the first year of the grant, but not the second, would still benefit from its effects. As such, calculations for Grant Year 2 accounts for participation from Grant Year 1.
- Additional site-based conditions, learning facilitator attributes, and learner characteristics do have an effect. Future analyses will expand on this report and take those factors into account.

Quality and Composition of the Professional Learning Opportunities (PLOs)

Over the past three years, every professional learning opportunity has focused on a topic directly related to either LUSD's district academic initiative, Performance Based System, or Adult Learning Curriculum. Many were constructed and modeled after the LUSD vision of personalization. For example, by offering a variety of professional learning opportunities, LUSD allowed for learner voice and choice as well as customized skill development. Designed to develop learning facilitator and leadership capacity to implement the district's strategic vision for learning, each

professional learning opportunity highlighted specific strategies or content areas in addition to offering various levels of development and personalized paths for professional growth. Further, all TSL professional learning opportunities included a performance-based compensation strategy, such as a financial incentive or increased pay scale credit awarded upon completion or certification.

LUSD's *Performance Based System* is a comprehensive approach to learning in which the entire educational system is organized around engaging learners in developing 21st century skills while having them work at their performance level and advancing through their learning only when they have demonstrated proficiency of the required knowledge or skills.

Table 1: Types of Professional Learning Opportunities

Professional Learning Opportunities	
Focus Institutes 	One- to three-day events that addressed a specific topic of interest such as content literacy, digital skills, or supporting English Learners.
Learning Academies 	Multiple days of professional learning focused on an instructional topic or pedagogical practice. Learning facilitators could earn certification through learning environment observation and the development of a learning portfolio.
Micro Credential 	Multiple days of professional learning focused on an instructional topic or pedagogical practice. Learning facilitators could earn certification through learning environment observation, virtual coaching, as well as the development of a learning portfolio and other evidence.
Site-based Learning Academies 	Offered beginning in Year Two, these learning-community (i.e., school site) specific events allowed learning facilitators to attend, complete, or certify in a topic. Unlike district-wide Learning Academies, these professional learning opportunities were specific to the learning community and occurred during work days vs. non work days. Learning facilitators could choose to attend or certify.
Technology, Innovation, & Education (TIE) Courses 	Self-paced, asynchronous, online courses that allowed learning facilitators to develop expertise in district-aligned topics Such as blended learning, flipped learning, learner engagement, project-based learning, and learner motivation.
Master's Courses 	Through university partners such as Wilson College, the University of Sioux Falls, or Arizona University, Master's Degrees in a number of fields aligned to the district's needs including Mass Customized Learning, Special Education, and Teaching English Learners. In addition, specialized programs were allowed in content areas through individual universities.

Each professional learning opportunity provided by LUSD adhered to at least one of the principles of quality professional development as defined by a seminal study from the American Institutes for Research and the U.S. Department of Education[5]. Between 1996-1997, researchers conducted a large-scale, longitudinal evaluation of professional development funded under the Eisenhower Professional Development Program. After examining both structural and content components of available professional development offerings, the researchers published a set of core tenets that they associated with improved classroom practice[6]:

- **Time:** the researchers linked longer durations over extended periods of time with teacher improvement
- **Focus:** professional development that focused on specific content areas or skills had a greater likelihood of translating into practice
- **Active Learning:** teachers needed opportunities to engage in hands-on learning such as lesson planning and direct observation
- **Relevance:** professional learning that directly related to daily practice also resulted in improved classroom performance

Later studies[7] reference this framework when identifying tenets of quality professional learning. For example, a 2007 review of evidence on the effectiveness of professional learning[8] found that quality professional development programs had a greater effect on student learning. Of particular note, with regards to duration, the researchers observed that programs with at least 14 hours of duration had a positive effect on student achievement, and those that averaged at least 49 hours resulted in substantial improvements in student outcomes.

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[5] Garet, M., Birman, B., Porter, A., Desimone, L., Herman, R. (1999). *Designing effective professional development: lessons from the Eisenhower Program [and] technical appendices*. http://files.eric.ed.gov/fulltext/ED442634.pdf

[6] Garet, M., Porter, A., Desimone, L., Birman, B., Yoon, K. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915 - 945. https://dx.doi.org/10.3102/00028312038004915

[7] Dede, C., Ketelhut, D., Whitehouse, P., Breit, L., McCloskey, E. (2008). *A Research agenda for online teacher professional development. Journal of Teacher Education, 60*(1), 8 - 19. https://dx.doi.org/10.1177/0022487108327554

Didion, L., Toste, J., Filderman, M. (2019). Teacher professional development and student reading achievement: A meta-analytic review of the effects. *Journal of Research on Educational Effectiveness, 13*(1), 29-66. https://dx.doi.org/10.1080/19345747.2019.1670884

Penuel, W., Fishman, B., Yamaguchi, R., Gallagher, L. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921 - 958. https://dx.doi.org/10.3102/0002831207308221

[8] Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. L. (2007). Reviewing the Evidence on How Teacher Professional Development Affects Student Achievement. Issues & Answers. REL 2007-No. 033. *Regional Educational Laboratory Southwest (NJ1)*. https://files.eric.ed.gov/fulltext/ED498548.pdf

In alignment with its vision for personalization, which in part emphasizes learner choice, LUSD presented learning facilitators and leaders with a variety of professional learning opportunities. Not only did these options vary in terms of content area and level of commitment, but they also differed in how they scaled to accommodate levels of knowledge, skill, and expertise. All learning facilitators voluntarily participated in the different professional learning opportunities and could choose from a number of different types of experiences

As mentioned, each available professional learning opportunity offered by LUSD adhered to at least one measure of quality. However, from multi-year Master's Degree programs to day-long Focus Institutes on a specific instructional or leadership topic, the various offerings differed in scope, dose, and structure. In addition, beyond choosing the type of professional learning opportunity and the content, learning facilitators could self-select a level of commitment: *Attended*, *Completed*, *Certified*, or *Earned Degree*. These different levels of commitment then resulted in different levels of performance-based compensation.

Table 2: Comparison of Professional Learning Opportunities

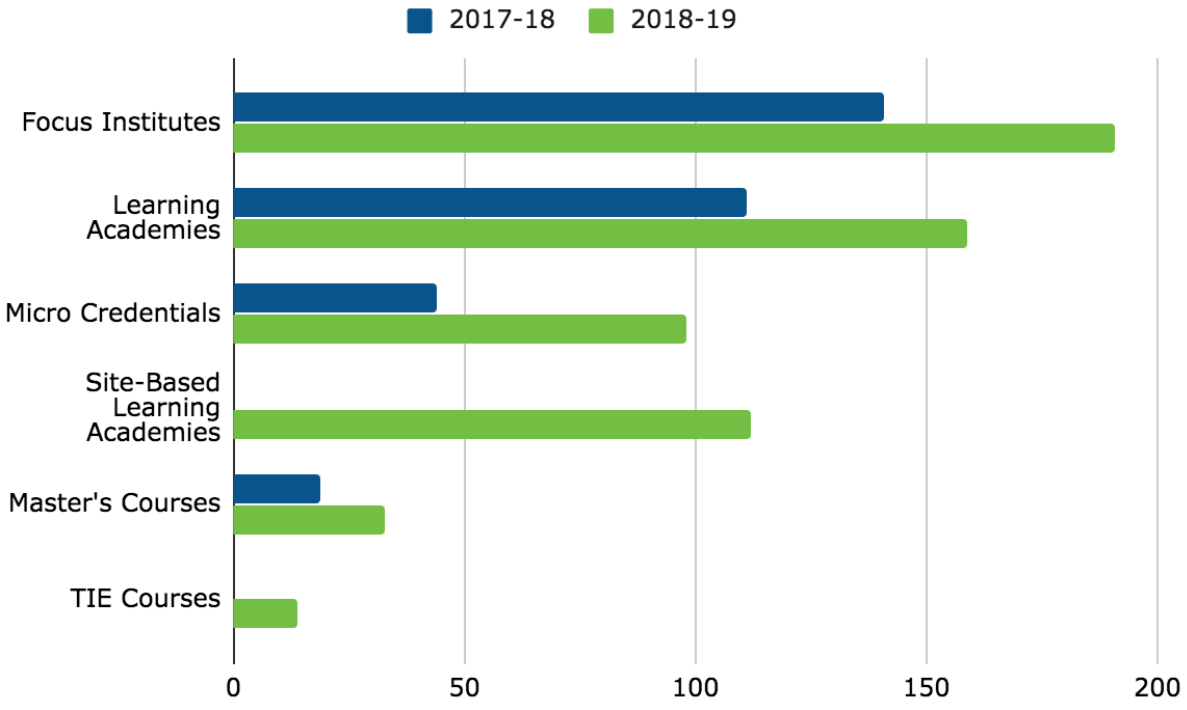
Professional Learning Opportunity	Average Duration (in hours)	Possible Level of Commitment	Key Tenets of Quality	Compensation
Focus Institute	3-24	Attended	Focus, Relevance	$500 per day stipend
Learning Academy	24-30	Attended, Completed, Certified	Time, Focus, Relevance, Active Learning	$500 per day stipend $1,000 upon certification
Micro Credential	12-30	Attended, Completed, Certified	Time, Focus, Relevance, Active Learning	$500 per day stipend $2,000 upon certification
Site-based Learning Academy	24-65	Attended, Completed, Certified	Focus, Relevance, Active Learning	$500 per day stipend or appropriate pro-rate $1,000 upon certification
Master's Course	40+	Degree Earned	Time, Focus, Relevance	Certificated salary step schedule units Upon completion, annual district master's stipend of $2,193
Technology, Innovation, & Education (TIE) Courses	20	Completed	Time, Focus, Relevance	Certificated salary step schedule unit

LUSD set performance-based compensation based upon analysis of existing, average hourly rates paid to learning facilitators. Because many Site-based Learning Academies occurred during the afternoon on work days and not as full-day experiences, learning facilitators received a prorated stipend based on the rate of $500 per day. With Master's Courses and the TIE online courses, learning facilitators earned graduate units which increased their salary schedule upon completion. Those who earned a Master's degree received an additional annual district stipend of $2,193.

Grant Year 1 & Grant Year 2 Professional Learning Participation

During the first year of the TSL grant, LUSD offered nine Focus Institutes, seven Learning Academies, and four Micro Credentials - the latter two offered optional certification. The district expanded the opportunities in the second year to include 26 different Focus Institutes, four Learning Academies, four Micro Credentials, as well as the addition of Site-based Learning Academies, and Technology, Innovation, & Education (TIE) online courses (see Appendix A for titles and descriptions of the various professional learning opportunities). Additionally, 38 learning facilitators began Master's degree programs in 2018 with expected completion dates between fall 2019 and summer 2021. Figure 1 illustrates the total number of different professional learning opportunities completed per year of the grant.

Figure 1: Total Count of Learning Facilitator Participation by PLO Type



As mentioned earlier in this report, evidence from the literature indicates professional learning programs with a sustained duration are more likely to lead to improved student outcomes[9]. Therefore, we examined the amount of time - or dose - that learning facilitators and leaders spent engaging in professional learning during each year of the grant.

Table 3: Duration of Professional Learning Opportunities (in hours)

Grant Year	Range	Mean (Standard Deviation)
2017-18 (n=173)	6-201	50.86 (45.67)
2018-19 (n=220)	6-1080.33	173.19 (221.78)

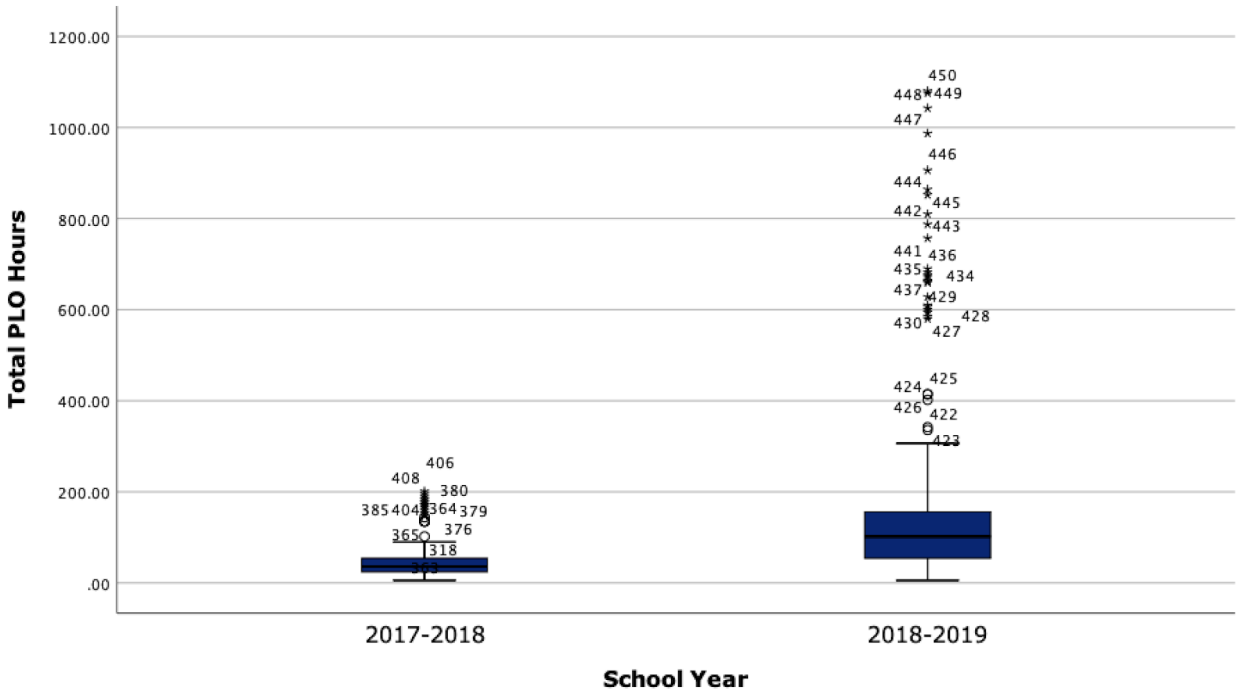
**n = the total number of participants including both learning facilitators and leaders*

Upon further examination, it became apparent that the wide variation in dose can be attributed to the various combinations of professional learning completed by the learning facilitators as well as the extended duration of the Master's degree courses as illustrated by Figure 3. Although the majority of individuals completed fewer than 200 hours, the Masters' Courses required substantially more time.

[9]Garet, M., Porter, A., Desimone, L., Birman, B., Yoon, K. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915 - 945. https://dx.doi.org/10.3102/00028312038004915

Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. L. (2007). Reviewing the Evidence on How Teacher Professional Development Affects Student Achievement. Issues & Answers. REL 2007-No. 033. *Regional Educational Laboratory Southwest (NJ1)*. https://files.eric.ed.gov/fulltext/ED498548.pdf

Figure 2: Variation in Dose during Grant Years 1 & 2



It is also important to note that dosage for Grant Year 2 is considered cumulative, meaning that if a learning facilitator completed 135 Master's hours during Grant Year 1 and then another 135 hours in Grant Year 2, then the total dose for Grant Year 2 would be 270 hours. This is because of the assumption that the effects of professional learning would extend from year to year.

Table 4 presents a comparison of dose for each type of professional learning opportunity. The ranges in time represent several different factors. First, because many learning facilitators completed more than one professional learning opportunity, the dose could represent multiple different opportunities. For example, a learning facilitator who completed two, 6-hour Focus Institutes would have 12 hours of dose; and yet another learning facilitator might have completed one, 12-hour Focus Institute that spanned two days. Second, both the Learning Academies and Micro Credentials were designed to span multiple days. Therefore, they provided increased dose versus the Focus Institutes. Finally, as mentioned, the Master's Courses required the most investment in time; each course averaged over 40 hours of commitment.

Table 4: Duration of Professional Learning Opportunities (in hours) by Type

PLO	2017-18			2018-19		
	n	Range	Mean (SD)	n	Range	Mean (SD)
Focus Institutes	141	6-36	14 (7.20)	185	4-118	37.38 (23.51)
Learning Academies	111	24-84	27.30 (8.74)	159	24-108	35.55 (16.67)
Micro Credentials	44	24-54	26.86 (6.0)	98	18-90	32.03 (14.49)
Site-based Learning Academies	NA	NA	NA	112	4.5-64.47	34.30 (15.52)
Master's Courses	19	135-135	135 (0)	33	135-945	552.27 (232.27)
TIE Courses	NA	NA	NA	14	15-75	23.57 (17.37)

It is important to remember that learning facilitators, leaders, and staff volunteered to participate in the professional learning opportunities.

- Across ALL content areas and content levels, 81.7% of the learning facilitators (n=169) participated in professional learning during Grant Year 1 and 93.5% (n=168) participated in Grant Year 2.
- Given reliance on standardized student achievement data, this report only examines K-8 learning facilitators and core content area learning facilitators in the high school (e.g., ELA, Math, Science, and Social Studies).
- Within the sample used in the report, 73.8% of the learning facilitators (n=149) participated in at least one professional learning opportunity during Grant Year 1 and 90.5% (n=147) participated in at least one during Grant Year 2.

Learner Assessment Measures

To measure the impact of professional learning on learner growth, the analysis in this report utilizes a combination of formative and summative assessment scores for reading, English Language Arts (ELA) and math. As such the report relies on the following measures:

- Developmental Reading Assessment (DRA)[10] serves as a formative measure of reading growth for K-2 learners;
- Scholastic Reading Inventory (SRI)[11] measures reading for learners in 3-12; and,
- Smarter Balanced Assessment Consortium (SBAC), a state-level measure of both math and ELA, then provides summative data for all learners in content levels 3-12.

This report also includes a specific assessment of a critical subgroup within the LUSD learner population: English Learners. For this reason, the English Language Proficiency Assessment for California (ELPAC) serves as an additional summative indicator of English proficiency for learners in K-12. Subsequent reports will look more broadly at learner growth data.

The following sections explain the purpose and scoring of each assessment used in the analysis for this report. They also present an overview of scores in LUSD beginning with the 2016-17 School Year - the last year before the start of the TSL grant professional learning opportunities - to provide an overview of learner achievement across the district. These scores illustrate the performance of learners over three school years to present an overview before taking the effects of professional learning into consideration.

Developmental Reading Assessment (DRA)

The DRA measures reading ability in five key areas: phonemic awareness, phonics, vocabulary development, reading fluency, and reading comprehension. It is administered multiple times each year for learners in content levels K-2 to measure growth over time and also presents an End of Year (EOY) score. As illustrated by the table below, learners in kindergarten do not take an assessment in August; therefore, their scores only include the March and June data points. A scaled assessment, the range in DRA scores increases with each content level: approximately 0-24 in kindergarten, 0-40 in content level 1, and 0-70 in content level 2 by the end of the year.

[10] Pearson. (2019). *DRA Developmental Reading Assessment, Third Edition [DRA3]*. https://www.pearsonassessments.com/store/usassessments/en/Store/Professional-Assessments/Academic-Learning/Developmental-Reading-Assessment-%7C-Third-Edition/p/100001913.html
[11] Scholastic Inc. (2019). *Scholastic Reading Inventory research summary*. http://teacher.scholastic.com/products/product_info/pdf/SRI_Research%20Summary_Revised.pdf

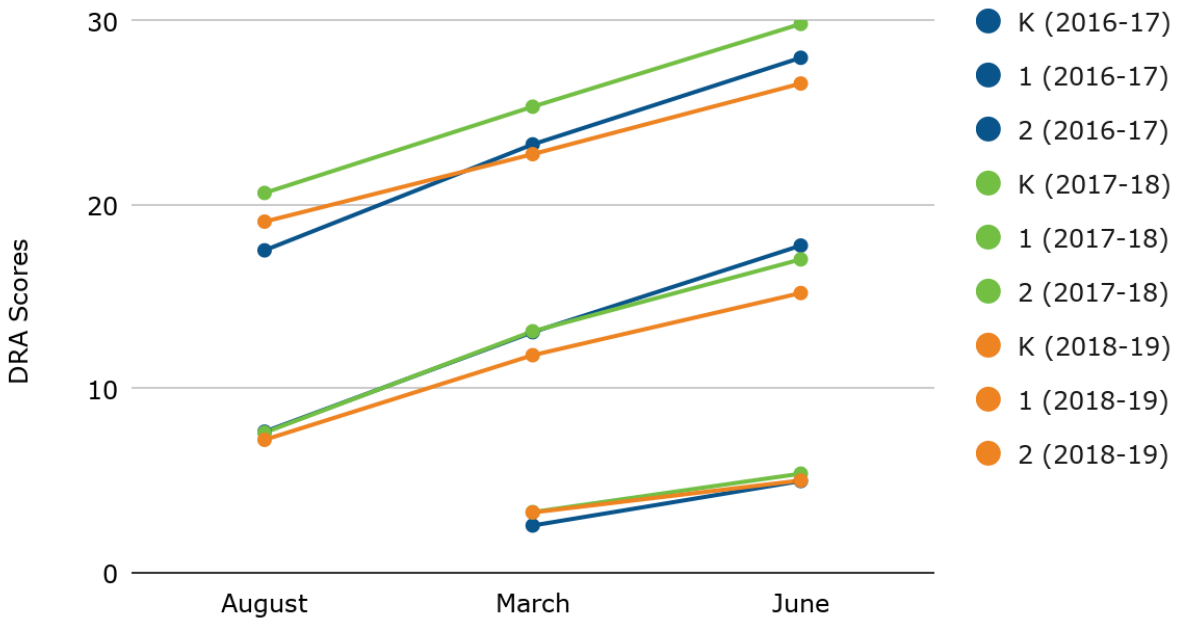
Data from the 2016-17 School Year serves as a baseline for all of the analyses in this report as it represents the last year of data prior to the implementation of the TSL grant professional learning opportunities. Without taking any professional learning into account, the table and figure below illustrate the change in learners' scores on the DRA for each content level through the end of Grant Year 2. Later analyses will use these scores to examine the effects of the professional learning on learner growth.

Table 5: Descriptive Statistics of DRA Scores

Content Level	2016-17			Grant Year 1 (2017-18)			Grant Year 2 (2018-19)		
	August	March	June	August	March	June	August	March	June
K	NA	2.57 (2.79) n=274	4.99 (4.13) n=275	NA	3.30 (2.50) n=299	5.39 (3.70) n=296	NA	3.28 (2.52) n=327	5.02 (3.46) n=323
1	7.67 (5.36) n=335	13.08 (6.22) n=333	17.79 (7.02) n=334	7.62 (5.13) n=276	13.13 (6.96) n=275	17.04 (7.57) n=275	7.23 (5.39) n=309	11.83 (6.75) n=321	15.21 (7.99) n=320
2	17.53 (7.78) n=288	23.29 (8.29) n=285	28.00 (8.25) n=287	20.65 (8.19) n=317	25.34 (9.95) n=319	29.84 (10.01) n=324	19.09 (8.90) n-271	22.76 (9.80) n=279	26.60 (11.01) n=268

** All scores presented as the mean and standard deviation - M(SD) - and then sample size (n)*

Figure 3: Reading Growth based on DRA Scores



Scholastic Reading Inventory (SRI)

The SRI provides data on learners' reading growth and comprehension over time. Much like the DRA, it is a scaled score that increases as learners progress through content levels. A criterion-referenced test, the SRI measures reading using the LEXILE Framework® for Reading[12]. Because expected annual growth in SRI reading scores is higher in elementary than middle or upper content levels[13], the learners were grouped into three levels: elementary (content levels 3-5), middle (content levels 6-8), and secondary (content levels 9-12).

Learners in LUSD take SRI assessments four times each year. The analyses in this report use the first three reported SRI scores as well as the End of Year (EOY) score. To account for some students who do not have fourth window testing scores, the EOY score is the highest Lexile level that a learner attained during the year. Over 90% of the time, the fourth SRI window represented the highest reading score. Thus, the EOY score provides a more accurate picture of learner achievement.

Again, the 2016-17 School Year served as a baseline for the analyses since none of the learning facilitators had yet engaged in any of the professional learning associated with the TSL grant. Particularly in the middle and elementary content levels, the learners generally showed improvements in their reading performance over the three school years. The table and figure below illustrate learner growth from baseline to the end of Grant Year 2. Later analyses will examine the effects of professional learning on this growth.

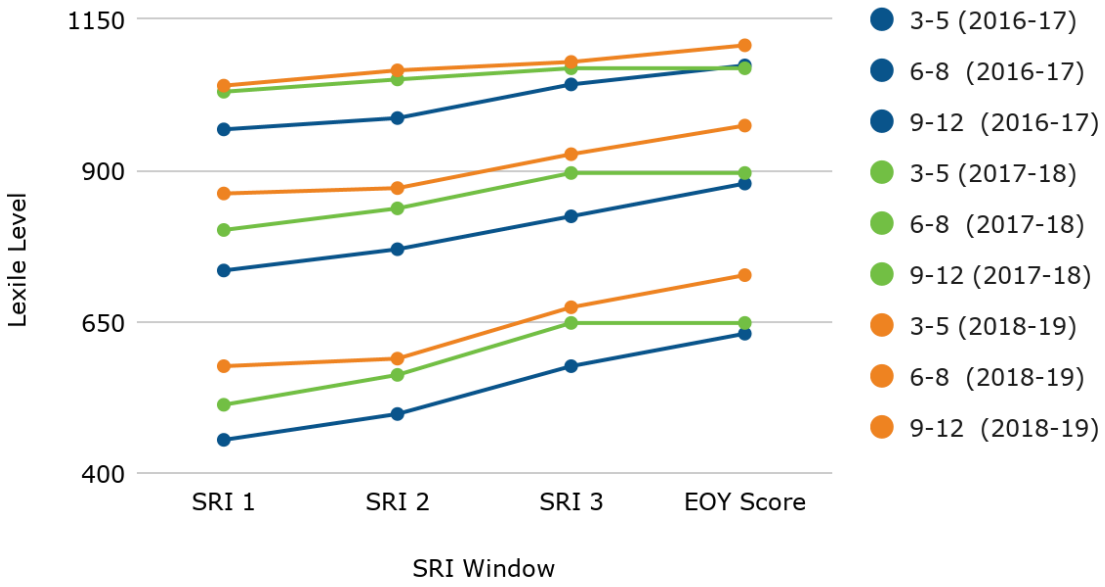
Table 6: Descriptive Statistics of SRI Scores

Content Level	2016-17				Grant Year 1 (2017-18)				Grant Year 2 (2018-19)			
	SRI1	SRI2	SRI3	EOY	SRI1	SRI2	SRI3	EOY	SRI1	SRI2	SRI3	EOY
3-5	454.74z (276.17) n=966	497.5 (266.77) n=965	576.56 (254.20) n=961	630.27 (244.16) n=966	512.74 (273.55) n=942	562.15 (253.71) n=949	648.02 (241.13) n=935	714.00 (230.41) n=918	576.55 (256.21) n=811	589.03 (253.01) n=684	673.88 (241.31) n=823	727.0 (240.72) n=845
6-8	734.70 (301.54) n=956	769.87 (290.94) n=956	824.28 (283.30) n=950	878.43 (275.29) n=956	801.67 (268.74) n=938	837.40 (252.49) n=941	895.87 (236.41) n=928	952.19 (230.72) n=916	862.01 (247.76) n=933	870.91 (246.36) n=714	926.95 (245.43) n=947	974.25 (239.49) n=966
9-12	967.95 (329.42) n=1094	986.69 (331.71) n=1094	1042.29 (282.56) n=1059	1073.70 (301.13) n=1094	997.92 (303.64) n=1164	1022.57 (290.71) n=1149	1047.62 (283.14) n=1125	1094.15 (278.07) n=1062	1040.28 (281.78) n=1084	1065.56 (259.86) n=1057	1079.47 (254.99) n=1029	1106.97 (275.04) n=1154

** All scores presented as the mean and standard deviation - M(SD) - and then sample size (n)*

[12] Scholastic. (2020). *Reading and assessment overview.* Scholastic Reading Inventory. http://teacher.scholastic.com/products/sri_reading_assessment/programoverview.htm
[13] Scholastic Inc. (2007). *SRI technical guide.* https://www.hmhco.com/product-support/content/techsupport/sri/manuals/SRI_Tech_Guide_05_10.pdf
National Center for Education Statistics [NCES]. (2015). *The condition of education: Reading and mathematics score trends.* https://nces.ed.gov/programs/coe/indicator_cnj.asp

Figure 4: Reading Growth as measured by the SRI



Smarter Balanced Assessment Consortium (SBAC) Assessment

Aligned to the Common Core Curriculum, the SBAC measures student performance on English Language Arts (ELA) and math. A digital assessment, the SBAC adapts to the learner - meaning that as learners answer correctly, the questions become more difficult. A summative assessment, the SBAC measures learners' growth from the previous year as well as current college and career readiness[14].

Much like with the DRA and SRI assessments, the SBAC is a scaled score. In California, learners in content levels 3-8 and 11 take the SBAC. Therefore, in this report, learner performance is examined by content level: 3-5, 6-8, and 11. As will be discussed later, to examine the effects of professional learning on learners' SBAC scores, only grades 4-8 will be used so as to have a prior year's score for comparison.

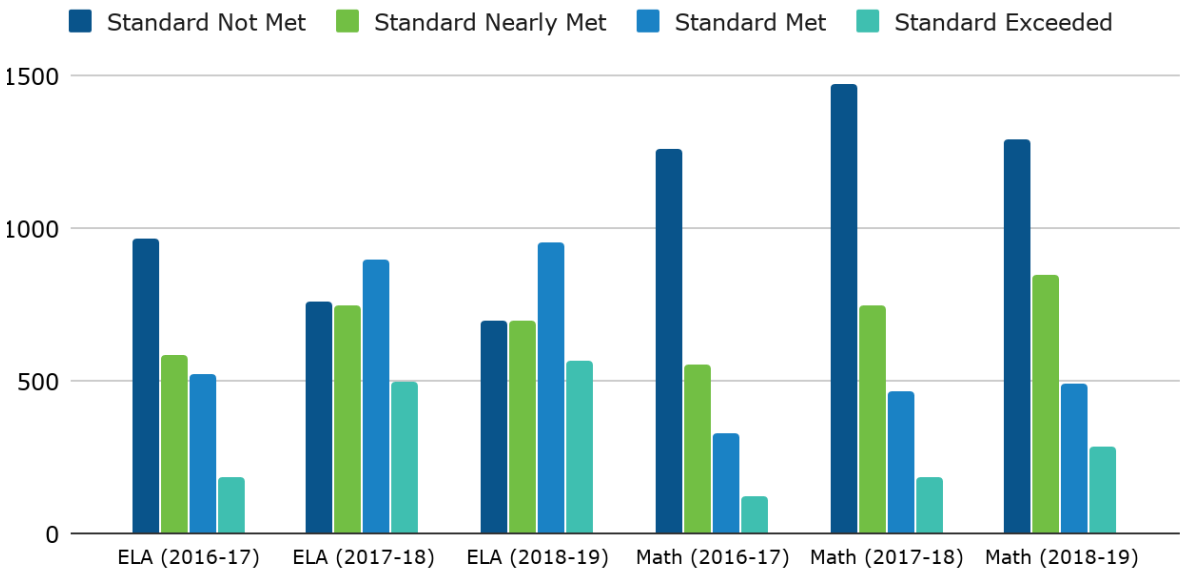
The table below illustrates learner performance on the SBAC for the 2016-2019 School Years by presenting a comparison of the scale scores in ELA and math by content level. To gain a better understanding of learner growth over the three years, the figure then shows the changes in proficiency level across all of the students. For each content level range, different scale scores translate into different proficiency levels.

[14] Smarter Balanced Assessment Consortium. (n.d.). *Smarter assessments*. https://www.smarterbalanced.org/assessments/

Table 7: Descriptive Statistics of SBAC Scores by Content Level

		ELA Scale Scores			Math Scale Scores		
		Y0 (2016-17)	Y1 (2017-18)	Y2 (2018-19)	Y0 (2016-17)	Y1 (2017-18)	Y2 (2018-19)
Content Levels 3-5	Mean	2397.32	2416.86	2436.17	2405.58	2314.93	2427.71
	Std. Deviation	177.128	200.297	168.379	154.841	516.521	213.568
	N	1003	930	907	1003	930	907
Content Levels 6-8	Mean	2503.84	2486.09	2530.85	2480.80	2496.27	2503.14
	Std. Deviation	149.522	342.093	170.544	106.570	103.667	159.244
	N	970	925	940	970	925	940
Content Level 11	Mean	2546.42	2615.48	2606.69	2479.78	2521.98	2521.56
	Std. Deviation	109.382	104.920	106.041	102.077	104.679	136.415
	N	285	276	267	285	276	267

Figure 5: SBAC Performance Levels for ELA and Math by Year



The English Language Proficiency Assessments for California (ELPAC)

A relatively new assessment, The ELPAC replaced the California English Language Development Test (CELDT) test in 2017. It measures the English proficiency of learners who have a different primary language other than English[15]. In LUSD, learners began taking the ELPAC during the 2017-18 School Year. Therefore, data does not exist for learners prior to the start of the TSL grant professional learning.

The ELPAC assesses learners' listening, speaking, reading, and writing proficiency by administering two assessments. Upon entry to the California school system, learners identified by their parents on an entry survey as having a primary language other than English take an initial assessment to determine whether they should be classified as an English Learner. Once a learner has been identified as an English Learner, they take an annual summative assessment to measure their development as well as to determine whether they remain classified as an English Learner or can be reclassified as proficient in English - meaning that they have become a fluent English learner. The ELPAC assessment provides overall scores for Oral and Written Proficiency as well as subscale scores for Listening, Speaking, Reading, and Writing (ELPAC, 2017). LUSD reported scale scores for performance on the overall ELPAC as well as for Oral and Written proficiency.

ELPAC summative scores are weighted based on content level. As learners age, the weighting of the Oral and Written scores changes[16]. Each range of scores then corresponds to a specific performance level: *beginning stage, somewhat developed, moderately developed*, and *well developed*. LUSD's goal is to support as many learners as possible in reaching *well-developed* and into reclassification, meaning they would no longer take the ELPAC assessment. When looking at the overall performance levels, more learners became somewhat or moderately developed. The table below shows the mean scores based on content level, and the figure illustrates the change in performance level.

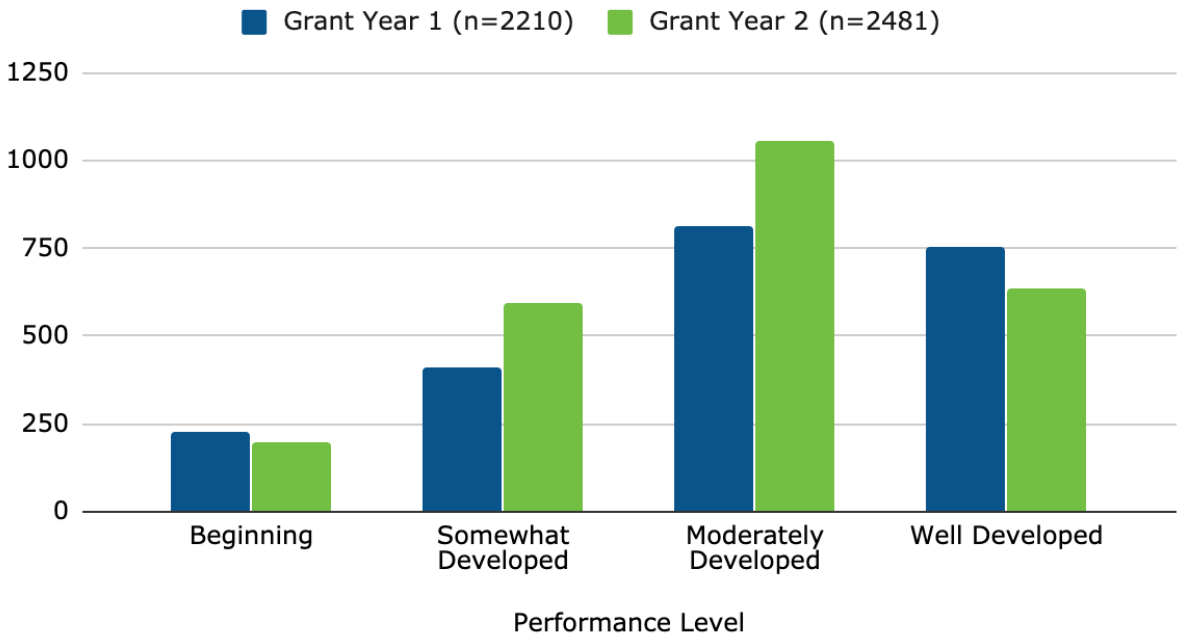
[15] English Language Proficiency Assessments for California (ELPAC). (2017). *Assessment fact sheet.* https://www.elpac.org/s/pdf/ELPAC_Assessment-fact-sheet-english.pdf
[16] English Language Proficiency Assessments for California (ELPAC). (2018). *Binder materials for new ELPAC coordinators.* https://elpac.org/s/pdf/ELPAC--Binder-Materials-for-New-ELPAC-Coordinators.pdf

Table 8: ELPAC Scale Scores

		Grant Year 1 (2017-18)			Grant Year 2 (2018-19)		
		Overall	Oral	Written	Overall	Oral	Written
K-2	Mean	1459.86	1460.71	1445.15	1452.25	1457.54	1440.56
	Std. Deviation	63.808	62.436	159.383	55.094	53.705	76.177
	N	570	570	570	715	715	715
3-5	Mean	1506.41	1502.57	1509.74	1517.20	1508.50	1525.40
	Std. Deviation	42.882	58.823	39.142	46.513	60.051	42.765
	N	416	416	416	409	409	409
6-8	Mean	1548.55	1545.23	1551.43	1553.20	1550.75	1555.09
	Std. Deviation	59.498	79.427	54.694	62.739	85.870	50.916
	N	341	341	341	299	299	299
9-12	Mean	1558.68	1552.47	1564.39	1586.28	1591.69	1580.45
	Std. Deviation	71.706	93.176	67.913	76.107	106.062	59.570
	N	883	883	883	1058	1058	1058

**Grant Year 1 did not include learners in content level 12*

Figure 6: Descriptive Statistics of Change in ELPAC Performance Levels



Across content levels, LUSD scores fell within Level 3, indicating that language proficiency was *moderately developed*. Examination of the change in performance levels therefore provided additional insights into learner development.

It is important to note that 254 learners were reclassified between the two years. In other words, approximately 16.6% of the English Learners from Grant Year 1 (n=1.592) were not included in the sample of English Learners in Grant Year 2 (n=1.532) because they successfully met English Language proficiency and no longer required the designation of *English Learner*. As will be discussed in the next section, the third research question will specifically examine the effects of TSL grant professional learning opportunities on the critical population of English Learners.

Research Questions and Purpose

The purpose of this report is to conduct an initial analysis of the effects of different combinations of various professional learning opportunities (PLOs) on learner growth as measured by formative and summative learner assessment measures. Recognizing that multiple factors influence learner growth, this report will serve as the basis for more in-depth analysis after Year 3 of the TSL grant. As such, three research questions serve as the foundation for this current analysis:

1. **How did engaging in different types of professional learning opportunities (i.e., Focus Institute, Learning Academy, Micro Credential, Site-based Learning Academy, Master's Course, or TIE Online Course) affect learner outcomes?** This initial research question intends to examine whether any particular type of professional learning opportunity had a noticeable effect. Because different learning facilitators participated in professional learning at different times during the school year, the analysis associated with this question will look only at End of Year (EOY) scores. Further, we recognize that many learning facilitators participated in more than one type of professional learning opportunity, so this initial analysis serves as a means to gain an overarching description of what happened during the first two years of the grant.

2. **Which clusters of professional learning opportunities emerged in terms of the combinations of professional learning and in terms of duration (measured in hours)?** Using a statistical modeling strategy called *cluster analysis*, we will identify which combinations of professional learning opportunities emerged in Grant Year 1 and Grant Year 2 based on type and participation. Then, we will determine combinations based on duration - meaning the number of hours that the learning facilitators engaged in professional learning. Results of these cluster analyses will be used to answer the final research question.

3. **Which combinations of professional learning - both in terms of type and duration - had the greatest effect on learner achievement as measured by the various learner assessments, and which combinations had the greatest effect within the English Learner population?** Using the combinations identified in the analysis associated with the second research question, we will then examine the effects on learner growth. Using a combination of formative and summative assessment data, we will conduct two different types of analysis.

    A. Using formative assessment data from the DRA and SRI - both of which include multiple measures within the same year - we will examine the effects of the combinations of professional learning opportunities on learner reading growth.

B. With the summative data from the SBAC, we will look at how participation in the different combinations of professional learning might predict performance in ELA and math.

C. To examine the effects of the various professional learning opportunities specifically on the English Learner population, we will also incorporate the ELPAC assessment. Learners who took the ELPAC during Grant Years 1 and 2 will form a sub-sample. We will then repeat the analyses using the DRA/SRI and SBAC assessments to see which combinations of professional learning specifically improved the growth of this group of learners and also examine the ELPAC data.

The remainder of this report is organized by research question. Each section includes discussion of the analysis procedure as well as the results. The report was prepared following APA 7 Guidelines with some adaptations given the nature of the applied research project.

Analysis and Results: Effects of Professional Learning

Since the start of the TSL grant program, LUSD has sought to determine which professional learning pathways, or combinations of professional learning opportunities, ultimately led to improved learner growth. This report serves as an initial analysis to understand the effect of different types of professional learning on the aforementioned learner assessments. Future reports will build on this analysis, expand the data used to measure learner growth, and account for various site-based conditions and learning facilitator attributes.

RQ1: How did engaging in different types of professional learning affect learner outcomes?

During the two years of the TSL grant, learning facilitators in LUSD could choose from a menu of professional learning opportunities (PLOs). These different offerings ranged in terms of topic, level of development, time commitment, and performance-based compensation. This first research question sought to determine whether participation in any particular type of professional learning (e.g., Focus Institute, Learning Academy, etc.) had an effect on learners' growth in reading, ELA, or math.

To conduct this analysis, dichotomous variables (yes/no) were computed to indicate participation in each type of professional learning. These new variables could then be used to look for any variation in mean scores, by school year, on each of the learner assessments based on the content level range of the learners (K-2, 3-5, 6-8, and 9-12).

Effects of Professional Learning on Reading

As previously discussed, LUSD measures reading growth by using the Developmental Reading Assessment (DRA) in K-2 and the Scholastic Reading Inventory (SRI) for content levels 3-12. Although later analyses will use these scores to determine the effects of different combinations of professional learning on learner growth trajectories, this first research question sought to determine whether the discrete professional learning opportunities had an effect on the learners End of Year (EOY) Lexile levels.

Analysis of DRA Scores

Learners in K-2 take the DRA multiple times during the school year as well as at the end of the year. Table 9 compares the End of Year Lexile levels for learners in K-2 based on the learning facilitators' participation in the different professional learning opportunities.

When looking at learner performance based on the professional learning of their learning facilitator, a few trends emerged:

- Learning facilitators who took Masters' Courses had students with the lowest DRA scores. However, there was some improvement during the 2018-19 School Year, and they had the smallest possible sample size.
- Those who participated in Micro Credentials saw the greatest gains between years one and two of the grant, and also the biggest changes in terms of numbers of participants. In Grant Year 1, 68 learning facilitators engaged in Micro Credentials as compared to 297 in Grant Year 2.
- When focusing on Grant Year 2 alone, which had the higher rate of participation as well as a substantially greater number of possible opportunities, little variation in scores could be detected with the exception of the Masters' Courses.

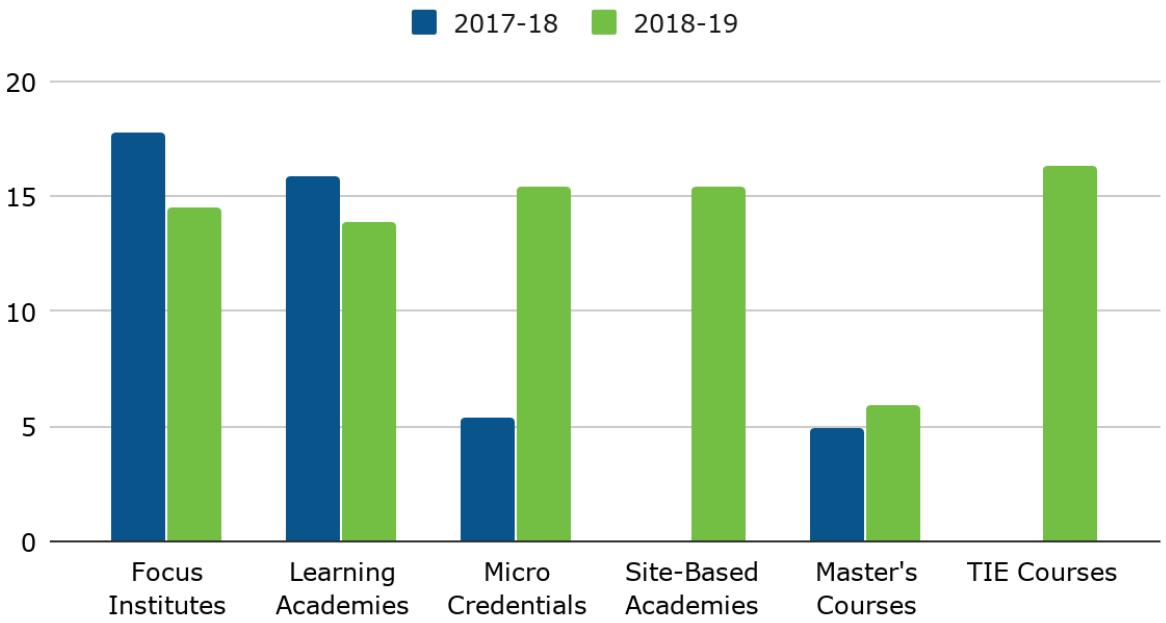
Key Consideration: *When examining these scores, it is important to note that the number of learning facilitators who participated in each opportunity varied considerably. As mentioned, over four times as many learning facilitators completed Micro Credentials in Grant Year 2 as Grant Year 1. This could certainly affect the scores. Similarly, fewer learning facilitators completed Master's Courses than either Focus Institutes and Learning Academies. This in itself could also contribute to the variation in scores. In addition, many learning facilitators participated in more than one opportunity. The analysis conducted later in this report will further explore these discrepancies.*

Table 9: DRA End of Year Lexile Levels for K-2

		2017-18	2018-19
Focus Institutes	Mean	17.72	14.50
	Std. Deviation	12.849	10.662
	N	675	823
Learning Academies	Mean	15.86	13.86
	Std. Deviation	13.500	10.516
	N	601	696
Micro Credentials	Mean	5.37	15.44
	Std. Deviation	3.785	11.71
	N	68	297
Site-based Learning Academies	Mean	NA	15.44
	Std. Deviation		11.708
	N		297
Master's Courses	Mean	4.95	5.93
	Std. Deviation	3.442	4.96
	N	21	27
TIE Courses	Mean	NA	16.31
	Std. Deviation		8.97
	N		52

**n = the number of learner scores counted per PLO type*

Figure 7: K-2 DRA Scores by Professional Learning Opportunity



Analysis of SRI Scores

With content levels 3-12, LUSD uses the interim scores from the SRI to measure reading growth. Because the SRI is a criterion-referenced scaled score[17], the three content level ranges were examined separately to make more accurate comparisons. The analysis then compares the learners' End of Year Lexile levels for each professional learning opportunity by content level. Table 10 presents the mean scores for each PLO as well as the number of learner scores used to make that calculation.

When looking at the data for learners in content levels 3-5, there appears to be little difference in the scores with the exception of the TIE Courses. Although the TIE Course appeared to have a substantially larger effect on learners' scores when compared to the other professional learning opportunities, the relatively small number of learning facilitators who engaged in these courses, combined with the potential that they also completed other types of professional learning, means that we cannot make any overarching inferences.

With content levels 6-8 and 9-12, there did not appear to be any major differences between the scores based on the type of professional learning opportunity. Further, because the Site-based Learning Academies were only offered within K-8 learning communities, learning facilitators who teach in content levels 9-12 could not participate. Figures 7-9 illustrate the trends in EOY Lexile scores for the different content level ranges. In general, the individual PLO types had very little effect on learners' EOY Lexile scores.

[17] Scholastic Inc. (2019). *Scholastic Reading Inventory research summary.* http://teacher.scholastic.com/products/product_info/pdf/SRI_Research%20Summary_Revised.pdf

Table 10: SRI End of Year Lexile Levels by Content Level

PLO Type	Content Level	2017-18	2018-19
Focus Institutes	**3-5**	716.95 (238.25) n=659	735.58 (242.23) n=740
	6-8	967.22 (232.12) n=502	989.83 (236.46) n=736
	9-12	1112.77 (274.97) n=1920	1104.32 (280.21) n=2614
Learning Academies	**3-5**	701.62 (229.84) n=518	741.62 (231.02) n=708
	6-8	962.95 (209.97) n=217	992.96 (224.24) n=631
	9-12	1062.47 (324.69) n=1089	1099.48 (303.27) n=2050
Micro Credentials	**3-5**	703.33 (212.05) n=210	736.43 (247.17) n=395
	6-8	974.66 (224.10) n=184	1007.13 (228.84) n=444
	9-12	1163.39 (206.05) n=734	1104.67 (284.93) n=2418
Site-based Learning Academies	**3-5**	NA	711.34 (237.76) n=717
	6-8	NA	968.97 (234.45) n=753
	9-12	NA	NA
Master's Courses	**3-5**	690.55 (234.22) n=105	725.16 (236.88) n=160
	6-8	973.70 (196.61) n=167	1003.04 (176.14) n=188
	9-12	989.23 (430.15) n=235	1119.81 (287.45) n=1183
TIE Courses	**3-5**	NA	987.36 (192.89) n=25
	6-8	NA	984.94 (138.94) n=53
	9-12	NA	1053.41 (247.68) n=324

** scores presented as mean(standard deviation)*

***n = the number of learner scores counted per PLO type*

Key Consideration: *As with the DRA analysis, it is important to remember that most learning facilitators completed more than one professional learning opportunity. Therefore, it is difficult to attribute learner growth to any one type based on this analysis. Additionally, not all professional learning addressed reading instruction, so it is not logical to make broader inferences based solely on learners' reading scores.*

Figure 8: 3-5 SRI Scores by Professional Learning Opportunity

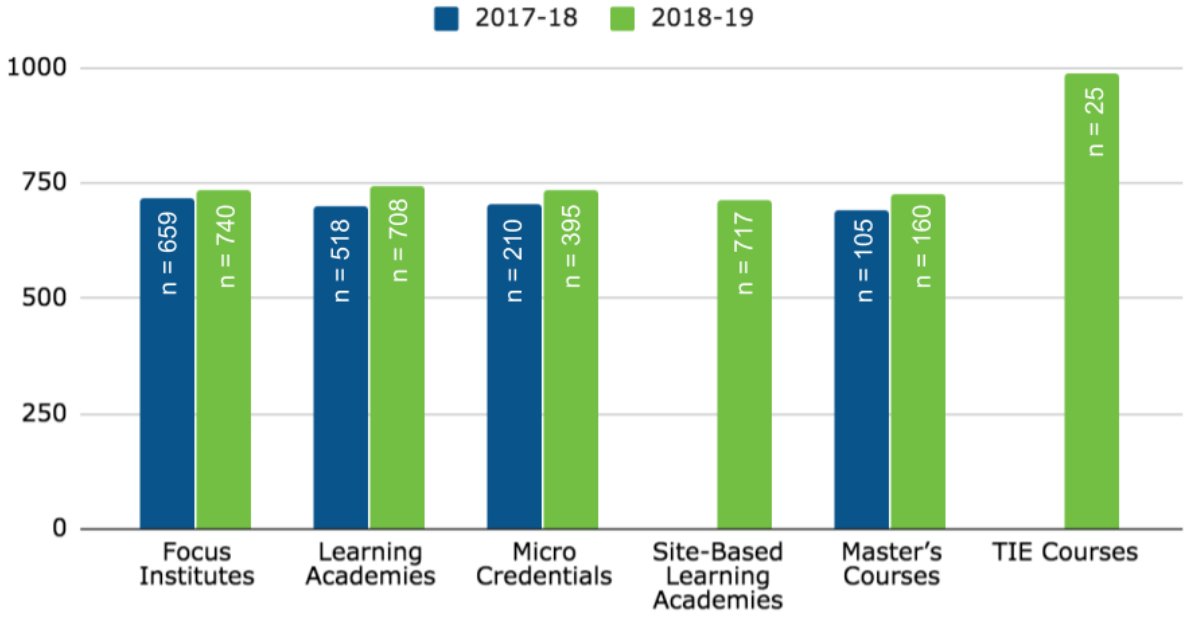


Figure 9: 6-8 SRI Scores by Professional Learning Opportunity

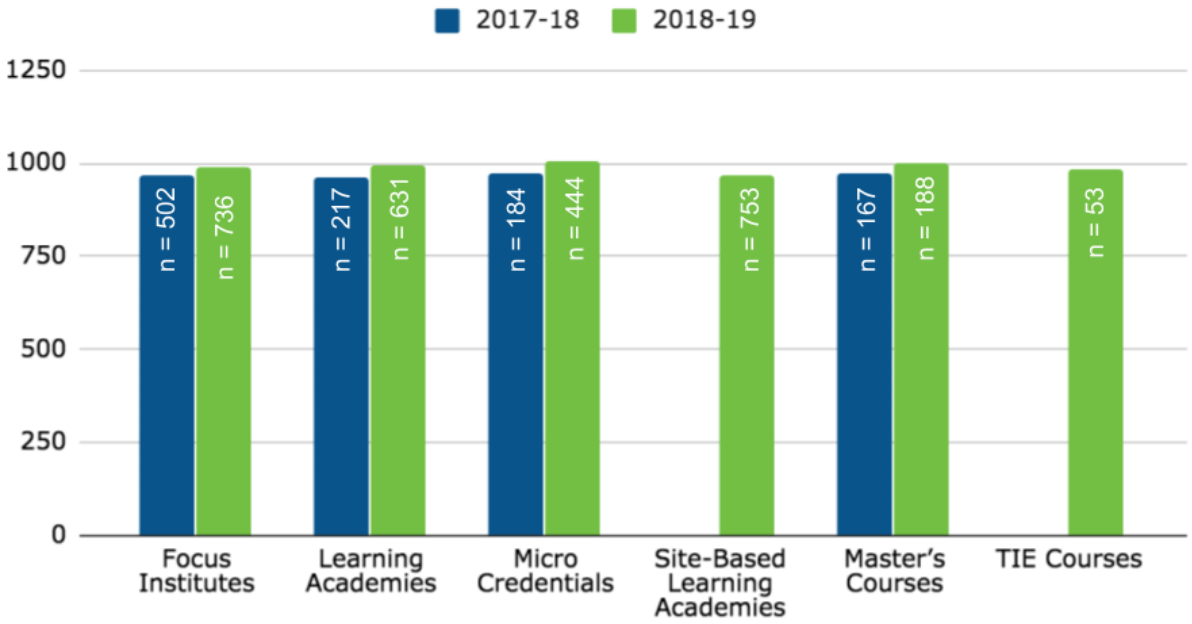
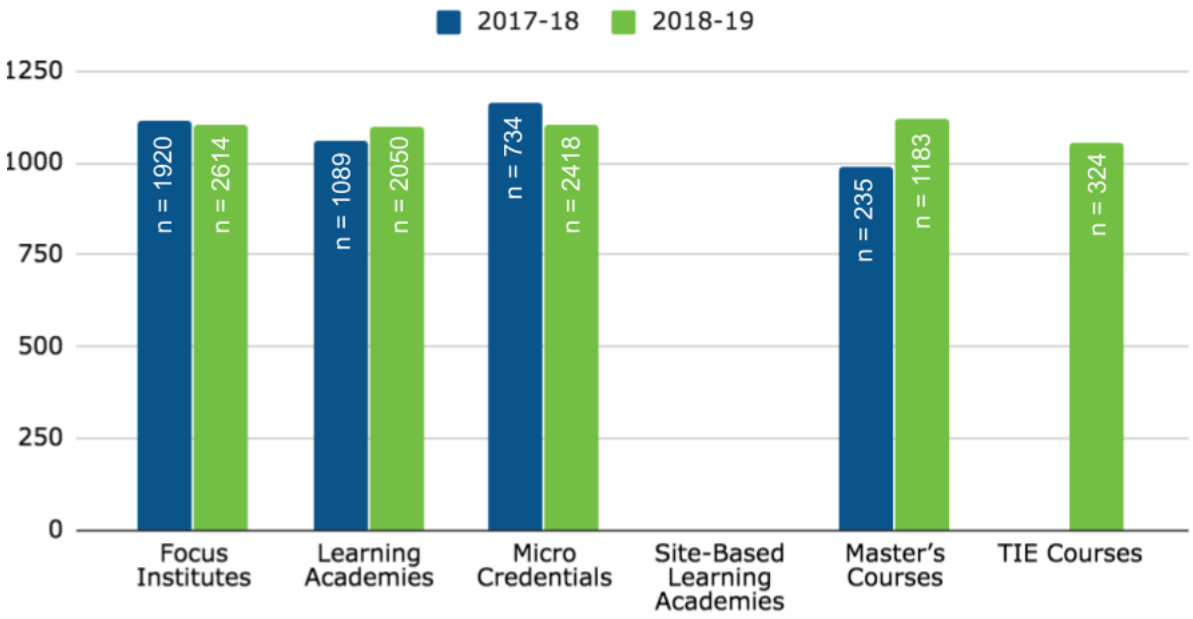


Figure 10: 3-5 SRI Scores by Professional Learning Opportunity



Effects of Professional Learning on ELA and Math Performance

The Smarter Balanced Assessment Consortium (SBAC) Assessment served as a summative measure of learner growth in ELA and math for all learners in content levels 3-8 as well as 11. Not only is the SBAC a scaled score - meaning that learners in higher content levels are expected to score higher - but it is also an adaptive assessment. As students answer questions correctly, the content becomes more difficult[18]. For these reasons, we analyzed the effects of each professional learning type on learner performance by content level (3-5, 6-8, and 11).

It is important to note the varying sample sizes for each group in the analysis. For example, because more learning facilitators participated in Focus Institutes versus Master's Courses, more student scores factored into the analysis. Additionally, TIE Courses and Site-based Learning Academies were not offered during the first year of the TSL grant, and the latter only occurred within K-8 learning communities.

When examining the effects of the various professional learning opportunities across the different content levels, a few trends emerged.

- Very little variation between the scores can be observed, particularly in content levels 6-8, implying that none of the discrete professional learning opportunities substantially affected learner outcomes.

[18] Smarter Balanced Assessment Consortium. (n.d.). *Smarter assessments.* https://www.smarterbalanced.org/assessments/

- In content levels 3-5, learners made more gains in math between the two school years when their learning facilitators participated in either Learning Academies or Micro Credentials. This trend may need to be further explored in later reports.
- Learning facilitators who participated in TIE courses had learners who performed well on the SBAC in both ELA and math.
- In content level 11, learners whose learning facilitators completed Master's Courses did improve their ELA scores between Grant Year 1 and Grant Year 2. With Focus Institutes, Learning Academies, and Micro Credentials, ELA scores decreased between the two grant years.

Across content levels, with both the ELA and math scores, there appeared to be very little variation in terms of the effects of the different PLO types. Later analyses in this report will expand on these findings to gain a deeper understanding of the varying effects.

Table 11: SBAC Scores by PLO Type and Content Level

		ELA Scale Score		Math Scale Score	
		2017-18	2018-19	2017-18	2018-19
Focus Institutes	3-5	2426.95 (162.84) n=669	2436.92 (175.89) n=811	2381.63 (346.30) n=669	2433.18 (189.60) n=811
	6-8	2479.67 (397.96) n=504	2539.72 (161.96) n=722	2504.08 (106.98) n=504	2514.98 (141.40) n=722
	11	2616.82 (101.89) n=501	2602.63 (106.38) n=642	2526.61 (104.55) n=501	2519.41 (112.14) n=642
Learning Academies	3-5	2410.12 (204.40) n=524	2443.62 (157.08) n=739	2328.43 (471.54) n=524	2436.13 (196.49) n=739
	6-8	2451.31 (454.46) n=220	2545.4 (91.91) n=621	2494.44 (99.03) n=220	2519.74 (106.66) n=621
	11	2645.14 (96.44) n=137	2615.75 (104.97) n=414	2566.43 (99.01) n=137	2531.41 (109.85) n=414
Micro Credentials	3-5	2427.72 (86.67) n=211	2449.97 (90.34) n=385	2315.24 (523.47) n=211	2440.9 (148.69) n=385
	6-8	2442.8 (493.21) n=186	2553.18 (90.19) n=438	2511.28 (108.68) n=186	2524.97 (160.69) n=438
	11	2607.35 (100.39) n=187	2594.5 (105.90) n=461	2527.63 (103.58) n=187	2506 (109.56) n=461
Site-based Learning Academies	3-5	NA	2432.75 (177.13) n=787	NA	2421.21 (226.45) n=787
	6-8	NA	2531.54 (184.75) n=734	NA	2500.5 (168.37) n=734
	11	NA	NA	NA	NA
Master's Courses	3-5	2413.32 (252.73) n=103	2429.51 (214.63) n=156	2355.23 (416.67) n=103	2444.4 (80.84) n=156
	6-8	2534 (89.76) n=168	2539.35 (88.02) n=189	2513.05 (92.50) n=168	2518.67 (103.02) n=189
	11	2615.27 (96.67) n=33	2618.21 (98.98) n=195	2525.3 (135.18) n=33	2525.56 (108.24) n=195
TIE Courses	3-5	NA	2521.57 (79.66) n=23	NA	2518.61 (88.22) n=23
	6-8	NA	2534.09 (83.94) n=53	NA	2492.79 (108.68) n=53
	11	NA	2515 (102.96) n=6	NA	2435 (71.59) n=6

** Scores presented as Mean (Standard Deviation)*

***n = the number of learner scores counted per PLO type and content level*

Figure 11: Comparison of Performance on SBAC by PLO Type for Content Levels 3-5

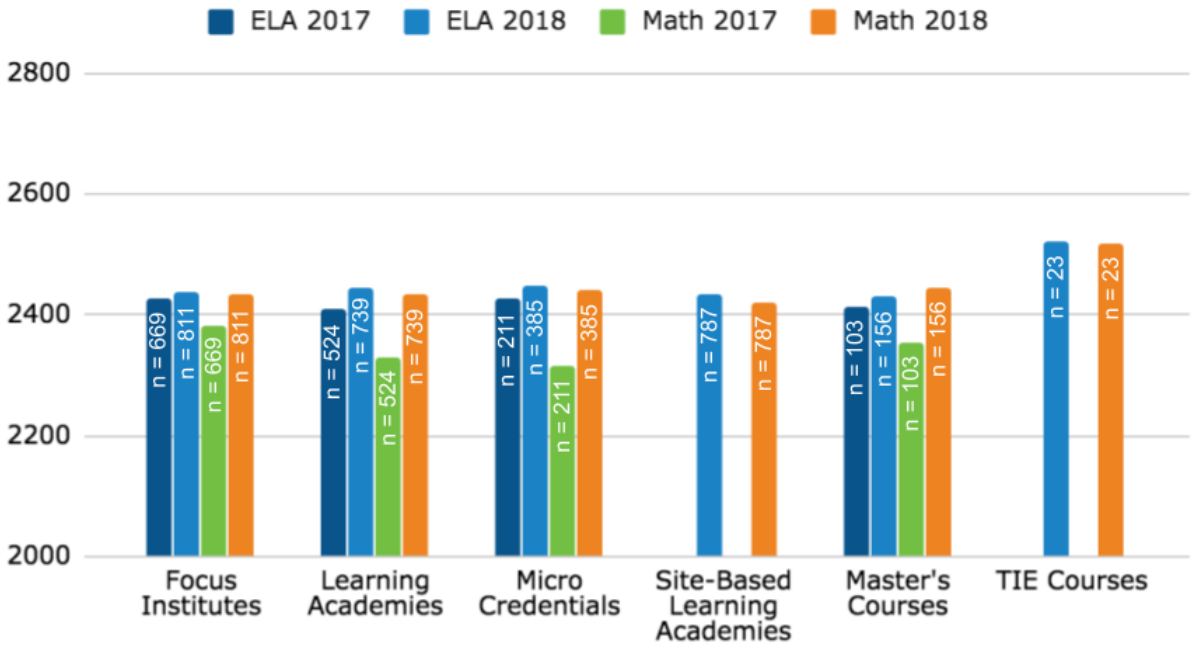


Figure 12: Comparison of Performance on SBAC by PLO Type for Content Levels 6-8

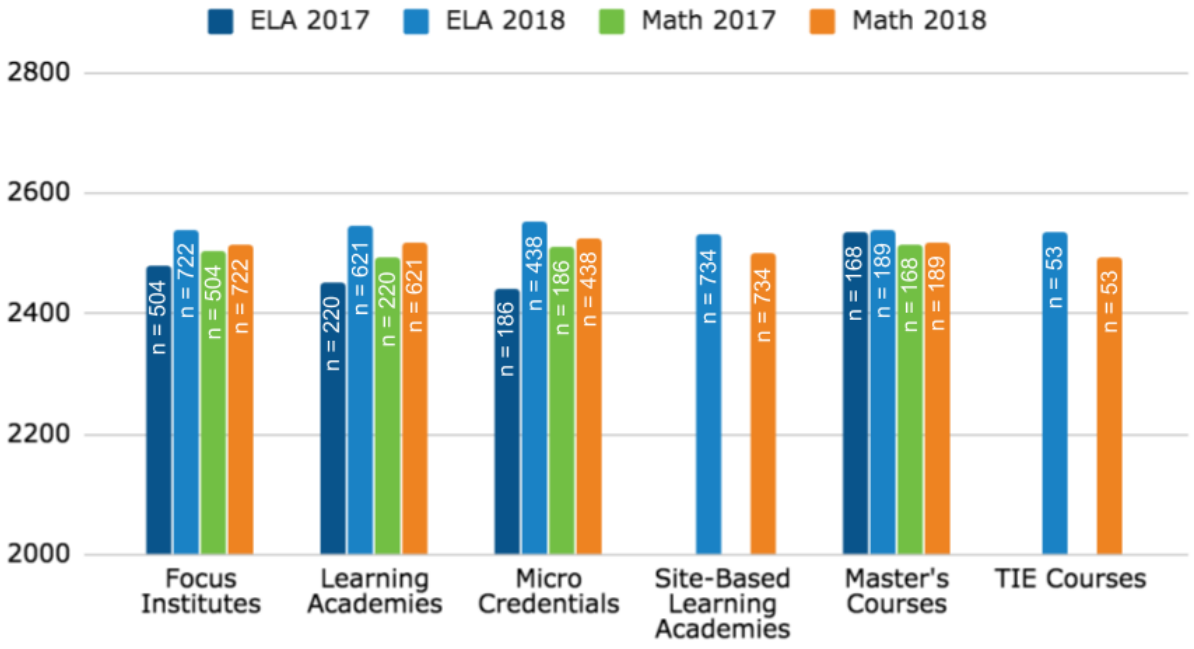
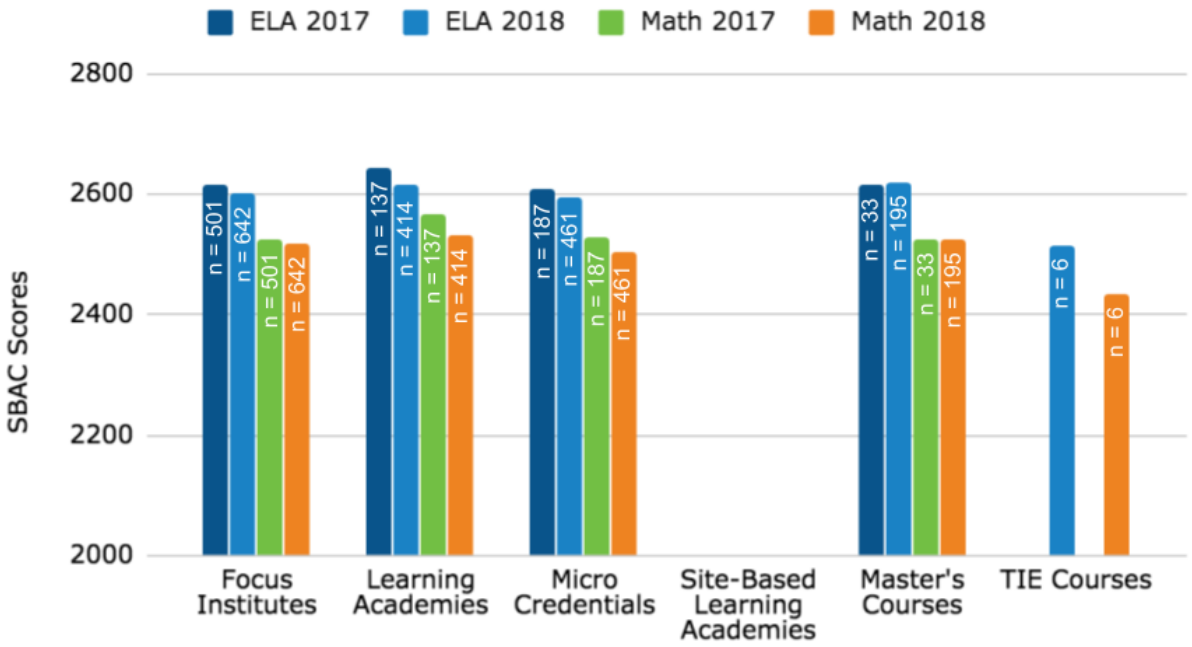


Figure 13: Comparison of Performance on SBAC by PLO Type for Content Level 11



Research Question #1 Conclusions

The first research question, ***how did engaging in different types of professional learning affect learner outcomes?,*** allowed us to broadly examine the impact of the distinct professional learning opportunities on learner growth. Using a combination of formative reading assessments as well as summative assessments for ELA and math, we were able to examine learner performance based on the participation of their learning facilitator in the distinct PLO types.

With a few exceptions, this analysis revealed very little variation in learner growth based on learning facilitator participation in the different professional learning opportunities. We attribute this to two key factors.

- **This analysis considered participation to be dichotomous** - either a *yes* or a *no*. However, many learning facilitators participated in multiple opportunities both within types (i.e., more than one Focus Institute) and across them (e.g., multiple Focus Institutes and at least one other opportunity). Therefore, using the professional learning opportunity types as discrete variables only provides an initial glimpse into the data.
- **Wide variation existed within the sample sizes.** For example, substantially fewer learning facilitators completed TIE or Master's Courses as compared to Focus Institutes and Site-based Learning Academies. These discrepancies in sample size could introduce bias into the analysis of the data.

RQ1 Key Take-Away

When looking at the different professional learning opportunities individually, no single PLO type substantially impacted learners' growth across the various measures.

The following research questions will expand on this analysis and examine the effects of different combinations of professional learning. To answer the second research question, we used cluster analysis to statistically determine the most prevalent combinations of professional learning based on PLO type and duration. We then used those defined clusters to examine their effect on learner growth to answer the third research question.

RQ2: Which clusters of professional learning opportunities emerged in terms of the combinations of professional learning and also in terms of duration (measured in hours)?

Since learning facilitators participated in multiple professional learning opportunities during the two TSL grant years, we conducted analyses to identify groups who demonstrated similar patterns of participation. We broke this second research questions into two parts:

- **RQ2a:** which combinations of PLOs emerged in Year 1 and Year 2 based on type (e.g., Focus Institute, Learning Academy, etc.)?
- **RQ2b:** which combinations emerged based on dosage, which was measured as duration in hours?

To examine these patterns in the data, we used k-means cluster analysis, which employs an iterative algorithm to determine the optimal number of clusters that are present in the data. The objective of this exploratory approach was to classify learning facilitators into clusters based on similarities in engagement both in terms of the types of professional learning opportunities and the duration of time spent engaged in professional learning.

After completing each cluster analysis, we ran a discriminant analysis for each sub-question to determine the quality of the model fit, meaning the statistical likelihood that the analysis adequately placed the learning facilitators into the correct combinations. This discriminant analysis also allowed us to statistically determine the optimum number of clusters for examination per school year.

RQ2a: Combinations Based on PLO Type

In this report, we analyzed Grant Year 1 (School Year 2017-18) and Grant Year 2 (School Year 2018-19) separately, resulting in two different sets of combinations. We made this decision

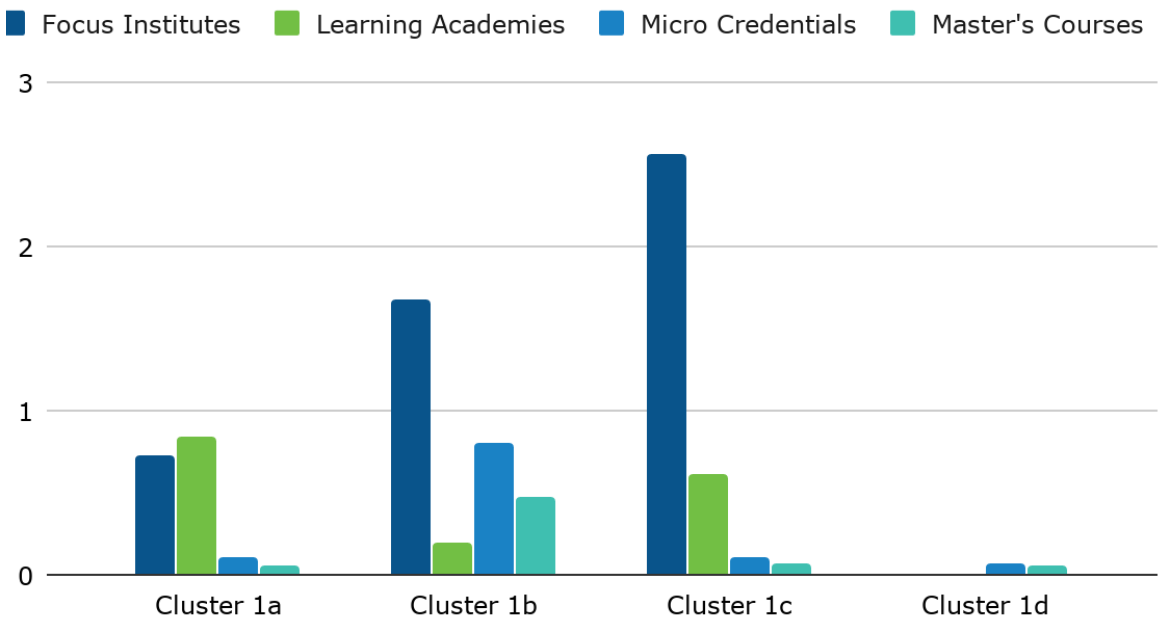
because different types and numbers of opportunities were made available to the learning facilitators over time. Site-based Learning Academies and TIE Courses were not offered during Grant Year 1, and learning facilitators could choose from a larger menu of Focus Institutes and Learning Academies in Grant Year 2.

In the analysis, each cluster consists of distinct combinations of professional learning opportunities as well as different combinations of learning facilitators based on content level. The different PLOs are represented as their type as well as their mean (M) count. Many learning facilitators completed more than one of the various professional learning opportunities, and the cluster analysis factored that into the model. The model also accounted for zeroes in the dataset, so many of the PLO types with lower participation rates have their means represented as decimals even though learning facilitators did not complete a fraction of a PLO.

Grant Year 1 (2017-18 School Year) Clusters

For Grant Year 1, we used combinations of participation in four PLOs (i.e., Focus Institutes, Learning Academies, Micro Credentials, and Master's Courses) as input to form the clusters. In each case, after conducting the cluster analysis with multiple numbers of potential clusters, we tested the final solutions using discriminant analysis. In addition to enabling us to examine group differences across clusters, the discriminant analysis provided cross-validation by determining the extent to which we could statistically predict cluster assignment based on participation in the various professional learning opportunities. In Grant Year 1, the discriminant analysis determined that the model would best fit using four distinct clusters (k=4).

Figure 14: Illustration of the Grant Year 1 Clusters by PLO Type



Each cluster had a unique combination, both in terms of the PLO types and the composition of learning facilitators as described below. Appendix B includes additional information about participation by learning community within each cluster.

- **Cluster 1a (n=44)** - Over 72% of this cluster consisted of learning facilitators who work with elementary learners. In addition to containing the largest group of K-2 learning facilitators (22), it also included the smallest group of those who teach 6-8. All learning facilitators in this cluster participated in at least one the available professional learning opportunities. Collectively, they completed 32 Focus Institutes, 37 Learning Academies, 5 Micro Credentials, and 2 Master's Courses. In total, they completed 76 PLOs.

- **Cluster 1b (n=15) -** The smallest cluster in terms of size, it did not include any learning facilitators in K-2. Approximately half of the cluster consisted of 6-8 learning facilitators with the other half evenly split between 3-5 and 9-12. Like with Cluster 1a, all learning facilitators participated in at least one of the PLO types, and collectively, they completed 25 Focus Institutes - with multiple learning facilitators completing more than one professional learning opportunity. In total, they completed 37 PLOs: 25 Focus Institutes, 3 Learning Academies, 12 Micro Credentials, and 7 Master's Courses.

- **Cluster 1c (n=46) -** Consisting predominantly of elementary learning facilitators, this is both the largest cluster and the one that completed the most Focus Institutes. The learning facilitators in this cluster completed 122 Focus Institutes, 31 Learning Academies, 5 Micro Credentials, and 3 Master's Courses. In total, they completed 161 PLOs - almost twice the number completed by Cluster 1a, four times that of Cluster 1b, and 32 times that of Cluster 1d.

- **Cluster 1d (n=44) -** With the highest proportion of learning facilitators from the high school, this cluster completed the fewest professional learning opportunities. It is important to recognize that *39 of 44 learning facilitators in this cluster did not complete any professional learning*. The remaining five learning facilitators completed three Micro Credentials and two Master's Courses.

The table and figure below describe the composition of each cluster by content level and PLO type. In general, Clusters 1a and 1b had learning facilitators who completed a range of different professional learning opportunities. Cluster 1c, of which over 62% of the learning facilitators could be considered elementary educators, was both the largest cluster and the most active in terms of engaging in multiple Focus Institutes. Finally, Cluster 1d represents those who did not engage in professional learning or decided to complete a more in-depth experience via a Micro Credential or Master's Course.

Table 12: Cluster Demographics by Learning Facilitator Content Level for Grant Year 1

Content Level	Cluster 1a n=44	Cluster 1b n=15	Cluster 1c n=46	Cluster 1d n=44
K-2	22 (50.0%)	0 (0.0%)	16 (34.8%)	7 (15.9%)
3-5	10 (22.7%)	4 (26.7%)	13 (28.3%)	6 (13.6%)
6-8	5 (11.4%)	7 (46.7%)	7 (15.2%)	12 (27.3%)
9-12	7 (15.9%)	4 (26.7%)	10 (21.7%)	19 (43.2%)

Figure 15: Heat Map of PLO Types by Cluster for Grant Year 1

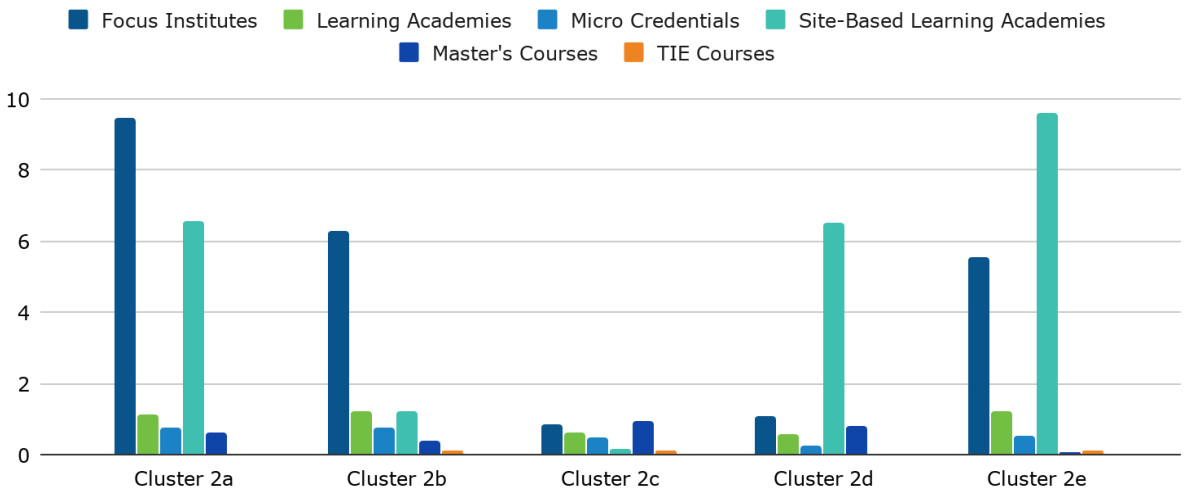
	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Cluster 1a	0.73	0.84	0.11	0.05
Cluster 1b	1.67	0.2	0.8	0.47
Cluster 1c	2.56	0.61	0.11	0.07
Cluster 1d	0	0	0.07	0.05

Grant Year 2 (2018-19 School Year) Clusters

During Grant Year 2, learning facilitators in LUSD could choose to participate in an even greater number of professional learning opportunities. In addition to an expanded number of Focus Institutes, Learning Academies, Micro Credentials, and Master's Courses, the district also offered Site-based Learning Academies and TIE Courses (see Table 1 for a review of the types of PLOs). This expanded set of PLO types served as the input to form the clusters during Grant Year 2.

Following the same procedure as with Grant Year 1, after conducting the cluster analysis with multiple numbers of potential clusters, we tested the final solutions using discriminant analysis. In Grant Year 2, the discriminant analysis determined that the model would best fit using five distinct clusters (k=5).

Figure 16: Illustration of the Grant Year 2 Clusters by PLO Type



Similar to Grant Year 1, each cluster had unique characteristics in terms of the content levels of the learning facilitators as well as the number and type of professional learning opportunities. Since more opportunities were made available during the 2018-19 school year, the average number completed was substantially higher as was the participation rate amongst the learning facilitators.

- **Cluster 2a (n=26) -** Over 75% of the learning facilitators in this cluster teach elementary content levels with the remaining 23% supporting 6-8 learners. The learning facilitators in this cluster largely participated in Focus Institutes and Site-based Learning Academies. Since the latter were only offered within K-8 learning communities, this could account for the lack of 9-12 learning facilitators in this cluster. In addition to collectively completing 246 Focus Institutes and 171 Site-based Learning Academies, the learning facilitators in this cluster also participated in 29 Learning Academies, 20 Micro Credentials, 16 Master's Courses, and 1 TIE Course for a total of 483 different PLOs.

- **Cluster 2b (n=26) -** Of all the clusters, this one had the most balanced composition between the four content level ranges. Although learning facilitators completed fewer numbers of PLOs, each participated in at least one type by the end of Year 2. Collectively, learning facilitators completed 163 Focus Institutes, 32 Learning Academies, 20 Micro Credentials, 32 Site-based Learning Academies, 10 Master's Courses, and 3 TIE Courses for a total of 260 different PLOs.

- **Cluster 2c (n=40) -** Not only was this the largest cluster, and the one with the greatest number of learning facilitators in the high school, but it also had the lowest PLO completion rate. Fourteen of the 40 learning facilitators in this cluster did not participate in any professional learning opportunities. The remaining 26 learning facilitators completed 34 Focus Institutes, 24 Learning Academies, 19 Micro Credentials, 6

Site-based Learning Academies, 38 Master's Courses, and 4 TIE courses. In total, they completed 125 PLOs.

- **Cluster 2d (n=24) -** Similar to Cluster 2a, all of the learning facilitators in this cluster support K-8 learning communities and half support elementary learners although they participated in approximately half of the total number of professional learning opportunities (222 as compared to 483). Combined, learning facilitators in Cluster 2d participated in 15 Focus Institutes, 14 Learning Academies, 6 Micro Credentials, 56 Site-based Learning Academies, 19 Master's Courses, and 1 TIE course.
- **Cluster 2e (n=31) -** Comprised of only K-8 learning facilitators, over 80% of whom support elementary learners, this cluster completed the most number of distinct professional learning opportunities. In total, they participated in 529 different PLOs including 172 Focus Institutes, 38 Learning Academies, 17 Micro Credentials, 297 Site-based Learning Academies, 2 Master's Courses, and 3 TIE Courses.

Additional details about each cluster can be found in the table and figure below. Unlike in Grant Year 1, learning facilitators of learners in content levels 9-12 appeared predominantly in Clusters 2b and 2c. Both of those clusters completed fewer professional learning opportunities. On the contrary, Clusters 2a, 2d, and 2e consisted entirely of K-8 learning facilitators who participated in higher numbers of lower-commitment professional learning opportunities (Focus Institutes and Site-based Learning Academies).

Table 13: Cluster Demographics by Learning Facilitator Content Level for Grant Year 2

Content Level	Cluster 2a n=26	Cluster 2b n=26	Cluster 2c n=40	Cluster 2d n=24	Cluster 2e n=31
K-2	13 (50.0%)	7 (26.9%)	2 (5.0%)	6 (25.0%)	16 (51.6%)
3-5	7 (26.9%)	6 (23.1%)	5 (12.5%)	7 (29.2%)	10 (32.3%),
6-8	6 (23.1%)	4 (15.4%)	6 (15.0%)	11 (45.8%)	5 (16.1%)
9-12	0 (0.0%)	9 (34.6%)	27 (67.5%)	0 (0.0%)	0 (0.0%)

Figure 17: Heat Map of PLO Types by Cluster for Grant Year 2

	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Cluster 2a	9.46	1.12	0.77	6.58	0.62	0.04
Cluster 2b	6.27	1.23	0.77	1.23	0.38	0.12
Cluster 2c	0.85	0.6	0.48	0.15	0.95	0.1
Cluster 2d	1.08	0.58	0.25	6.5	0.79	0.04
Cluster 2e	5.55	1.23	0.55	9.58	0.06	0.1

RQ2b: Combinations Based on Duration (Dose in Hours)

As mentioned previously in this report, existing literature has found a positive relationship between increased duration of professional learning and improved student outcomes[19]. Therefore, in addition to examining clusters based on the type of PLO, we also identified clusters based on dose - the amount of time, in hours, that learning facilitators spent engaged in professional learning regardless of type. As with Research Question 2a, we analyzed Grant Year 1 (School Year 2017-18) and Grant Year 2 (School Year 2018-19) separately.

Each professional learning opportunity varies in terms of its duration. From 3-hour Site-based Learning Academies to 40-hour per week Master's Courses, learning facilitators had varying *doses* of professional learning depending on the type of PLO in which they participated and the number of distinct opportunities that they completed. The time, in hours, of each PLO then served as the input to form the clusters. As with Research Question 2a, after conducting the cluster analysis with multiple numbers of potential clusters, we tested the final solutions using

[19] Dede, C., Ketelhut, D., Whitehouse, P., Breit, L., McCloskey, E. (2008). *A Research agenda for online teacher professional development. Journal of Teacher Education, 60*(1), 8 - 19. https://dx.doi.org/10.1177/0022487108327554
Didion, L., Toste, J., Filderman, M. (2019). Teacher professional development and student reading achievement: A meta-analytic review of the effects. *Journal of Research on Educational Effectiveness, 13*(1), 29-66. https://dx.doi.org/10.1080/19345747.2019.1670884
Penuel, W., Fishman, B., Yamaguchi, R., Gallagher, L. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921 - 958. https://dx.doi.org/10.3102/0002831207308221
Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. L. (2007). Reviewing the Evidence on How Teacher Professional Development Affects Student Achievement. Issues & Answers. REL 2007-No. 033. *Regional Educational Laboratory Southwest (NJ1)*. https://files.eric.ed.gov/fulltext/ED498548.pdf

discriminant analysis to validate the extent to which we could statistically predict cluster assignment.

Grant Year 1 (2017-18 School Year) Clusters

Once again, in Grant Year 1, the discriminant analysis determined that the model would best fit using four distinct clusters (k=4). We then determined the average duration, measured in hours, for each cluster to get a sense of the amount of time spent engaged in professional learning. Figure 16 compares the average duration for each cluster in hours and ranks them from High to Low. Figure 17 then illustrates the composition of each cluster by size, content level range, average duration, and total hours of professional learning collectively completed. Unsurprising, the two lower duration clusters had the highest number of learning facilitators.

Figure 18: Illustration of Average Duration of Professional Learning (Dose in Hours) per Cluster for Grant Year 1

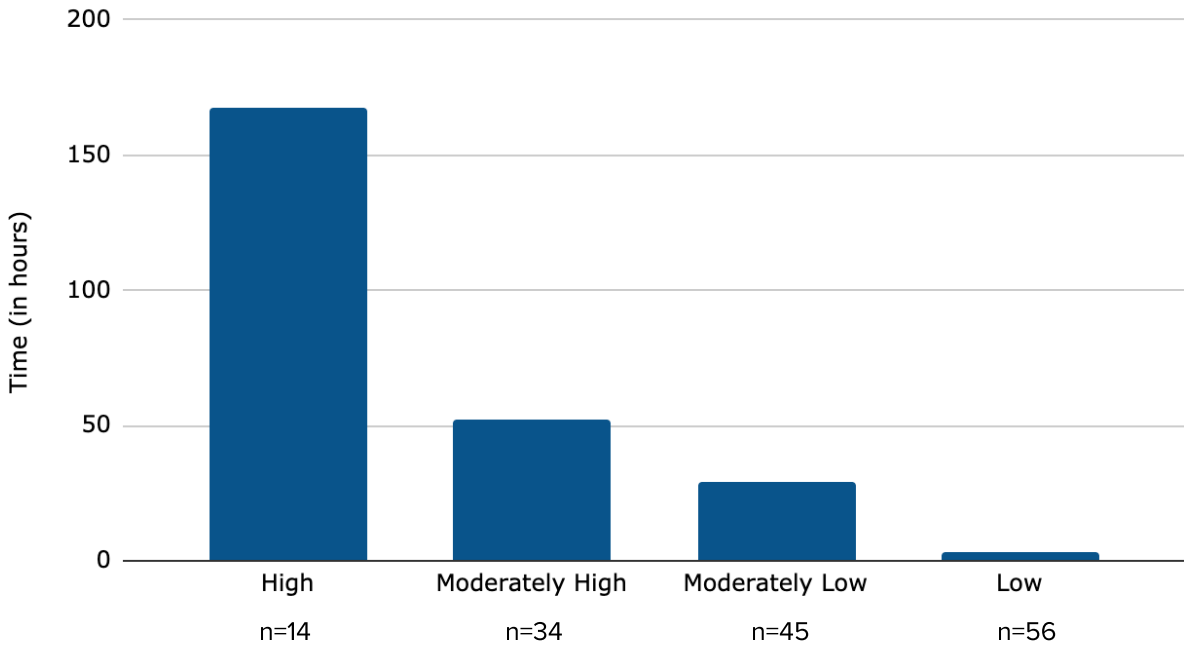


Figure 19: Cluster Composition by Content Level and Duration

	K-2 # (%)	3-5 # (%)	6-8 # (%)	9-12 # (%)	Mean Duration (SD)	Total Hours Completed
High (*n* = 14)	1 (7.1%)	5 (35.7%)	5 (35.7%)	3 (21.4%)	167.6 (21.4)	2,346
Moderately High (*n* = 34)	9 (26.5%)	8 (23.5%)	8 (23.5%)	9 (26.5%)	52.1 (10.2)	1,770
Moderately Low (*n* = 45)	21 (46.7%)	10 (22.2%)	6 (13.3%)	8 (17.8%)	29.3 (5.9)	1,320
Low (*n* =56)	14 (25.0%)	10 (17.9%)	12 (21.4%)	20 (35.7%)	2.9 (4.6)	162

Grant Year 2 (2018-19 School Year) Clusters

Similar to our analysis of Research Question 2a, in Grant Year 2, the discriminant analysis determined that the model would best fit using five distinct clusters (k=5). We then repeated the cluster analysis to identify the average duration that learning facilitators engaged in professional learning per cluster. Figure 18 compares the average duration for each cluster in hours and ranks them from High to Low, and then Figure 19 presents the cluster sizes, breakdown by content level, average dose in hours, and total number of hours completed.

The average duration was substantially higher in Grant Year 2 for three reasons:

- We considered dose to be cumulative from Grant Year 1 to Grant Year 2.
- As previously discussed, the learning facilitators had access to a wider variety of professional learning opportunities during the second year.
- More learning facilitators engaged in Masters' Courses which required the most amount of time to complete.

Figure 20: Illustration of Average Dose per Cluster for Grant Year 2

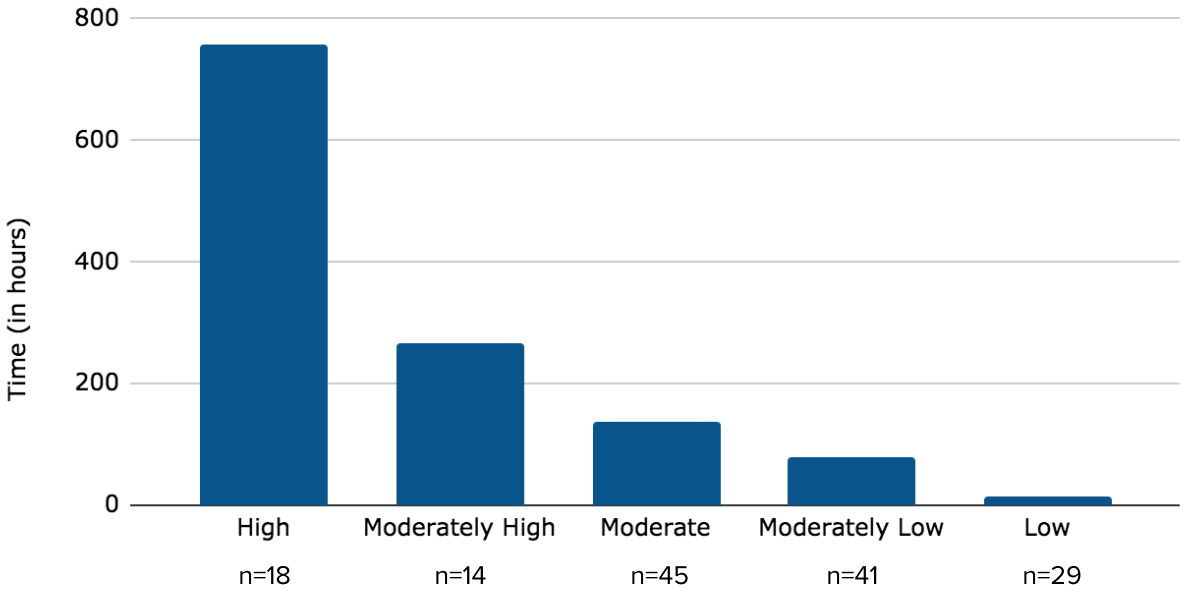


Figure 21: Cluster Composition by Content Level and Dose

	K-2 # (%)	3-5 # (%)	6-8 # (%)	9-12 # (%)	Mean Duration (SD)	Total Hours Completed
High (*n* = 18)	1 (5.6%)	6 (33.3%)	5 (27.8%)	6 (33.3%)	757.6 (158.9)	13,673.3
Moderately High (*n* = 14)	2 (14.3%)	5 (35.7%)	3 (21.4%)	4 (28.6%)	267.4 (78.9)	3,743.6
Moderate (n=45)	20 (44.4%)	12 (26.7%)	10 (22.2%	3 (6.7%)	136.8 (24.0)	6,157.9
Moderately Low (*n* = 41)	17 (41.5%)	7 (17.1%)	6 (14.6%)	11 (26.8%)	78.3 (16.4)	3,211.8
Low (*n* =29)	4 (13.8%)	5 (17.2%)	8 (27.6%)	12 (41.4%)	13.4 (14.2)	387.2

Research Question #2 Conclusions

Whereas the first research question examined the impact of the distinct PLO types on learner growth, the second addressed the question **which clusters of professional learning opportunities emerged in terms of the combinations of professional learning and also in terms of duration (measured in hours)?** Using exploratory cluster analysis, we identified distinct combinations of professional learning by type as well as by dose.

Given the differences between the available professional learning opportunities offered during Grant Years 1 and 2, each year was analyzed separately, and distinct combinations emerged. The identified clusters will be used to analyze learner growth data to answer the final research question.

RQ3: Which combinations of professional learning – both in terms of type and duration – had the greatest effect on learner achievement as measured by the various learner assessments, and which combinations had the greatest effect within the English Learner population?

This final research question culminates the broader inquiry into the potential impact of the TSL grant-funded professional learning opportunities on learner growth. Whereas the first research question examined the effects of each type of PLO as a discrete variable, and the second used cluster analysis to identify combinations of professional learning, this third analysis uses the combinations as independent variables to examine their effect on learner growth.

To answer this third research question, we used a combination of the formative Developmental Reading Assessment (DRA) and Scholastic Reading Inventory (SRI) assessments as well as the summative Smarter Balanced Assessment Corporation (SBAC) assessment. Because both the DRA and SRI presented multiple measurements per year, we took advantage of the longitudinal nature of the data by conducting latent growth curve analyses. First, we plotted the observed scores from each measurement occasion to examine how learners' scores changed over time. Next, we built statistical models of growth (i.e., latent growth models) using the learner data, which allowed us to both examine baseline achievement (i.e., intercepts) as well as growth over time (i.e., slopes) and to test the extent to which clusters from the previous research question predicted learner growth. In addition to the aforementioned models, we provide descriptive statistics to summarize the results across the sample for each of the clusters.

After completing the growth models, we used predictive models to examine the effects of the different clusters on the summative ELA and math data from the SBAC. Because LUSD also wanted to specifically examine the critical sample of English Learners, we repeated both the growth models and the predictive analysis on the sub-set of learners who had completed the English Language Proficiency Assessments for California (ELPAC). Additionally, we examined the effects of the different clusters on English Learner ELPAC performance.

RQ3a - Part 1: The Effects of Different Combinations of PLO Types on Learner Growth

As with the previous research questions, we examine the data from Grant Year 1 (2017-18 School Year) and Grant Year 2 (2018-19 School Year) separately. In each section below, we first present the latent growth models to examine the effects of the different clusters of PLO types on learners' reading growth. Then, we use those same clusters with the summative SBAC data to examine how assignment to the cluster might predict learners' achievement in ELA and math.

Analysis of DRA and SRI Scores

Because learners take the DRA and SRI at multiple times during the school year, we could use that formative data to examine the effects of the professional learning clusters over time using latent growth models. To determine the quality of the model fit (or goodness of fit), we used a chi-square test as well as alternative fit indices such as Tucker-Lewis Index, comparative fit index, root mean squared error of approximation, and standardized root mean square residual to test how the model predicts the learners' performance. For the models created using the DRA (for content levels K-2) and SRI (for content levels 3-5, 6-8, and 9-12), we determined an acceptable quality of fit.

Chi-square = 937.499, df = 21; CFI = .98; TLI = .97; RMSEA = .15; SRMR .04

First, we constructed separate latent growth models for each grant year using the DRA data for learners in K-2. These models, illustrated by the figures, indicate that each cluster had a different starting point (y-intercept) as well as a different rate of growth. The tables then present the mean scores, by cluster, at each time period as well as a change score from between the first and last time period of data collection and an effect size.

Key Consideration: *Within these models,* ***effect size serves as an indication of the magnitude of the trajectory of the growth****. Clusters with a larger effect size have a larger predicted amount of growth.*

As illustrated by the figures below, growth was not linear across the clusters. Dips in scores could be observed. Therefore, though the change scores provided in the tables serve as an indication of slope based on an assumed linear relationship between the first and third time points, the effect sizes serve as a better indication of the magnitude of the trajectory and thus a more accurate predictor of the effects of cluster assignment on learners' growth. We can then make the following observations from the data:

- Because Cluster 1b did not include any K-2 learning facilitators, it was excluded from the Year 1 model.
- During Grant Year 1, Cluster 1d had a higher change score, but Cluster 1c had a stronger effect size.
- Cluster 2e in Grant Year 2 had a higher change score, though Cluster 2c possessed a greater magnitude of effect.

Figure 22: Latent Growth Model Using DRA Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year)

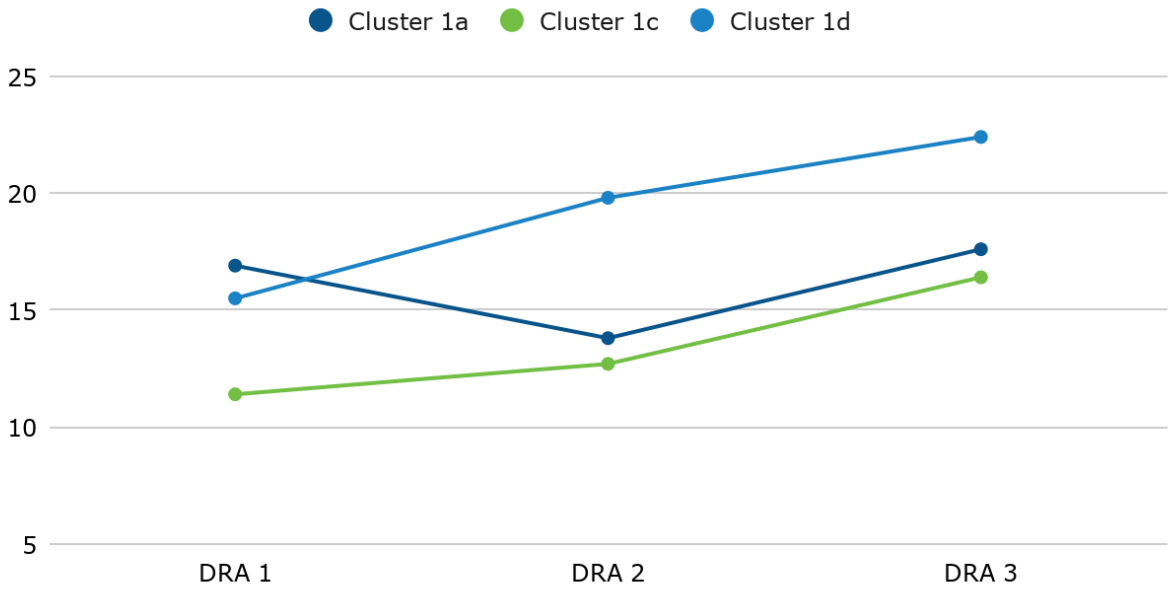


Figure 23: Latent Growth Model Using DRA Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year)

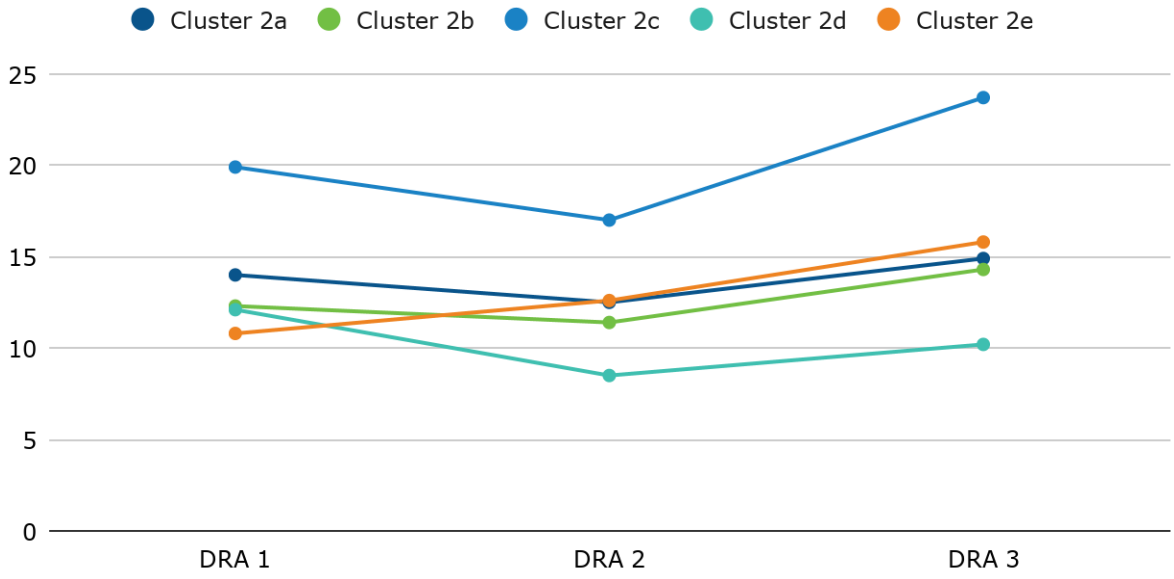


Table 14: DRA Statistics for Clusters Based on PLO Type for Grant Year 1

	DRA 1	DRA 2	DRA 3	Change Score	Effect Size
Cluster 1a	16.9	13.8	17.6	0.7	-0.111
Cluster 1b	-	-	-	-	-
Cluster 1c	11.4	12.7	16.4	5	0.085
Cluster 1d	15.5	19.8	22.4	6.9	0.045

Table 15: DRA Statistics for the Clusters Defined by PLO Type for Grant Year 2

	DRA 1	DRA 2	DRA 3	Change Score	Effect Size
Cluster 2a	14	12.5	14.9	0.9	-0.102
Cluster 2b	12.3	11.4	14.3	2	-0.006
Cluster 2c	19.9	17	23.7	3.8	0.235
Cluster 2d	12.1	8.5	10.2	-1.9	-0.185
Cluster 2e	10.8	12.6	15.8	5	0.107

Key observations regarding Grant Year 1: Interestingly, during Grant Year 1, Cluster 1a appears to have had the least effect on student growth, and yet it consisted of the most number of K-2 learning facilitators (n=22) who all participated in at least one PLO type. On the contrary, Cluster 1d demonstrated a greater change score with the smallest sample of learning facilitators. This cluster consisted of learning facilitators who engaged in more depth of professional learning either through Micro Credentials or Master's Courses. Finally, K-2 learning facilitators represented 34.8% of Cluster 1c, which was the largest overall cluster (n=46) in Grant Year 1. This cluster completed more Focus Institutes and Learning Academies than the others, implying that the quantity of professional learning experiences could have contributed to the magnitude of the effect.

Key Take-Away

During Grant Year 1, learning facilitators in Cluster 1c completed more Focus Institutes and Learning Academies. Membership in this cluster had the greatest magnitude of effect on learners' DRA scores.

Key observations regarding Grant Year 2: During the second year, only Clusters 2c and 2e had a positive effect on learner growth. Because Cluster 2c only included two learning facilitators at the K-2 content level, its effect needs to be more closely examined in other contexts. On the other hand, over 50% of Cluster 2e consisted of K-2 learning facilitators (n=16). As a cluster, they completed the most number of distinct professional learning opportunities with the majority participating in either multiple Focus Institutes or multiple Site-based Learning Academies.

Key Take-Away

Clusters in which K-2 learning facilitators engaged in multiple types of PLOs (Cluster 1c and 2e) appeared to have a greater magnitude of effect on learner reading growth.

We then applied the same models to the SRI scores. Like the DRA, the SRI presented multiple data points from which to construct models of learner growth. Because the SRI is a scaled score, we constructed the models by content level ranges (3-5, 6-8, 9-12). As explained in the introduction to this report, expected annual growth in SRI reading scores is higher in elementary than middle or upper content levels[20]. Therefore, we did not expect to see as much of an effect at the higher content levels.

To be able to make comparisons across the clusters and within the content levels, we first constructed figures illustrating the growth trajectories for each cluster by content level and by grant year. Then, we constructed two tables - one for each grant year - to specifically examine the change scores and effect sizes across content levels and clusters. Analysis of these figures and tables then allowed us to make several observations:

- During Grant Year 2, learning facilitators in content levels 9-12 only fell into two of the clusters; therefore, there is only data for Cluster 2b and 2c.
- As with the DRA data, the SRI models illustrate that learner growth did not always have a linear trajectory so it will be necessary to compare both the change scores and the effect sizes.
- Compared to the DRA scores, across all content levels, cluster assignment appeared to have less of an effect when predicting learners' reading growth on the SRI.
- As expected, the lower content levels experienced greater growth.

[20] Scholastic Inc. (2007). *SRI technical guide.* https://www.hmhco.com/product-support/content/techsupport/sri/manuals/SRI_Tech_Guide_05_10.pdf National Center for Education Statistics [NCES]. (2015). *The condition of education: Reading and mathematics score trends.* https://nces.ed.gov/programs/coe/indicator_cnj.asp

Figure 24: Latent Growth Model Using SRI Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year) for Content Levels 3-5

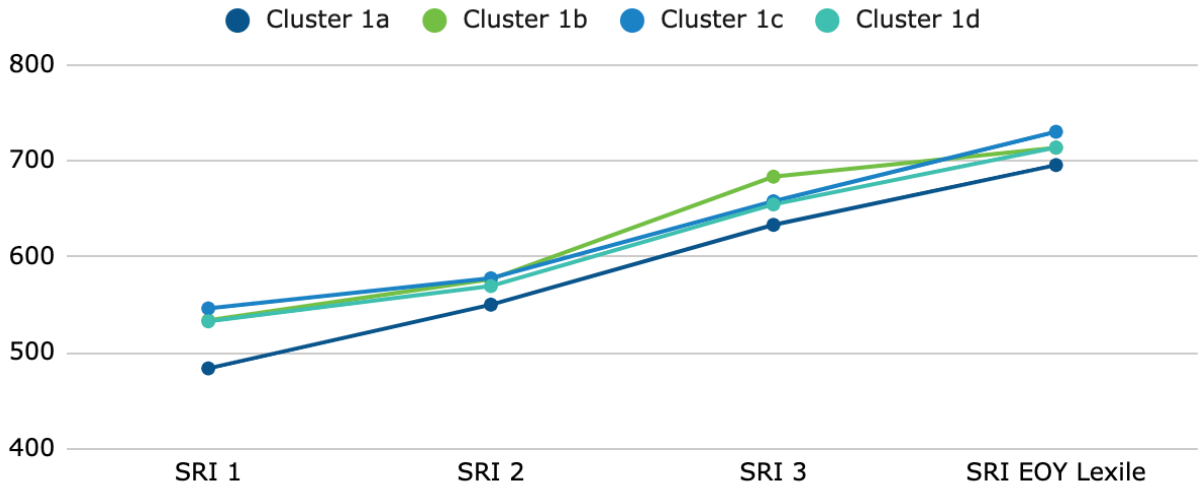


Figure 25: Latent Growth Model Using SRI Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year) for Content Levels 6-8

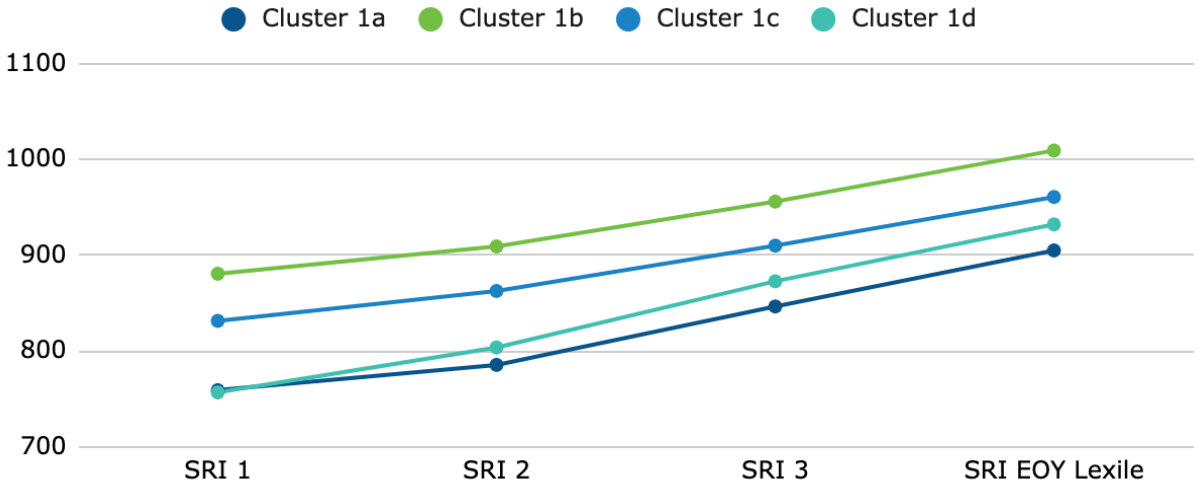


Figure 26: Latent Growth Model Using SRI Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year) for Content Levels 9-12

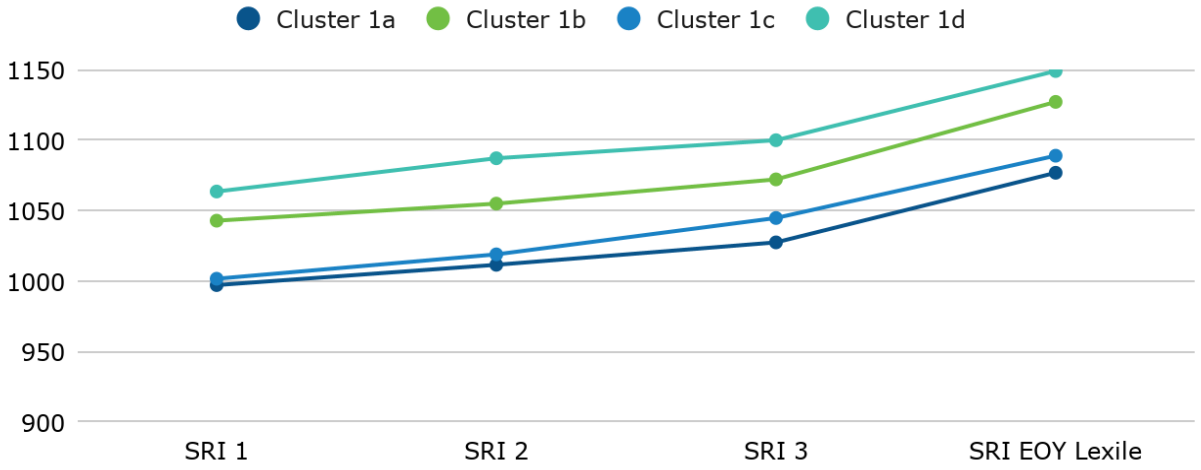


Figure 27: Latent Growth Model Using SRI Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year) for Content Levels 3-5

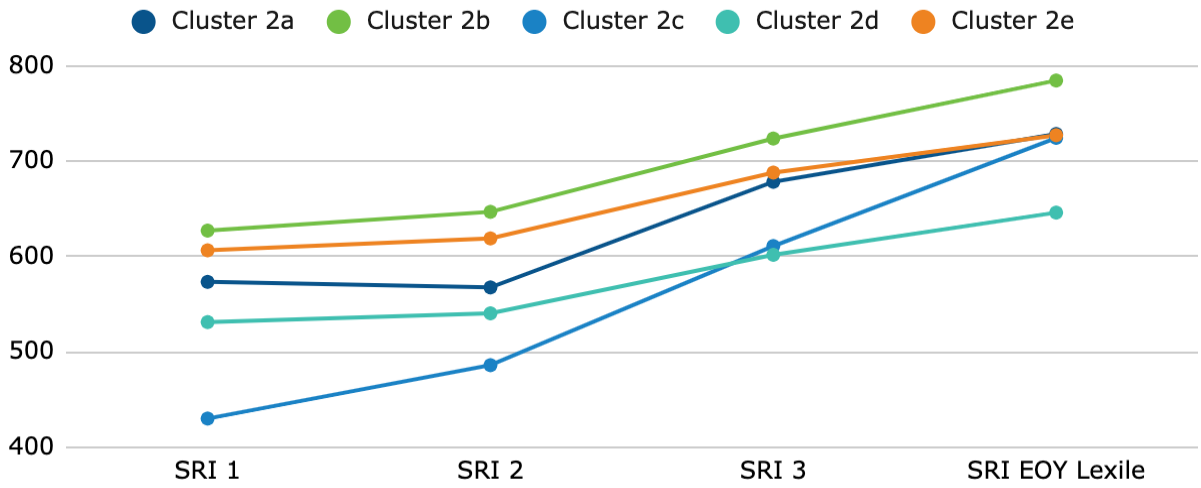


Figure 28: Latent Growth Model Using SRI Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year) for Content Levels 6-8

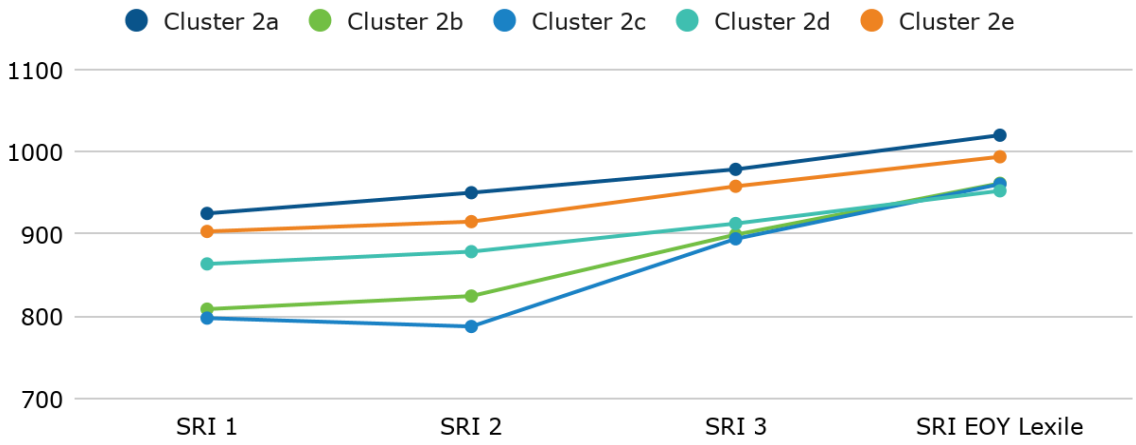


Figure 29: Latent Growth Model Using SRI Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year) for Content Levels 9-12

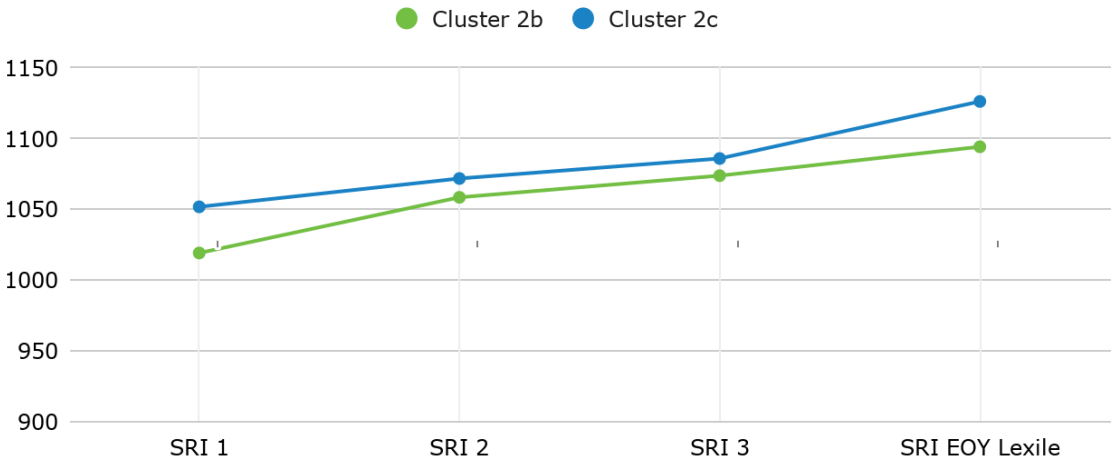


Table 16: Comparison of SRI Change Scores and Effect Sizes for Clusters Based on PLO Type for Grant Year 1 (2017-18 School Year)

	Content Levels 3-5		Content Levels 6-8		Content Levels 9-12	
	Change Score	Effect Size	Change Score	Effect Size	Change Score	Effect Size
Cluster 1a	211.9	0.052	145.9	0.009	79.7	-0.009
Cluster 1b	179.97	-0.036	128.6	-0.096	84.3	0.002
Cluster 1c	184.1	-0.014	129.3	-0.088	87.3	0.014
Cluster 1d	181.2	-0.019	175.4	0.155	85.5	-0.006

Table 17: Comparison of SRI Change Scores and Effect Sizes for Clusters Based on PLO Type for Grant Year 2 (2018-19 School Year)

	Content Levels 3-5		Content Levels 6-8		Content Levels 9-12	
	Change Score	Effect Size	Change Score	Effect Size	Change Score	Effect Size
Cluster 2a	155.2	-0.01	95.1	-0.011	-	-
Cluster 2b	157.5	0.051	153	0.155	75	0.052
Cluster 2c	294.5	0.376	162.9	0.209	74.4	-0.062
Cluster 2d	114.9	-0.154	88.9	-0.163	-	-
Cluster 2e	120.8	-0.172	90.8	-0.139	-	-

Key observations regarding Grant Year 1: Cluster assignment did not affect the scores equally across content levels. In Grant Year 1, only Cluster 1a had a positive magnitude of effect for content levels 3-5 and 6-8. When looking at the composition of the cluster, 15 of the 44 (34.1%) learning facilitators support learners in these content levels, and they completed primarily a combination of Focus Institutes and Learning Academies. Cluster 1d, which contained 12 learning facilitators from content levels 6-8 (27.3% of the cluster), also positively impacted the growth trajectory of the learners. These learning facilitators engaged in a combination of Micro Credentials and Master's Courses. At the 9-12 content level, a minimal effect can be attributed to participation in Clusters 1b and 1c. Both of those clusters included substantial participation in Focus Institutes and Learning Academies.

Key Take-Away

Cluster assignment had varying effects on learner growth depending on the content level.

Key observations regarding Grant Year 2: During Grant Year 2, a greater effect could be detected based on cluster assignment. Learning facilitators in content levels 3-5 and 6-8 who were assigned to Cluster 2c not only had the highest change scores but also the lowest starting points. However, this score needs to be examined critically. First, Cluster 2c had a relatively low participation rate, only 5 learning facilitators from 3-5 and 6 from 6-8. The majority of Cluster 2C consisted of 9-12 learning facilitators (n=27, 67.5%). However, 14 of 40 learning facilitators who were clustered into 2c did not complete any professional learning. Additional analyses will be required to better understand how and if engagement in this combination of professional

learning - predominantly a combination of Focus Institutes, Learning Academies, Micro Credentials, and Master's Courses - impacted learner growth.

Only assignment to Cluster 2b appeared to have any magnitude of effect on learner growth. Members of Cluster 2b completed an average of 6.27 Focus Institutes, 1.23 Learning Academies, and 1.23 Site-based Learning Academies in addition to a smaller number of Micro Credentials, Master's Courses, and TIE Courses. This observation could infer that participation in a number of PLO types influenced learner growth in reading.

Key Take-Away

When clusters included learning facilitators who engaged in a variety of different PLO types, particularly Focus Institutes and Learning Academies, learner growth could be predicted with a greater magnitude of effect.

Analysis of SBAC Prediction by Clusters

Educational data are often nested, such that learners are nested within learning facilitators and learning facilitators are nested within learning communities. To ensure that we ran the appropriate models, and to satisfy statistical assumptions (e.g., independence of observations), we tested a series of unconditional models at each content level (i.e., K-2, 3-5, 6-8, 11). Based on the magnitude of the intraclass correlation coefficient (ICC) at each content level, which determines how strongly the units in a group resemble each other, we deemed it most appropriate to conduct multilevel (or mixed effects) models using the SBAC data (both ELA and Math scores).

In other words, because there was a substantial percentage of variance accounted for by learning facilitators, we considered this in the model. It also should be noted that we statistically controlled for (or held constant) the effects of content level within the content ranges (i.e., 3-5 and 6-8). Because SBAC is only given to learners in content level 11 at the high school, we detected a higher ICC and did not have to make any additional adjustments.

The multilevel model then predicts the performance of learners on the SBAC based on assignment into each cluster. In the tables below, we provide a standardized beta coefficient as the effect size to indicate the direction and magnitude of this prediction. Our findings convey how the cluster predicts performance in ELA and math based on assignment into the different clusters. We examined the effects of each grant year separately and made the following observations:

- The effect sizes (beta) for all cluster assignments indicated that membership in a cluster had a relatively small impact on learner growth as measured by the SBAC.
- Comparatively, during Grant Year 1, Cluster 1b had more of an effect on predicting learner growth.
- Membership in Clusters 2a and 2C had the most effect on predicting learner growth in Grant Year 2.

Table 18: Predicted Performance Based on Effect Size (beta) in ELA Literacy Score and Math for Grant Year 1 (2017-18 School Year) for PLO Type Clusters

	Content Levels 3-5		Content Levels 6-8		Content Level 11	
	ELA ICC = .23	Math ICC =.25	ELA ICC = .22	Math ICC =.16	ELA ICC = .42	Math ICC =.33
Cluster 1a	-.048	-.045	.000	.007	.027	-.016
Cluster 1b	.110	.084	.177	.198	-.028	.000
Cluster 1c	.017	.000	-.104	-.137	-.032	.053
Cluster 1d	-.039	-.005	-.083	-.082	.014	-.027

Table 19: Predicted Performance Based on Effect Size (beta) in ELA Literacy Score and Math for Grant Year 2 (2018-19 School Year) for PLO Type Clusters

	Content Levels 3-5		Content Levels 6-8		Content Level 11	
	ELA ICC =.28	Math ICC =.24	ELA ICC =.23	Math ICC =.18	ELA ICC = .49	Math ICC =.39
Cluster 2a	.093	.036	.082	.086	-	-
Cluster 2b	.023	.032	-.043	-.045	-.157	-.150
Cluster 2c	.023	.083	.059	.105	.197	.181
Cluster 2d	-.015	-.044	-.066	-.108	-	-
Cluster 2e	-.094	-.065	-.014	-.004	-	-

Key observations regarding Grant Year 1: In looking more closely at the cluster assignments, it is critical to note that while Cluster 1b appeared to be a better predictor of SBAC performance in Grant Year 1, it also had the fewest number of learning facilitators (n=15) intimating that additional attributes about these learning facilitators such as years of teaching experience or additional certifications will need to be explored in future reports. However, learning facilitators in this cluster did complete 25 Focus Institutes, 3 Learning Academies, 12 Micro Credentials, and 7 Master's Courses, again implying that a combination of PLO types might be most beneficial.

Key observations regarding Grant Year 2: Members of Clusters 2a and 2c also completed a range of PLO types. In Cluster 2a, the learning facilitators collectively completed 246 Focus Institutes and 171 Site-based Learning Academies. Although the average number of professional learning opportunities in Cluster 2c appeared lower, this cluster (n=40) also included 14 learning facilitators who did not participate in any professional learning. This raises two questions, particularly since the cluster assignment appeared to be the best predictor of SBAC growth for learners in content level 11. First, what other factors could contribute to growth if almost 35% of the cluster did not complete any professional learning? Second, the 26 learning facilitators who did participate in the various PLOs collectively completed 34 Focus Institutes, 24 Learning Academies, 19 Micro Credentials, 6 Site-based Learning Academies, 38 Master's Courses, and 4 TIE courses - once again implying that both variety and quantity may be a factor.

Key Take-Away

Much like with the DRA and SRI, the magnitude of predicted performance was greater in clusters that included learning facilitators who engaged in a variety of different PLO types.

RQ3a - Part 2: The Effects of Duration (dose in hours) of Professional Learning on Learner Growth

To answer the second part of this research question, we repeated the analysis using the clusters based on dose. In each section below, we first present the latent growth models to examine the effects of the varying durations of professional learning on learners' reading growth. Then, we use those same clusters with the summative SBAC data to examine how they might predict learners' achievement in ELA and math.

Analysis of DRA and SRI Scores

We once again used the formative data from the DRA and SRI to examine the effects of duration on learner growth using latent growth models. Similar to how we analyzed the effects of cluster assignment by PLO type, in this section we examine the clusters defined in Research Question 2b to examine the effects of dose (i.e., duration of participation in hours) on learner reading growth.

After first examining the DRA by grant year as well as content level, we made the following observations based on the figures and tables below:

- The models illustrated learner growth between DRA 2 and DRA 3 for all clusters.
- Since there are only two data points for the High dose cluster in Grant Year 1 as well as the High and Moderately High clusters in Grant Year 2, it can be inferred it only included learners in K and not content levels 1 and 2. Since the DRA is a scaled score, it is then logical that these higher dose clusters had the lowest scores.
- It was not possible to calculate an effect size for the clusters with only two data points, so we could only descriptively examine the change scores.
- Once again, the latent growth models were not linear. When making comparisons, it is critical to look at both the change score and the magnitude of effect.

Figure 30: Latent Growth Model Using DRA Data for the Clusters Defined by Level of Duration in Grant Year 1 (2017-18 School Year)

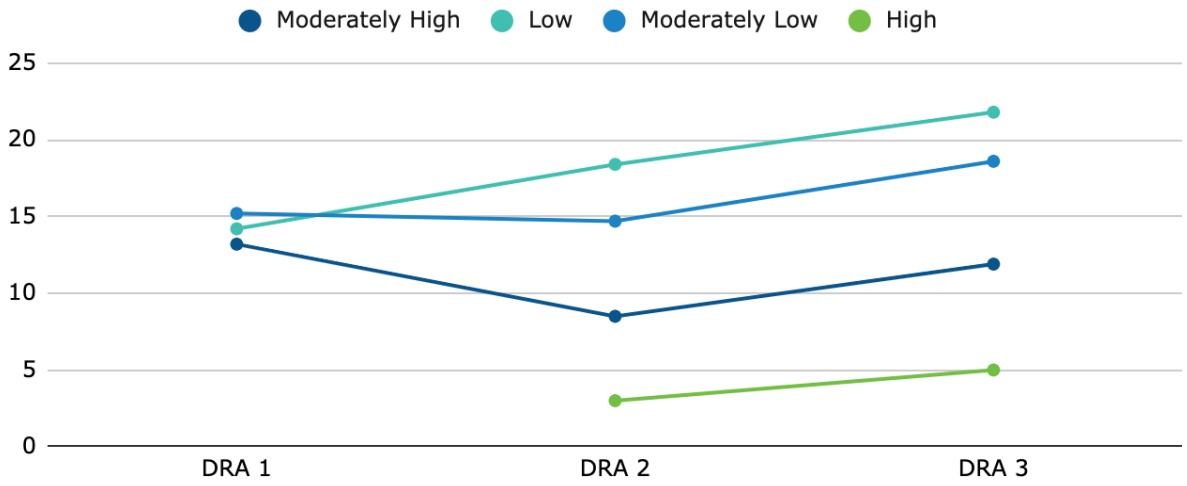


Figure 31: Latent Growth Model Using DRA Data for the Clusters Defined by Level of Duration in Grant Year 2 (2018-19 School Year)

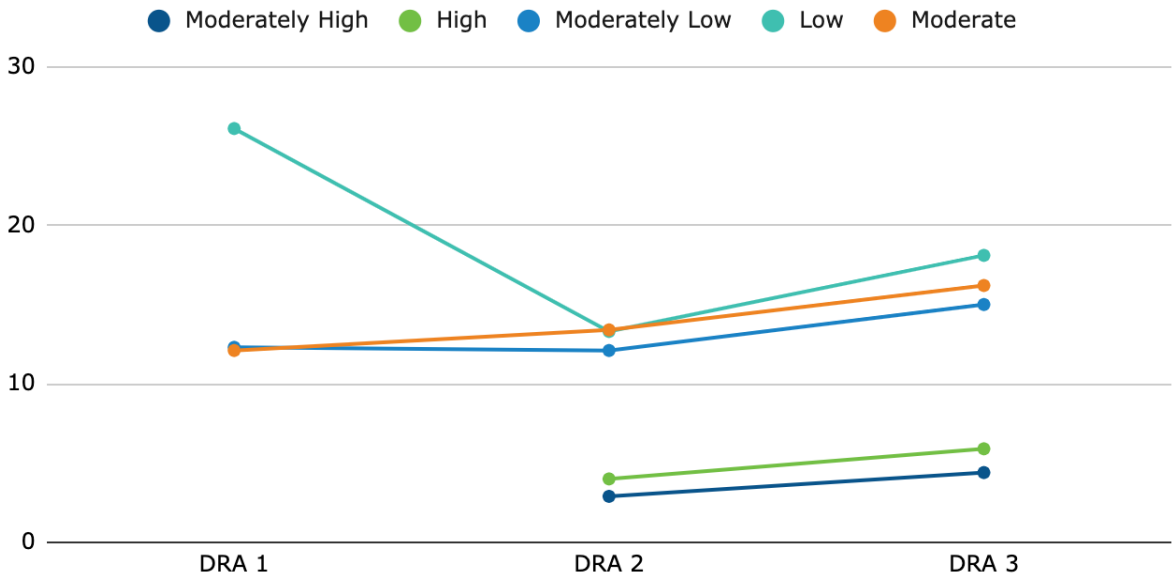


Table 20: DRA Statistics for Clusters Defined by Duration for Grant Year 1

	DRA 1	DRA 2	DRA 3	Change Score	Effect Size
Low	14.2	18.4	21.8	7.6	0.056
Moderately Low	15.2	14.7	18.6	3.4	0.072
Moderately High	13.2	8.5	11.9	-1.3	-0.091
High	-	3	5	2	-

Table 21: DRA Statistics for the Clusters Defined by Duration for Grant Year 2

	DRA 1	DRA 2	DRA 3	Change Score	Effect Size
Low	26.1	13.3	18.1	-8	0.147
Moderately Low	12.3	12.1	15	2.7	-0.034
Moderate	12.1	13.4	16.2	4.1	0.05
Moderately High	-	2.9	4.4	1.5	-
High	-	4	5.9	1.9	-

Key Consideration: *Before drawing conclusions about the effects of dose, it is critical to consider the compositions of the clusters by duration. During Grant Year 1, only one K-2 learning facilitator was detected in the High dose cluster. The majority could be characterized as either Low or Moderately Low. In Grant Year 2, only one learning facilitator from content level 1 was in the High cluster and two were in the Moderately High cluster. The majority of K-2 learning facilitators fell into the Moderate and Moderately Low clusters. Given these discrepancies in participation by cluster, it is difficult to draw conclusions from just the DRA data.*

With the SRI data, we first examined the latent growth models by grant year and content level range. Then, we compared the change scores by content level for cluster and each grant year.

- As discussed previously, learners in the elementary grades saw a greater change in scores.
- Given that the relationship continues to be non-linear, the change in scores and effect size need to be considered concurrently.
- Similar to the analysis of DRA scores, assignment to cluster by duration did not seem to have as great of an effect as assignment to cluster by PLO type.

Figure 32: Latent Growth Model Using SRI Data for the Clusters Defined by Level of Duration in Grant Year 1 (2017-18 School Year) for Content Levels 3-5

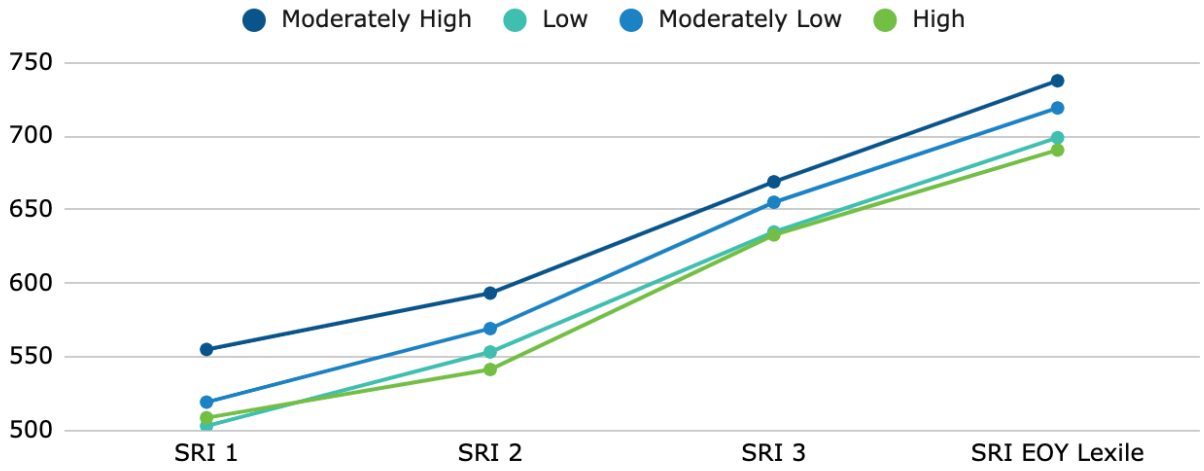


Figure 33: Latent Growth Model Using SRI Data for the Clusters Defined by Level of Duration in Grant Year 1 (2017-18 School Year) for Content Levels 6-8

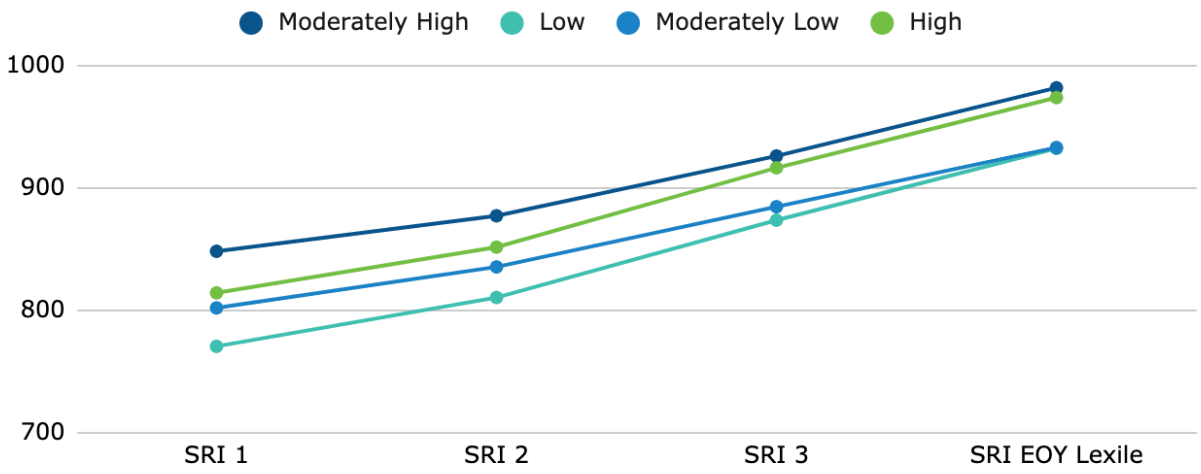


Figure 34: Latent Growth Model Using SRI Data for the Clusters Defined by Level of Duration in Grant Year 1 (2017-18 School Year) for Content Levels 9-12

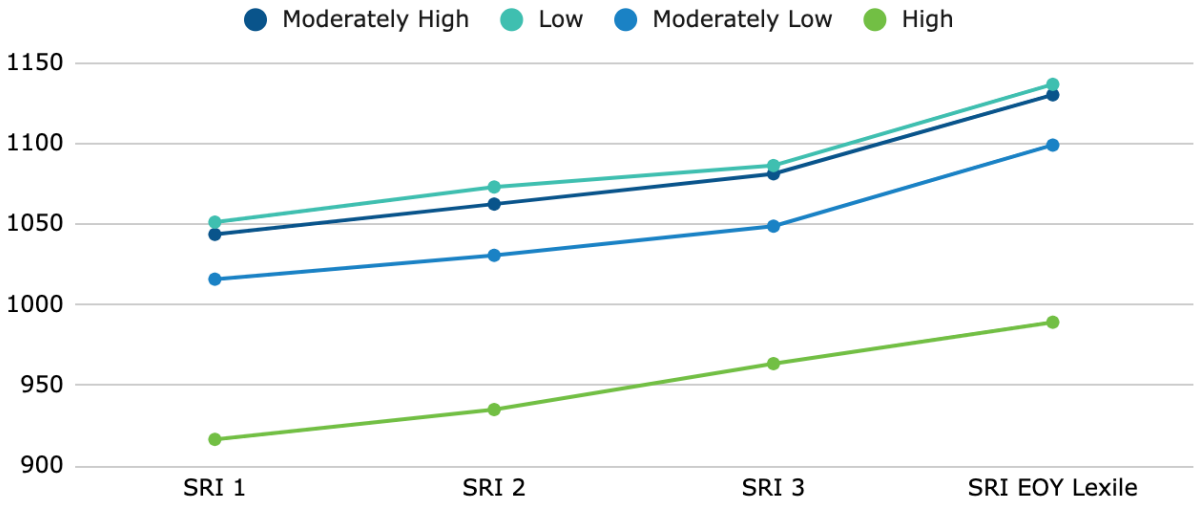


Figure 35: Latent Growth Model Using SRI Data for the Clusters Defined by Level of Duration in Grant Year 2 (2018-19 School Year) for Content Levels 3-5

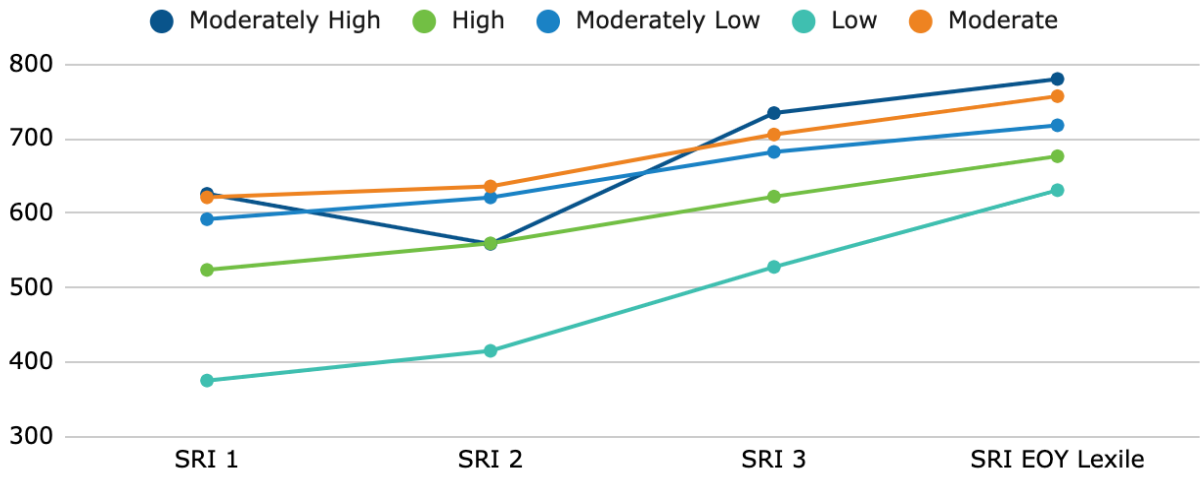


Figure 36: Latent Growth Model Using SRI Data for the Clusters Defined by Level of Duration in Grant Year 2 (2018-19 School Year) for Content Levels 6-8

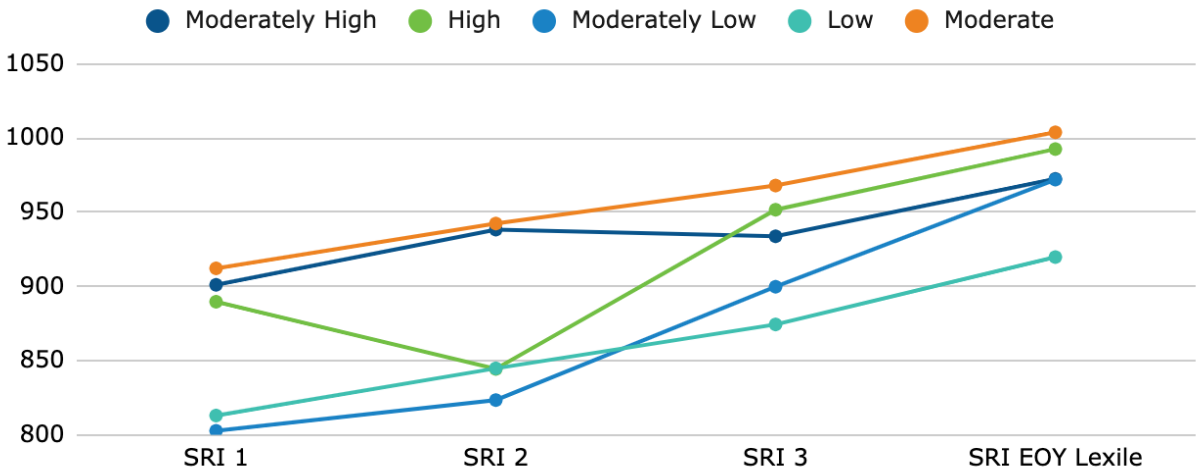


Figure 37: Latent Growth Model Using SRI Data for the Clusters Defined by Level of Duration in Grant Year 2 (2018-19 School Year) for Content Levels 9-12

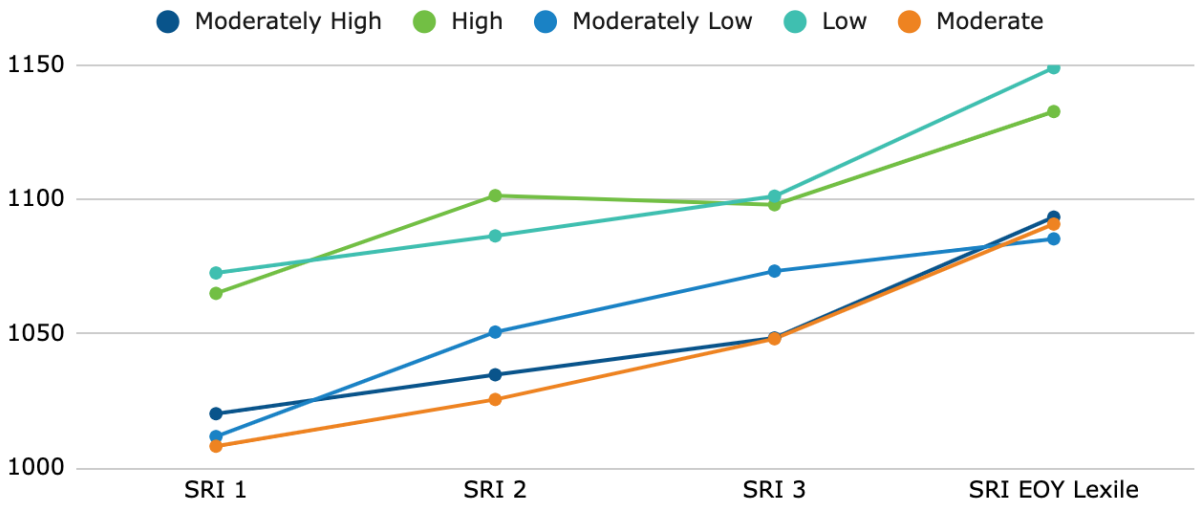


Table 22: Comparison of SRI Change Scores and Effect Sizes for Clusters Based on Duration for Grant Year 1 (2017-18 School Year)

	Content Levels 3-5		Content Levels 6-8		Content Levels 9-12	
	Change Score	Effect Size	Change Score	Effect Size	Change Score	Effect Size
Low	196	0.004	161.7	0.072	85.5	0.012
Moderately Low	200	0.004	131.1	-0.071	83.2	-0.004
Moderately High	182.7	-0.004	133.6	-0.065	86.6	-0.004
High	182	-0.012	159.6	0.052	72.7	-0.009

Table 23: Comparison of SRI Change Scores and Effect Sizes for Clusters Based on Duration for Grant Year 2 (2018-19 School Year)

	Content Levels 3-5		Content Levels 6-8		Content Levels 9-12	
	Change Score	Effect Size	Change Score	Effect Size	Change Score	Effect Size
Low	255.7	0.307	106.8	-0.027	76.4	-0.007
Moderately Low	126.2	-0.095	169.3	0.297	73.6	0.01
Moderate	135.9	-0.082	91.7	-0.132	82.7	0.069
Moderately High	154.2	0.001	71.4	-0.106	73.2	-0.005
High	152.7	-0.025	102.9	-0.054	67.7	-0.061

Key Take-Away

In Grant Year 1, the Low dose group seemed to have the greatest magnitude of effect across all content levels, and yet it also had the largest sample size. The effects varied across content levels during Grant Year 2. With content levels 3-5 and 9-12, the groups that appeared to have the greatest effect also had the fewest number of learning facilitators. Therefore, it is difficult to draw conclusions based solely on the relationship between dose and SRI data.

Analysis of SBAC Prediction by Clusters

Although dose did not appear to have an effect on learners' reading growth, we continued the analysis to determine whether assignment to clusters by duration might impact learner performance in ELA and math based on summative data from the SBAC. Since educational data are nested, such that learners are nested within learning facilitators and learning facilitators are nested within learning communities, we repeated the multilevel (or mixed effects) models to examine how dose might predict performance.

We examined the effects of each grant year and content level range separately and made the following observations after examination of the effect size (beta) for each set of scores:

- During Grant Year 1, assignment to either the Moderately High or High clusters served as an effective predictor of SBAC performance with only two exceptions: ELA performance for content levels 3-5 and 11.
- In Grant Year 2, none of the duration clusters predicted performance consistently across content levels.
- Across both years, the effect size (beta) of assignment to the High dose cluster served as a strong indicator of SBAC performance in ELA and math for content levels 6-8. Five learning facilitators were assigned to this cluster each year.

Table 24: Predicted Performance Based on Effect Size (beta) in ELA Literacy Score and Math for Grant Year 1 (2017-18 School Year) by Duration

	Content Levels 3-5		Content Levels 6-8		Content Level 11	
	ELA ICC = .23	Math ICC =.25	ELA ICC = .22	Math ICC =.16	ELA ICC = .42	Math ICC =.33
Low	.063	.054	-.106	-.092	-.020	-.091
Moderately Low	-.073	-.073	-.073	-.064	-.017	-.020
Moderately High	-.036	.005	.076	.040	.039	.119
High	.065	.027	.136	.150	-.005	.003

Table 25: Predicted Performance Based on Effect Size (beta) in ELA Literacy Score and Math for Grant Year 2 (2018-19 School Year) by Duration

	Content Levels 3-5		Content Levels 6-8		Content Level 11	
	ELA ICC =.28	Math ICC =.24	ELA ICC =.23	Math ICC =.18	ELA ICC =.49	Math ICC =.39
Low	-.051	-.066	-.140	-.162	.087	.110
Moderately Low	.015	.035	-.006	-.007	.027	.039
Moderate	-.004	.005	.053	.051	-.262	-.259
Moderately High	.069	.056	-.004	.015	.009	-.042
High	-.029	-.042	.107	.120	.039	.018

To understand the effects of assignment to cluster by duration requires additional analysis of the cluster compositions. First, substantially fewer learning facilitators were assigned to the High and Moderately High clusters. We infer that this also aligns with the durations of the different PLO types. Given that Master's Courses, TIE Courses, and Micro Credentials required a longer time commitment, fewer learning facilitators participated. Second, when looking at the mean duration for each cluster, it becomes apparent that with the exception of the Low clusters, learning facilitators received at least a minimum dose of professional learning.

Key Take-Away

The literature cited earlier in this report indicated that teachers who received at least 14 hours of professional learning could see a positive effect on student outcomes. Since the majority of learning facilitators received far more than this amount, the amount of time may not serve as a distinguishing factor. As such, examination by PLO Type appears to be more beneficial than by duration.

RQ3b: The Effects of Different Combinations of Professional Learning on English Learner Growth

As part of the TSL grant-funded professional learning initiative, LUSD wanted to pay particular attention to English Learner growth. To examine the effects of the different combinations of professional learning on this critical population, we first analyzed the results of the English Language Proficiency Assessments for California (ELPAC). We then used the sample of students who completed that assessment during the two grant years and repeated the analyses on

English Learners' reading growth and SBAC performance. Given our findings of the analysis by duration in the previous section, we did not repeat that process with the English Learners. Instead, we examined the effects of the various clusters based on combinations of PLO types.

The Effects of Professional Learning on English Learners' Language Proficiency

Because the ELPAC is a single, summative assessment, we completed a similar analysis as with the SBAC data. Based on the magnitude of the intraclass correlation coefficient (ICC) at each content level, we constructed multilevel models for the ELPAC using the Overall, Written, and Oral scores. This allowed us to once again account for the variance by learning facilitator and to statistically control for content level. The multilevel model then predicts the performance of learners on the ELPAC based on their assignment into each cluster. We use the standardized beta coefficient to indicate the direction and magnitude of this prediction.

When looking at the three sets of scale scores (Overall, Oral, and Written) for each content level and each grant year, we could make several observations.

- During Grant Year 1, assignment to Cluster 1b served as a positive predictor of growth on all three scales of the ELPAC for learners in content levels 3-5, 6-8, and 9-12.
- For K-2 learning facilitators, assignment to Clusters 1a and 1c served as a positive predictor of growth on all three ELPAC scales.
- In Grant Year 2, assignment to Cluster 2a was a positive predictor of growth on all three ELPAC scales for learners in K-2, 3-5, and 6-8.
- For learning facilitators in content levels 9-12, assignment to Cluster 2c positively indicated growth on all three ELPAC scales.

Table 26: Predicted ELPAC Performance (Overall Score) Based on Effect Size (beta) for Grant Year 1 (2017-18 School Year)

	K-2 (ICC = .31)	3-5 (ICC =.19)	6-8 (ICC = .10)	9-12 (ICC = .07)
Cluster 1a	.006	-.036	-.037	-.094
Cluster 1b	NA	.216	.066	.042
Cluster 1c	.035	-.084	-.018	.017
Cluster 1d	-.058	-.030	-.013	.032

** Data was not collected for learners in content level 12 in the first year*

Table 27: Predicted ELPAC Performance (Oral Score) Based on Effect Size (beta) for Grant Year 1 (2017-18 School Year)

	K-2 (ICC = .26)	3-5 (ICC =.12)	6-8 (ICC = .09)	9-12 (ICC = .04)
Cluster 1a	.011	-.018	-.042	-.058
Cluster 1b	NA	.142	.069	.018
Cluster 1c	.017	-.044	-.023	.004
Cluster 1d	-.040	-.040	-.008	.030

** Data was not collected for learners in content level 12 in the first year*

Table 28: Predicted ELPAC Performance (Written Score) Based on Effect Size (beta) for Grant Year 1 (2017-18 School Year)

	K-2 (ICC = .20)	3-5 (ICC =.19)	6-8 (ICC = .11)	9-12 (ICC = .05)
Cluster 1a	.013	-.050	-.019	-.119
Cluster 1b	NA	.260	.045	.063
Cluster 1c	.028	-.119	-.006	.030
Cluster 1d	-.058	-.005	-.018	.026

** Data was not collected for learners in content level 12 in the first year*

Table 29: Predicted ELPAC Performance (Overall Score) Based on Effect Size (beta) for Grant Year 2 (2018-19 School Year)

	K-2 (ICC = .33)	3-5 (ICC =.22)	6-8 (ICC = .23)	9-12 (ICC = .08)
Cluster 2a	.079	.091	.067	NA
Cluster 2b	.022	.018	-.085	-.017
Cluster 2c	-.011	-.101	-.055	.036
Cluster 2d	-.080	.034	.030	NA
Cluster 2e	-.039	-.055	.031	NA

Table 30: Predicted ELPAC Performance (Oral Score) Based on Effect Size (beta) for Grant Year 2 (2018-19 School Year)

	K-2 (ICC = .26)	3-5 (ICC =.16)	6-8 (ICC = .17)	9-12 (ICC = .05)
Cluster 2a	.039	.094	.041	NA
Cluster 2b	.052	.030	-.102	-.003
Cluster 2c	-.001	-.114	-.052	.012
Cluster 2d	-.037	.035	.072	NA
Cluster 2e	-.057	-.060	.016	NA

Table 31: Predicted ELPAC Performance (Written Score) Based on Effect Size (beta) for Grant Year 2 (2018-19 School Year)

	K-2 (ICC = .32)	3-5 (ICC =.24)	6-8 (ICC = .27)	9-12 (ICC = .13)
Cluster 2a	.096	.066	.097	NA
Cluster 2b	-.006	-.004	-.038	-.038
Cluster 2c	-.029	-.059	-.050	.072
Cluster 2d	-.110	.025	-.047	NA
Cluster 2e	-.005	-.035	.049	NA

When looking at the effects of cluster assignment based on PLO type, it is important to remember the characteristics of the clusters before drawing any conclusions. First, Cluster 1b appeared to be the best predictor of growth for English Language learners in Grant Year 1. Though it had the fewest learning facilitators (n=15), Cluster 1b collectively completed 25 Focus Institutes, 3 Learning Academies, 12 Micro Credentials, and 7 Master's Courses, implying that the learning facilitators experienced both a range and depth of opportunity. Similarly, the K-2 learning facilitators in Clusters 1a and 1C also engaged in a range of different PLO types. Of note, Cluster 1a included the most amount of Learning Academies and Cluster 1c the most Focus Institutes.

In Grant Year 2, a similar pattern emerged with the K-8 learning facilitators. Their assignment to Cluster 2a had the greatest magnitude of effect when predicting learner performance on all three scales of the ELPAC. Members of the cluster (n=26) completed a total of 483 different PLOs including 246 Focus Institutes and 171 Site-based Learning Academies.

Key Take-Away

Assignment to clusters that included both breadth and depth of professional learning opportunity served as a positive predictor of English Learner growth on the ELPAC for all three sets of scale scores: *Overall*, *Oral*, and *Written*.

The Effects of PLO Type on English Learners' Reading Growth

Following the same analysis procedure as with the entire population of LUSD learners, we next analyzed the DRA and SRI data for the English Learner population. First, we constructed separate latent growth models for each grant year and content level range. As Illustrated by the figures, each cluster had a different starting point (y-intercept) as well as a different rate of growth. For the DRA, the tables present the mean scores, by cluster, at each time period as well as a change score from between the first and last time period of data collection and an effect size. With the SRI, we repeated the comparison of change scores and effect sizes by content level and grant year for each cluster.

From our analysis of the DRA data, we could make similar observations using the English Language data as the general LUSD data:

- As with the earlier analysis, in Grant Year 1, Cluster 1d had a higher change score, but Cluster 1c had a stronger effect size.
- Although assignment to Cluster 1a served as a stronger predictor of ELPAC growth, it did not have the same effect on learner growth.
- Unlike the earlier analysis, in Grant Year 2, Cluster 2c had both a higher change score and a greater magnitude of effect on learner reading growth, and yet assignment to this cluster did not predict ELPAC growth. This could be due to the small number of learning facilitators assigned to the cluster (n=2).

Figure 38: Latent Growth Model Using English Learner DRA Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year)

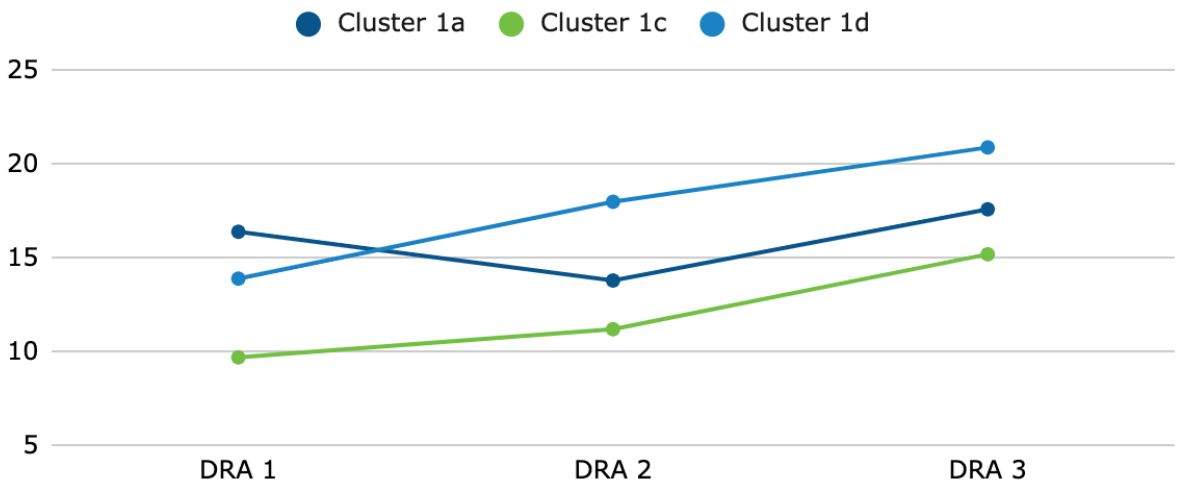


Figure 39: Latent Growth Model Using English Learner DRA Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year)

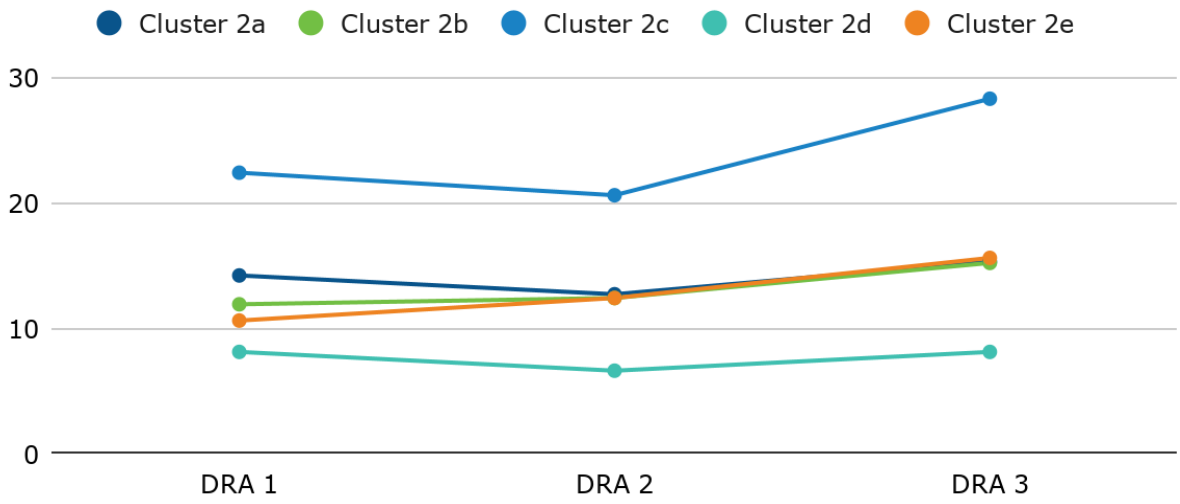


Table 32: English Learner DRA Statistics for Clusters Based on PLO Type for Grant Year 1

	DRA 1	DRA 2	DRA 3	Change Score	Effect Size
Cluster 1a	16.4	13.8	17.6	1.2	-0.141
Cluster 1b	-	-	-	-	-
Cluster 1c	9.7	11.2	15.2	5.5	0.104
Cluster 1d	13.9	18	20.9	7	0.076

Table 33: English Learner DRA Statistics for the Clusters Defined by PLO Type for Grant Year 2

	DRA 1	DRA 2	DRA 3	Change Score	Effect Size
Cluster 2a	14.2	12.7	15.3	1.1	-0.08
Cluster 2b	11.9	12.4	15.2	3.3	0.004
Cluster 2c	22.4	20.6	28.3	5.9	0.263
Cluster 2d	8.1	6.6	8.1	0	-0.172
Cluster 2e	10.6	12.4	15.6	5	0.047

We applied the same models to the SRI scores for the English Learner population. However, because the SRI is a scaled score, we constructed the models by content level ranges (3-5, 6-8, 9-12) for each grant year. To make comparisons across the clusters and within the content levels, we built models illustrating the growth trajectories for each cluster by content level and grant year. Then, we constructed two tables - one for each grant year - to examine the change scores and effect sizes across content levels and clusters.

Analysis of these figures and tables allowed us to make several observations:

- As with the ELPAC data, Cluster 1a had a positive magnitude of effect on learner growth for content levels 3-8 during Grant Year 1. A similar finding emerged when looking at the entire LUSD learner population.
- In Grant Year 2, Clusters 2b and 2c also had a positive magnitude of effect for learners in content levels 3-8. This finding also mirrors that from analysis of the broader learner population.
- For content levels 9-12, Clusters 1c and 2b indicated a positive effect. Learning facilitators in these clusters completed a large number of Focus Institutes and a moderate amount of Learning Academies.

Figure 40: Latent Growth Model for 3-5 English Learners Using SRI Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year)

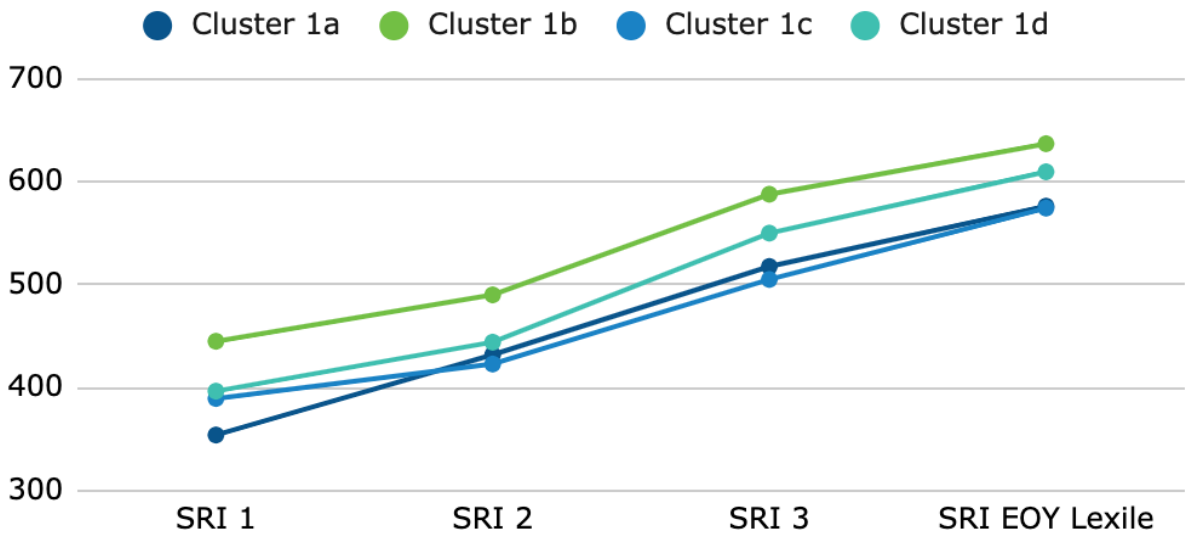


Figure 41: Latent Growth Model for 6-8 English Learners Using SRI Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year)

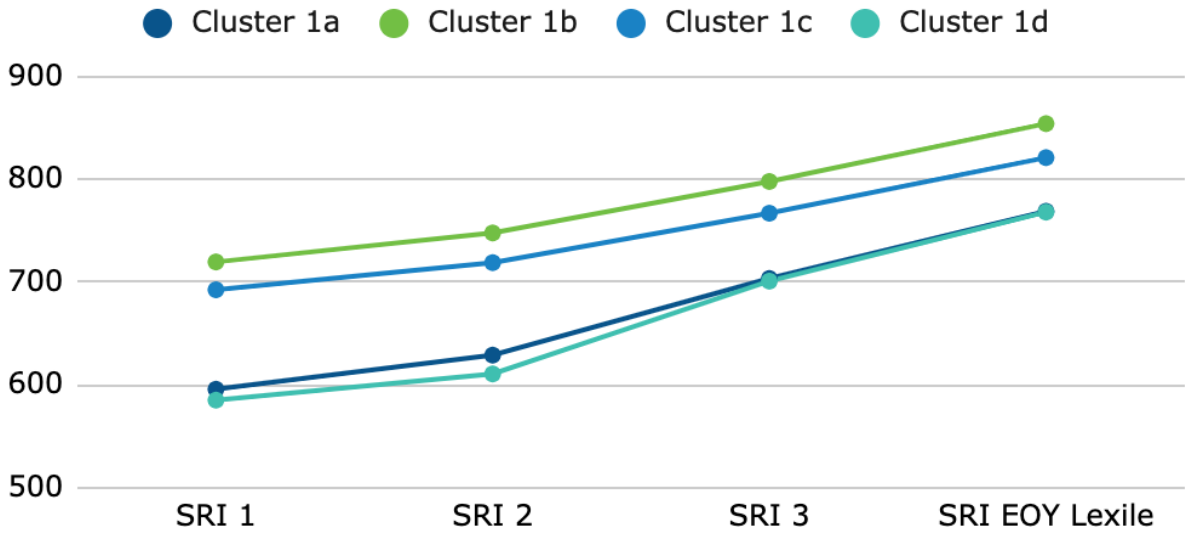


Figure 42: Latent Growth Model for 9-12 English Learners Using SRI Data for the Clusters Defined by PLO Type during Grant Year 1 (2017-18 School Year)

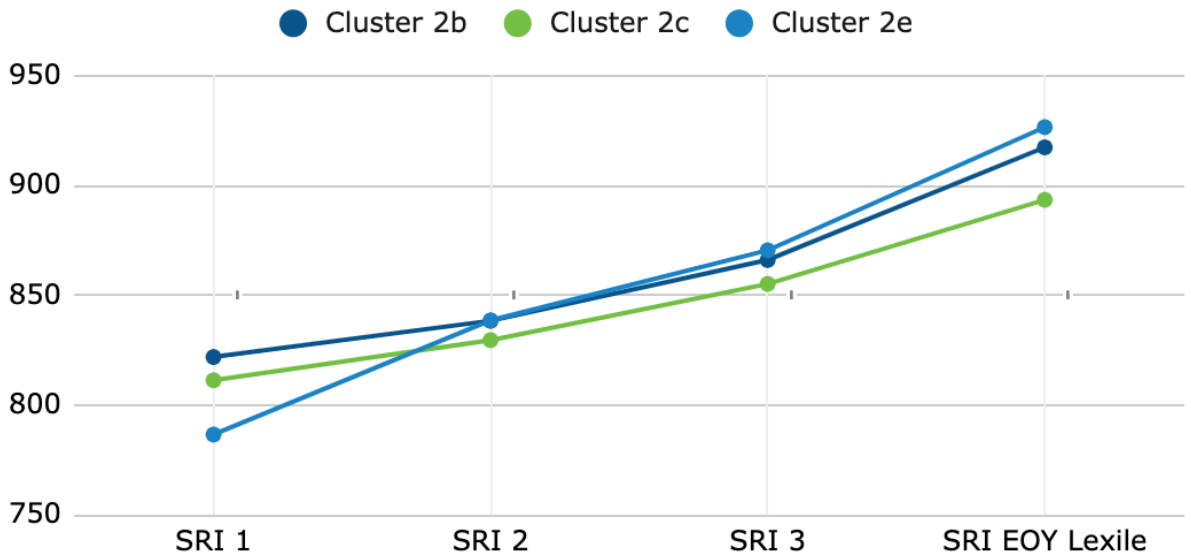


Figure 43: Latent Growth Model for 3-5 English Learners Using SRI Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year)

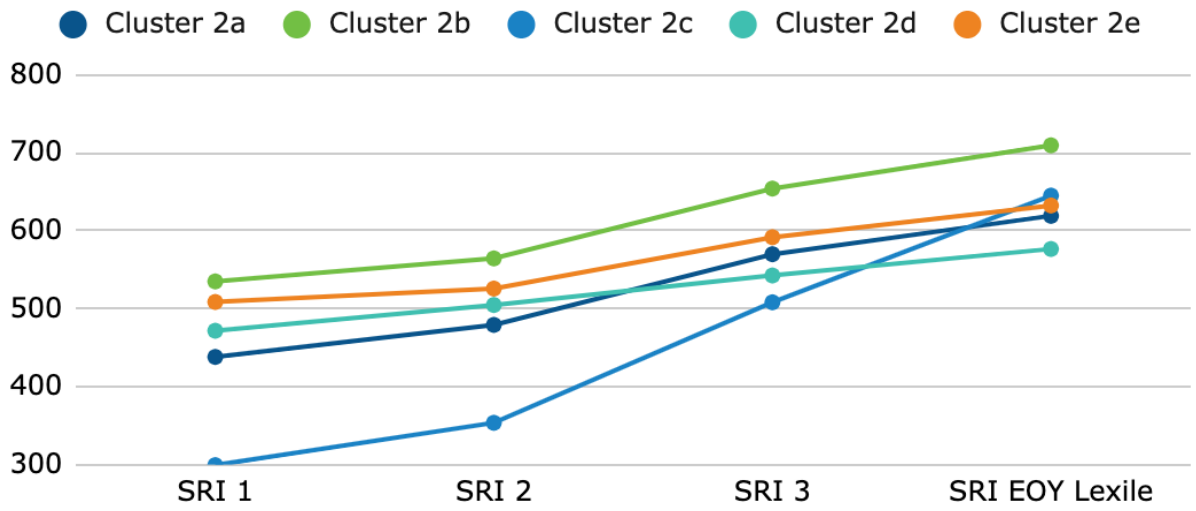


Figure 44: Latent Growth Model for 6-8 English Learners Using SRI Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year)

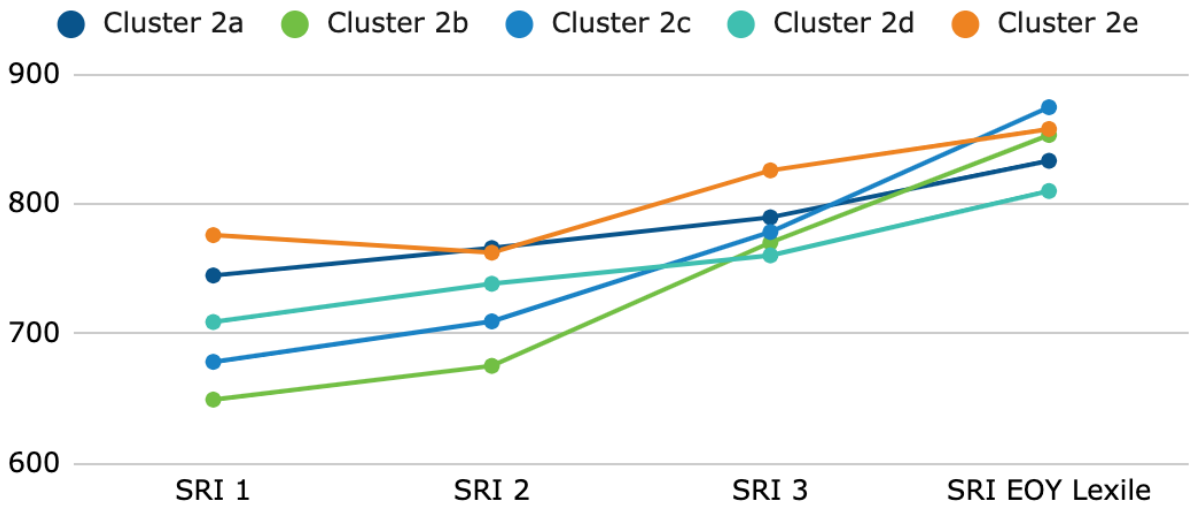


Figure 45: Latent Growth Model for 9-12 English Learners Using SRI Data for the Clusters Defined by PLO Type during Grant Year 2 (2018-19 School Year)

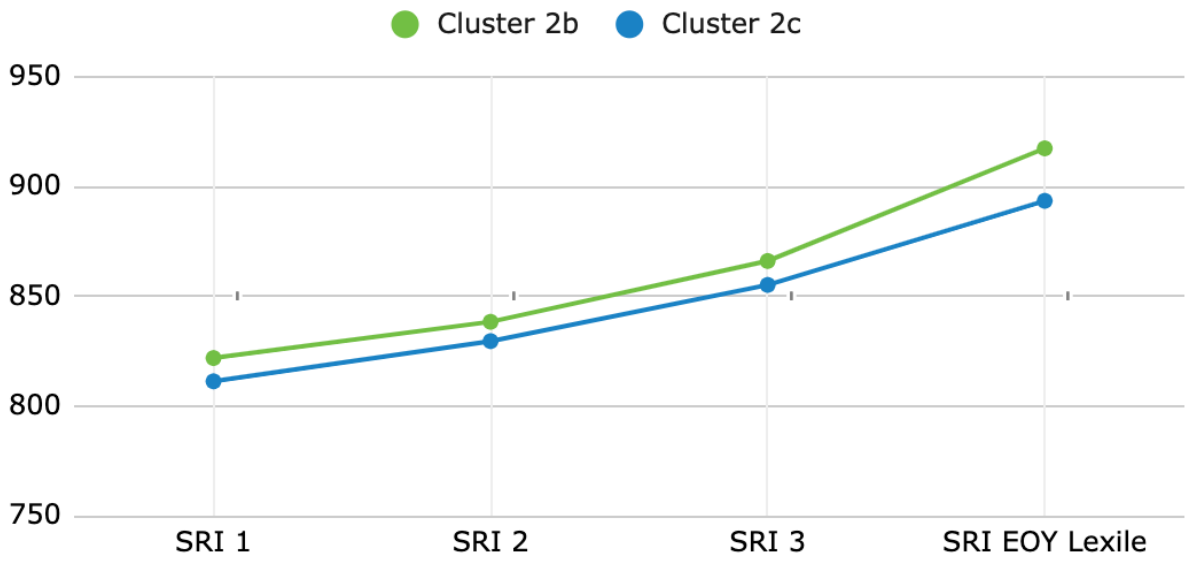


Table 34: Comparison of English Learner SRI Change Scores and Effect Sizes for Clusters Based on PLO Type for Grant Year 1 (2017-18 School Year)

	Content Levels 3-5		Content Levels 6-8		Content Levels 9-12	
	Change Score	Effect Size	Change Score	Effect Size	Change Score	Effect Size
Cluster 1a	222.4	0.007	173.2	0.022	98.6	-0.057
Cluster 1b	192	-0.042	134.6	-0.133	95.5	-0.027
Cluster 1c	185	-0.032	128.6	-0.168	105.3	0.003
Cluster 1d	213.2	0.064	183	0.234	111.2	0.06

Table 35: Comparison of English Learner SRI Change Scores and Effect Sizes for Clusters Based on PLO Type for Grant Year 2 (2018-19 School Year)

	Content Levels 3-5		Content Levels 6-8		Content Levels 9-12	
	Change Score	Effect Size	Change Score	Effect Size	Change Score	Effect Size
Cluster 2a	181	0.041	88.4	-0.036	-	-
Cluster 2b	174.6	0.06	204	0.265	95.5	0.105
Cluster 2c	345.8	0.467	196.3	0.266	82.2	-0.124
Cluster 2d	104.9	-0.248	101	-0.204	-	-
Cluster 2e	123.8	-0.208	81.8	-0.233	-	-

Key Take-Away

Few differences could be detected when examining the effects of professional learning on English Learner reading growth. Similar to the previous analyses, the clusters with both breadth and depth appeared to have the greatest magnitude of effect.

The Effects of PLO Type on English Learner SBAC Prediction

As a final analysis, we ran multilevel models using the SBAC data (both ELA and Math scores) to understand how assignment to the different clusters might predict performance on this summative assessment. In the tables below, we present standardized beta coefficients as the effect size to indicate the direction and magnitude of these predictions. Our findings convey how the cluster predicts performance in ELA and math. As per prior analyses, we examined the effects of each grant year separately and made the following observations:

- During Grant Year 1, assignment to Cluster 1b had a positive effect on predicting learner growth.
- For content levels 3-8, assignment to Clusters 2a, 2b, and 2c all had a positive magnitude of effect when predicting performance on both ELA and math during Grant Year 2.
- Once again, only assignment to Cluster 2C had a positive effect when predicting learner growth for content level 11.

Table 36: Predicted Performance of English Learners Based on Effect Size (beta) in ELA Literacy Score and Math for Grant Year 1 (2017-18 School Year) for PLO Type Clusters

	Content Levels 3-5		Content Levels 6-8		Content Level 11	
	ELA ICC = .12	Math ICC =.09	ELA ICC = .17	Math ICC =.05	ELA ICC = .41	Math ICC =.41
Cluster 1a	-.097	-.055	.078	.098	.169	.063
Cluster 1b	.256	.186	.114	.058	.014	.045
Cluster 1c	-.069	-.105	-.053	-.080	-.115	-.013
Cluster 1d	-.008	.043	-.102	-.048	.045	-.058

Table 37: Predicted Performance of English Learners Based on Effect Size (beta) in ELA Literacy Score and Math for Grant Year 2 (2018-19 School Year) for PLO Type Clusters

	Content Levels 3-5		Content Levels 6-8		Content Level 11	
	ELA ICC =.25	Math ICC =.24	ELA ICC =.36	Math ICC =.25	ELA ICC = .24	Math ICC =.15
Cluster 2a	.124	.023	.114	.152	-	-
Cluster 2b	.070	.058	.046	.087	-.193	-.174
Cluster 2c	.029	.096	.101	.121	.271	.225
Cluster 2d	.017	-.013	-.170	-.243	-	-
Cluster 2e	-.178	-.103	-.044	-.044	-	-

Key Take-Away

Much like with the DRA and SRI, the magnitude of predicted performance was greater in clusters that included learning facilitators who engaged in a variety of different PLO types, particularly Focus Institutes, Learning Academies and Site-based Learning Academies.

As a final data point, we examined the Grant Year 1 cluster assignments of learners who became reclassified, meaning that based on their English Language proficiency they were no longer designated as English Learners in Grant Year 2:

- **Cluster 1a:** 26.4%
- **Cluster 1b:** 14.7%
- **Cluster 1c:** 24.9%
- **Cluster 1d:** 34.0%

Although assignment to Cluster 1b served as a positive predictor of ELPAC performance, it resulted in the lowest percentage of reclassified English Learners. While Cluster 1d had the highest percentage of reclassified learners overall, assignment to this cluster was only a positive predictor of ELPAC performance for learners in content levels 9-11. This is not surprising as most learners tend to reclassify in content levels 6-12, and 70.5% of the learning facilitators in Cluster 1d work with that population.

Key Take-Away

It is difficult to discern whether learning facilitator cluster assignment contributed to English Learner reclassification given the disparate effects of the clusters on ELPAC performance.

Final Discussion and Implications

Through the institution of a professional learning plan funded by its *TSL Empower Lindsay Grant,* LUSD began a personalized professional learning program for the district's learning facilitators and leaders at the start of the 2017-18 School Year. Over the course of three academic years (2017-2020), learning facilitators and leaders have had the option to participate in a range of professional learning opportunities designed to develop their capacity to implement the district's vision of the Ideal Learning Experience. In just the first two years, learning facilitators collectively completed over 1,300 different professional learning opportunities and dedicated thousands of hours to improving their practice.

To demonstrate and document how school systems can create high-quality, personalized, performance-based professional learning approaches, The Learning Accelerator (TLA) worked in partnership with the LUSD leadership team to answer the overarching question: ***Which professional learning pathways or combinations are most powerful for increasing learner growth?*** This report presented an initial, holistic analysis of the professional learning that occurred in association with the TSL grant during the first two years.

Three research questions ultimately allowed us to examine which combinations of activities had the greatest impact on learner achievement:

1. How did engaging in different types of professional learning opportunities affect learner outcomes?
2. Which clusters of professional learning opportunities emerged in terms of the combinations of professional learning and in terms of duration (measured in hours)?
3. Which combinations of professional learning - both in terms of type and duration - had the greatest effect on learner achievement as measured by the various learner assessments, and which combinations had the greatest effect within the English Learner population?

The analysis in this report utilized a combination of formative and summative assessment data to address these questions and determine how participation in various professional learning opportunities might predict learner growth. As a result of this work, three key findings emerged.

Finding #1 - The Need for Multiple Types of High-Quality Professional Learning

Learning facilitators in LUSD could choose from a menu of professional learning opportunities that differed in terms of topic, level of development, time commitment, and performance-based

compensation. Therefore, it was critical to understand whether any particular type of professional learning might have a more substantial effect on learner growth.

An analysis of the end of year scores on both formative reading assessments as well as summative assessments in ELA and math revealed that no single type of professional learning had a considerable impact.

We attribute this finding to two factors. First, many learning facilitators engaged in more than one type of professional learning; and second, all of the professional learning opportunities adhered to at least one of the conventionally recognized principles[21] as outlined below:

- **Time:** extended duration, such as with Learning Academies or TIE Courses, can be associated with teacher improvement
- **Focus:** opportunities such as Focus Institutes that address specific content areas or skills are more likely to translate into practice
- **Active Learning:** educators find greater benefit when they can engage in hands-on learning such as lesson planning and direct observation, both of which occurred with the Micro Credentials
- **Relevance:** professional learning that directly relates to daily practice, such as with the Site-based Learning Academies, tends to result in improved classroom performance

To account for the fact that learning facilitators participated in multiple professional learning opportunities, we conducted cluster analyses to identify groups based on similarities in engagement both in terms of the types of professional learning opportunities and the number of PLOs completed. Across both grant years, those clusters that included a variety of PLO types - particularly some combination of Focus Institutes, Learning Academies, Site-based Learning Academies, and Micro Credentials - tended to have a greater magnitude of effect on both formative and summative assessments.

Implication for Future Practice: As a result of these various analyses, we suggest that LUSD continue to offer multiple types of high-quality professional learning opportunities. Additional analysis in the future, which will be discussed in the conclusion of this report, may yield additional insights to potentially narrow the types, content, or formats of professional learning opportunities in the future.

[21] Garet, M., Birman, B., Porter, A., Desimone, L., Herman, R. (1999). *Designing effective professional development: lessons from the Eisenhower Program [and] technical appendices*. http://files.eric.ed.gov/fulltext/ED442634.pdf

Finding #2 - The Need for Breadth and Depth

Given our analysis of existing professional learning literature, we hypothesized that dose, or the duration of participation, would also be important. Multiple studies[22] presented evidence that sustained professional learning – that which occurred over extended periods of time – resulted in greater improvements to student outcomes. Within this LUSD study, depth manifested in two different ways.

By design, some professional learning opportunities provided learning facilitators with greater opportunity for depth. For example, Master's Courses and TIE Courses required significant time investments over extended periods. Similarly, Learning Academies, Site-based Learning Academies, and Micro Credentials all incorporated multiple face-to-face workshops and ongoing coaching.

On the contrary, Focus Institutes followed more of a traditional "one-and-done" workshop model. Learning facilitators could complete in a single day and then move on. While the previously mentioned studies found this form of professional learning to be relatively ineffective, our analysis did not result in the same finding. We believe that this is because some learning facilitators completed more than one Focus Institute or combined Focus Institutes with other professional learning opportunities.

For these reasons, we conducted cluster analyses based on dose, calculated as average duration in hours. Although we hypothesized that a positive relationship might exist between duration of professional learning and learner growth, the effects varied, especially by content level. We attribute this finding to a combination of factors. First, fewer learning facilitators could be categorized as *High* or *Moderately High*, so discrepancies existed in terms of sample size. Second, because of the disproportionate amount of time required to complete Master's Courses, the High category largely consisted of just those few learning facilitators. Finally, especially by Grant Year 2, the majority of learning facilitators had received far more than the minimum amount of time suggested by the literature as being required to see improvement. As such, we concluded that the duration in hours may not serve, in and of itself within the LUSD context, as a distinguishing factor.

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[22] Dede, C., Ketelhut, D., Whitehouse, P., Breit, L., McCloskey, E. (2008). *A Research agenda for online teacher professional development. Journal of Teacher Education, 60*(1), 8 - 19. https://dx.doi.org/10.1177/0022487108327554
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On the contrary, clusters that contained both a variety of different PLO types and a higher average completion rate had a greater likelihood to predict a positive magnitude of effect. For example, during Grant Year 1, Cluster 1c - which averaged 2.56 Focus Institutes in addition to Learning Academies and Micro Credentials - had the greatest effect on DRA scores for K-2 learners. Assignment to Cluster 1b, which had slightly fewer Focus Institutes but more Micro Credentials, predicted positive gains in ELA and math on the SBAC for learners in content levels K-8. Similarly, in Grant Year 2, assignment to Cluster 2b had a positive effect on learners' SRI scores. Learning facilitators in that cluster participated in numerous Focus Institutes, Learning Academies, and Site-based Learning Academies. **Given that all of these clusters not only included multiple types of PLOs but also multiple opportunities, we conclude that both breadth and depth likely led to improved learner growth.**

Implication for Future Practice: after examining the types of PLOs offered to learning facilitators and the amount of time that they spent engaged in professional learning, we believe that both breadth and depth matter. LUSD should continue to encourage learning faciltiators to engage in multiple types of professional learning over a sustained duration of time. Future studies may also examine additional learning facilitator attributes such as level of experience to make more specific recommendations on combinations of breadth and depth.

Finding #3 - No Single Pathway for All Learners

At the heart of personalized learning lies the assumption that individual learners require different pathways and supports. LUSD has extended this belief to its learning facilitators and designed a professional learning program that allows for choice, different levels of need or expertise, and personal agency. While the analyses in this report attempted to ascertain which combinations of professional learning opportunities would lead to the greatest student growth, **one clear finding emerged: no singular pathway exists for all learners.**

Whether examining the effects of professional learning on formative reading data or summative SBAC scores, variation existed across content levels. For example, in Grant Year 1, assignment to Clusters 1a and 1d had a positive magnitude of effect on reading growth for K-8 learning facilitators, but not 9-12. Meanwhile, in Grant Year 2, membership in Cluster 2b positively affected all content levels' reading growth, but did not predict growth in ELA or math for content levels 6-8 or 9-12.

When focusing specifically on English Learners, not only did variation exist across content levels but also when considering reclassification. Even though cluster assignment might positively predict ELPAC performance, it did not necessarily correlate with the percentage of students who could be reclassified as English proficient.

Implication for Future Practice: Given that no single solution emerged from these analyses, we believe that this data validates the district's current approach to professional learning. LUSD should continue to approach the development of its learning facilitators in much the same way as its students: with an eye to personalization. Therefore, the district should continue to offer sustained, high-quality opportunities and encourage pathways that promote both breadth and depth.

Final Take-Away

Since this report exists as just the initial analysis, future reports will need to examine these trends in more detail and also should address the following:

- **How the content or topic of the professional learning affected learner growth**. Expanding on the findings from the Guided Reading research, examine whether learning facilitators who participated in content-specific PLOs saw greater growth in those particular content areas.
- Rather than just look at the effects of professional learning at the content level, **ascertain the impact within individual learning communities**. This is particularly salient given the prevalence of Site-based Learning Academies in Grant Year 2, varying participation rates across learning communities, and different learning facilitator as well as learner attributes.
- This initial report only used formative reading data and summative performance data in ELA and math as learner measures. **Additional learner information may provide a more thorough understanding of which combinations of professional learning most benefited which learners across all content levels** and should be incorporated into future analyses.

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Appendix A - Professional Learning Opportunities

Grant Year 1 (2017-18 School Year)

Focus Institutes	
Content Literacy #1	Participants learned to engage learners with content-focused reading strategies and comprehension tools, and deepened their knowledge of how to integrate nonfiction literacy strategies into any content area to foster learners' comprehension, conceptual learning and retention, and engagement.
Content Literacy #2	Participants learned to engage learners with reading and writing strategies and deepened their knowledge of backwards design lesson planning and the integration of literacy strategies, including vocabulary, reading comprehension, and writing to learn.
Designated ELD	Participants learned explicit strategies for English Learners from the BELIEF K-8 and HS DESIGNATED ALL CONTENTS & LEVELS framework by Stanford and CDE toolkit as well as enhanced their knowledge of lesson design, designated strategies, and alignment to ELA/ ELD claims and targets.
ELD #1	Participants learned to prepare English Learners to have in-depth conversations about content area concepts and topics as well as developed their skills in teaching learners how to have academic conversations.
ELD #2	Participants learned procedures to support English Learners in language acquisition, academic vocabulary, listening, and comprehension as well as developed lesson plans using grade level appropriate resources and improved their knowledge of lesson design.
Empower	Participants learned the key components and basic navigational features of *Empower*, including scoring functions as well as activity and playlist development.
Lifelong Learning	Participants learned the purpose and need for lifelong learning, gained a deeper understanding into the spheres of lifelong learning, and developed the skills to integrate lifelong learning content meaningfully into academic core instructional units.
Math Big 5	Participants explored the three components (Dots, What's My Place? What's My Value?, and Calendar Baits) of Head-Pollett Math. Participants improved their understanding of how to use these components to support Common Core instruction in the Math Big 5.
Word Work	Participants gained an in-depth understanding of the phonemic, phonetic, and orthographic components of literacy instruction from pre-readers to fluent readers. This hands-on workshop focused on Jan Richardson's highly engaging, efficient, and effective word study activities that increase word-level reading proficiency, automaticity with reading and writing sight words, fluency, and writing skills.

Learning Academies	
Blended Learning	Participants learned and applied the basics of blended learning, how to motivate learners through blended learning models, and a plan establishing the culture and instructional approach of technology-rich instruction.
Content Literacy	Participants learned to “kick the habit” of hovering, over-explaining, and rescuing learners rather than guiding them to be more self-reliant for content area literacy. Participants expanded their knowledge and application of how to integrate content-based literacy tasks, strategies for learning coaching, and scaffolding approaches to meet learners at all levels.
Designated ELD	Participants gained explicit strategies for designing and implementing designated ELD. Participants improved their knowledge and application of language acquisition strategies, the particular needs of Long Term English Learners, and formative assessment design.
Digital Skills for Customized Learning	Participants developed the technical and cognitive skills necessary to search, evaluate, and curate information in order to solve problems digitally. Participants learned to utilize these skills and processes to collaborate and share solutions to real-world issues as well as familiarize themselves with the concept of a digital identity.
Fast Runners: Extended Understanding	Participants designed an environment that supports the unique needs of learners with exceptional skills and abilities that may be considered “fast runners,” including curriculum and instructional strategies as well as application of professional practices for Creativity, Motivation and Guidance.
Guided Reading	Participants learned how to plan powerful, systematic guided reading lessons. They learned each of Jan Richardson's five guided reading routines from Pre-A through Fluent. These routines are appropriate for pre-readers through Fluent readers as well as across all elementary content levels.
Project-Based Learning 101	Participants gained an understanding of the Gold Standard design principles of Project Based Learning and applied this learning through the design or adaptation of a project for their learning environment. Participants also learned and applied strategies to facilitate the project, build classroom culture, and assess learning.

Micro Credentials	
Project-Based Learning 101	Participants gained a deeper understanding of the Gold Standard design principles of Project Based Learning and applied this learning through the design or adaptation of a project for their learning environment to build classroom culture and assess learning.
Customized Learning	Participants learned and applied open educational resources to support the creation of flexible classroom curriculum materials. By employing backward mapping strategies, participants developed various learning pathways for learners that aligned with assessments and created opportunities for more complex understanding.
First Quality Instruction	Through virtual support from a Better Lesson Coach, participants worked to impact learner growth. Together with their Coach, learning facilitators identified specific learner needs and selected strategies to address challenges and opportunities.
Integrated ELD	Participants learned to bring Integrated ELD to life in their environments and accelerate language acquisition for English Learners. They increased their knowledge and application of the ELD standards, key components of integrated lesson design, formative assessments, and differentiation based on learner needs.

Grant Year 2 (2018-19 School Year)

Focus Institutes - ELA/ELD	
Content Literacy for Nonfiction	Participants learned to engage learners with content-focused reading strategies as well as how to integrate nonfiction literacy strategies into any content area.
Content Literacy Tasks	Participants learned how to integrate literacy strategies, including vocabulary, reading comprehension, and writing to learn.
Interactive Reading & Writing	Participants learned the role and value of interactive reading/writing as well as how to plan, structure, and deliver an interactive reading/writing lesson.
Designated ELD	Participants learned the design of Designated ELD, including how to identify language demands of content, build language objectives, and target instruction.
ELPAC Task Types	Participants deconstructed the ELPAC's 4 Domains and learned to design ELPAC task supportive strategies as well as infuse language practices into learning experiences.
Making Meaning in ELD	Participants built awareness of responsive ELD instruction connected to close reading of complex text and strategies.
Teaching the Writing Process	Participants explored the writing process, including strategies to build learner independence, and to use mini-lessons to explicitly teach skills and strategies.

Focus Institutes - Science	
Claim Evidence -Reasoning	Participants learned how to facilitate effective Claim Evidence Reasoning using STEMscopes instructional strategies.
Hands-on Science with STEMscopes	Participants learned how to use STEMscopes instructional labs to provide learners with fun, meaningful, hands-on lab experiences.
Dual Immersion Science	Participants learned specific strategies for using STEMscopes in Dual Immersion environments to increase learner achievement.
30-Minute Science	Participants learned how to plan and use STEMscopes resources efficiently to make teaching science doable and increase learner achievement.
Supporting ELs in Science	Participants learned how to use STEMscopes resources to best support English Learners and their language development through science.
Science for High Stakes Exams	Participants learned how to use STEMscopes to support learners in mastering the NGSS learning targets through integrated instruction.
Scientific Literacy	Participants practiced using STEMscopes resources to strengthen learners' scientific literacy.

Focus Institutes - Mathematics	
Progression of Mathematics	Participants learned specific strands of the Common Core State Standards and how to build on previous learning.
Growth Mindset in Math	Participants dove into the impact of learners' mindsets and learned strategies to develop learners' growth mindset in math.
Teaching Math with Technology	Participants learned how to integrate technology into their instruction, including the use of DESMOS, graphing calculators, and Geogebra.

Focus Institutes - Lindsay Learning	
Adult Learning Curriculum Look Fors	Participants dove into the principles of the Adult Learning Curriculum, including the theory, instructional strategies, and how to develop professional mastery.
Empower	Participants discovered basic navigational features of *Empower*, including newly added features, scoring functions, as well as activity and playlist development.
Lifelong Learning	Participants learned the purpose and need for Lifelong learning, gained a deeper understanding into the spheres, and developed the skills to integrate them in a meaningful way.

Focus Institutes - History/Social Science	
Literacy in History/Social Science	Participants examined and explored the new History-Social Science (HSS) framework and its framework around building literacy through interactive discovery.
Creating Engagement Using Primary Sources	Participants discovered how to foster inquiry-based and investigative learning opportunities in history and social studies content areas through primary sources.
Authentic Assessment in History/SS	Participants examined numerous alternatives for assessment, explored a variety of valuable assessment formats and rubrics, and developed fresh approaches to authentic assessment.

Focus Institutes - Customized Learning	
Customized Learning	Participants learned about open educational resources to support the creation of flexible curriculum materials and the development of learning pathways for learners.
Digital Skills	Participants learned the technical and cognitive skills necessary to search, evaluate, and curate information for instruction in the digital era.
Project-Based Learning 201	Participants increased their understanding of the Gold Standard design principles of Project Based Learning, including project design and assessment.

Learning Academies	
Guided Reading 101	Participants became familiar with the four elements of Jan Richardson's guided reading plan and how to plan powerful, targeted guided reading lessons.
Guided Writing 101	Participants learned how to plan powerful and targeted guided reading lessons using Jan Richardson's framework, with a special emphasis on guided writing.
Cognitively Guided Instruction	Participants learned the foundation of cognitively guided instruction and how to use learner knowledge to help them design and implement mathematics lessons.
Blended Learning	Participants learned and applied the basics of blended learning, discovering how to motivate learners through blended learning models and implement technology-rich instruction.

Micro Credentials	
Personalized Learning	Through virtual support from a Better Lesson Coach, participants collaborated with their coach to set goals, develop strategies, and impact learner growth.
National STEM Educator	Participants learned and applied the goals of STEM education and how to incorporate it in the learning environment.
Guided Reading 201	Participants developed their understanding of Jan Richardson's Guided Reading routines and instructional strategies, including a deep dive into Chapter 7.
Project-Based Learning 101	Participants learned and applied the Gold Standard design principles of Project Based Learning through the design and implementation of a project for their learners.

TIE Courses	
Flipped Classroom	Now that more schools are embracing the use of technology, the Flipped Classroom has become a great first step towards customized learning. It can be done in any grade level, for any subject. This training covered the basics of Flipped Learning, tools to make videos, assessment, how to use the extra class time meaningfully, and the pros and cons of this method.
Learner Engagement	This course used the book "Eight Myths of Student Disengagement" to investigate how classroom practices influence engagement, including types of tasks assigned, quality of facilitator-learner relations, and peer dynamics. The course encouraged participants to recognize that engagement is not just on-task behavior, but also incorporates behavioral, emotional, and cognitive practices. Participants considered a variety of instructional practices and their connection to learner engagement.
Project-Based Learning	Project-Based Learning offers more meaningful and engaging lessons for learners. The traditional classroom, where learning occurs in the vacuum of separate and distinct islands, will soon be replaced by interconnected curriculum via authentic inquiry based learning experiences. One of the goals for this class was to expose participants to these resources and help them develop their own personal notion of Project-Based Lessons within the context of their own learning environment.
Online Learning	Much goes into the design of an online course. This course used many articles and videos for research and the opportunity to create an online class. The module covered defining the learning environment, active learning, real-world application, assessment, differentiation, ethics, as well as other topics.
Learner Motivation: *Teaching From Within*	The challenge of motivating learners to learn has been central to the teaching profession throughout history. Unfortunately, many motivational strategies have had the opposite of their intended effect on learners. This course is built around concepts explored in Bob Sullo's book, *The Motivated Student* and the 2012 TIE Media film, *Teaching From Within*. *Teaching From Within* is a film and a way of teaching that promotes an inside-out (intrinsic) approach to learning. Participants analyzed their own and their school's approaches to motivating learners, viewed the film itself, explored research around learner motivation, and developed goals and approaches for beginning the shift from problematic external motivational approaches to teaching and learning that comes from within.
Blended Learning	The class used the eBook *Blended-Using Disruptive Innovation to Improve Schools* as the main text, as well as some articles and videos. The course incorporated four phases to help implement a Blended Learning environment: What is Blended Learning, what could it mean for you, and how can you move to a Blended Learning environment in your classroom? A unit on how to assess in the Blended Learning classroom was also included in this course.

TIE Courses — Continued	
Culturally Responsive Classroom	What is culturally responsive teaching? In what ways does implicit bias affect teaching practice? How do I connect with learners from different racial, socio-economic, or cultural backgrounds? This course enabled facilitators to create a classroom environment that is culturally responsive in order to answer these questions.
Learner Agency	As education evolves toward customized learning, the need for self-directed learners becomes critical for the learning environment. With learners at different places in the curriculum, working on several projects and in changing physical environments, learners will need to develop a strong sense of personal responsibility. The Learner Agency work done at TIE supports educators on implementing these ideas. This course introduced participants to tools and resources to support this work.
Digital Literacy	As education evolves toward customized learning, digital literacy skills become absolutely critical – unfortunately, most learners and educators "don't know what they don't know." In this course, participants examined the importance of learners acquiring vital digital literacy skills for better problem solving as well as implications for using digital tools in a customized environment.
Flexible Curriculum	Flexible Curriculum used videos, articles, and websites to develop a deeper understanding of designing, using, and sharing flexible curriculum. Participants explored a variety of sites to help consider pace, place, path, and time for learners.

Appendix B - Cluster Composition by Learning Community

Cluster Composition by PLO Type

The tables below illustrate the composition of each cluster by learning community. Each table shows the number of learning facilitators who completed each PLO type in each community. The clusters are broken down by grant year.

Grant Year 1 (2017-18 School Year)

Table B1: Cluster 1a Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	3	5	1	1
Kennedy Elementary	3	7	2	0
Lincoln Elementary	2	4	0	0
Lindsay High School	5	5	0	0
Reagan Elementary	5	3	0	0
Roosevelt Elementary	7	8	1	1
Washington Elementary	7	5	1	0

Table B2: Cluster 1b Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	6	2	3	2
Kennedy Elementary	2	0	1	0
Lincoln Elementary	2	0	1	0
Lindsay High School	6	0	3	2
Roosevelt Elementary	2	1	1	0
Washington Elementary	7	0	3	3

Table B3: Cluster 1c Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	19	6	2	0
John J. Cairns Continuation	5	0	1	0
Kennedy Elementary	14	3	0	0
Lincoln Elementary	14	4	0	1
Lindsay High School	22	6	1	1
Reagan Elementary	11	2	0	0
Roosevelt Elementary	11	5	0	0
Washington Elementary	26	5	1	1

Table B4: Cluster 1d Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	0	0	0	0
John J. Cairns Continuation	0	0	0	0
Kennedy Elementary	0	0	0	0
Lincoln Elementary	0	0	0	1
Lindsay High School	0	0	2	0
Reagan Elementary	0	0	0	1
Roosevelt Elementary	0	0	0	0
Washington Elementary	0	0	1	0

Grant Year 2 (2018-19 School Year)

Table B5: Cluster 2a Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	78	9	10	42	6	0
Kennedy Elementary	49	7	1	39	7	0
Lincoln Elementary	28	2	2	12	0	1
Roosevelt Elementary	48	6	4	38	0	0
Washington Elementary	43	5	3	40	3	0

Table B6: Cluster 2b Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	18	5	3	10	0	0
John J. Cairns Continuation	15	1	1	0	0	0
Kennedy Elementary	7	2	2	0	0	0
Lincoln Elementary	33	8	2	22	3	0
Lindsay High School	43	7	6	0	5	1
Reagan Elementary	47	9	6	0	2	2

Table B7: Cluster 2c Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	1	1	0	3	0	0
John J. Cairns Continuation	3	0	1	0	0	0
Lincoln Elementary	0	0	0	3	0	0
Lindsay High School	19	15	14	0	29	4
Reagan Elementary	9	7	4	0	3	0
Washington Elementary	2	1	0	0	6	0

Table B8: Cluster 2d Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	6	3	1	15	3	1
Kennedy Elementary	1	0	0	31	0	0
Lincoln Elementary	6	1	1	24	3	0
Roosevelt Elementary	2	3	0	37	4	0
Washington Elementary	11	7	4	49	9	0

Table B9: Cluster 2e Number of Different PLO Types by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Kennedy Elementary	22	3	0	28	0	3
Roosevelt Elementary	46	16	6	101	0	0
Washington Elementary	104	19	11	168	2	0

Cluster Composition by Duration of Professional Learning

The tables below illustrate the composition of each dose cluster (i.e., high, moderate, low duration of participation measured in hours) by the learning community. Each table shows the number of learning facilitators who completed each PLO type in each community. The clusters are broken down by grant year.

Grant Year 1 (2017-18 School Year)

Table B10: High Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	5	4	2	3
Lincoln Elementary	3	1	0	2
Lindsay High School	6	1	1	3
Reagan Elementary	0	0	0	1
Roosevelt Elementary	0	1	0	1
Washington Elementary	6	1	1	4

Table B11: Moderately High Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	19	6	4	0
John J. Cairns Continuation	3	0	1	0
Kennedy Elementary	6	6	2	0
Lincoln Elementary	8	2	1	0
Lindsay High School	18	8	1	0
Reagan Elementary	4	2	0	0
Roosevelt Elementary	10	5	2	0
Washington Elementary	7	6	2	0

Table B12: Moderately Low Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	3	3	0	0
Kennedy Elementary	13	4	1	0
Lincoln Elementary	7	5	0	0
Lindsay High School	6	2	4	0
Reagan Elementary	8	3	0	0
Roosevelt Elementary	9	8	0	0
Washington Elementary	13	3	3	0

Table B13: High Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Master's Courses
Jefferson Elementary	1	0	0	0
John J. Cairns Continuation	2	0	0	0
Kennedy Elementary	0	0	0	0
Lincoln Elementary	0	0	0	0
Lindsay High School	3	0	0	0
Reagan Elementary	4	0	0	0
Roosevelt Elementary	1	0	0	0
Washington Elementary	14	0	0	0

Grant Year 2 (2018-19 School Year)

Table B14: High Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-Based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	16	4	3	15	9	0
Kennedy Elementary	7	2	1	6	7	0
Lincoln Elementary	10	2	0	8	6	0
Lindsay High School	11	7	6	0	27	0
Reagan Elementary	3	2	1	0	3	0
Roosevelt Elementary	0	2	0	11	4	0
Washington Elementary	14	5	2	29	18	0

Table B15: Moderately High Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	11	1	3	5	0	0
Lindsay High School	8	2	2	0	7	0
Reagan Elementary	9	2	1	0	2	1
Roosevelt Elementary	39	5	3	29	0	0
Washington Elementary	38	10	9	50	2	0

Table B16: Moderate Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	68	10	8	33	0	0
John J. Cairns Continuation	6	1	1	0	0	0
Kennedy Elementary	40	8	2	27	0	0
Lincoln Elementary	45	6	4	24	0	1
Lindsay High School	16	1	4	0	0	0
Reagan Elementary	16	3	2	0	0	0
Roosevelt Elementary	47	16	6	93	0	0
Washington Elementary	76	15	7	117	0	0

Table B17: Moderately Low Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	8	3	0	12	0	1
John J. Cairns Continuation	9	0	0	0	0	0
Kennedy Elementary	31	2	0	34	0	3
Lincoln Elementary	12	3	1	14	0	0
Lindsay High School	25	12	7	0	0	3
Reagan Elementary	28	9	6	0	0	1
Roosevelt Elementary	10	2	1	43	0	0
Washington Elementary	31	2	0	54	0	0

Table B18: Low Dose Cluster by Learning Community

Learning Community	Focus Institutes	Learning Academies	Micro Credentials	Site-based Learning Academies	Master's Courses	TIE Courses
Jefferson Elementary	0	0	0	5	0	0
John J. Cairns Continuation	3	0	1	0	0	0
Kennedy Elementary	1	0	0	31	0	0
Lincoln Elementary	0	0	0	15	0	0
Lindsay High School	2	0	1	0	0	2
Reagan Elementary	0	0	0	0	0	0
Washington Elementary	1	0	0	7	0	0

About this Project

This report was developed as part of a multi-stage data science project for Lindsay Unified School District's federally funded Teacher and School Leader Incentive Program. This 18-month project is supported by The Learning Accelerator (TLA) and Yet Analytics. The LearnPlatform team provided additional analytical capacity for this report.

TLA, the lead research partner and co-author of this report, is a national nonprofit that makes the 'potential' possible and practical for every teacher and every learner. TLA envisions a future in which each student receives an effective, equitable, and engaging education – one that is informed by data and supported by technology – enabling them to reach their full and unique potential. Its mission is to connect teachers and leaders with the knowledge, tools, and networks they need to enact personalized and mastery-based practices to transform K-12 education.

Yet Analytics, a Baltimore-based software firm, is a leading provider of data technology solutions to learning and training organizations and aims to make learning data more accessible, visible, and actionable.

LearnPlatform is a software company with the mission to expand equitable access for all students to teaching and education technology that works.

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