



# LETRS Implementation & Impacts in Multnomah County



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# Executive Summary

In late 2021, Portland Public School District, in partnership with the Multnomah Education Service District (MESD), submitted a proposal to the Oregon Department of Education suggesting the use of GEER-II dollars to fund an independent evaluation of LETRS implementation and outcomes across the five Multnomah County school districts during the 2022-2023 school year. Ultimately, the study would aim to provide information that supports state-level decisions about whether and how to invest in LETRS training statewide.

Over the course of two years, participants from five Multnomah County school districts engaged in the Language Essentials for Teachers of Reading and Spelling (LETRS) professional learning program for early childhood educators, which is focused on early literacy and language foundations. The five districts investing in LETRS training include Portland Public Schools (PPS), Reynolds School District, David Douglas School District (DDSD), Parkrose School District, and Centennial School District. In partnership with the Multnomah Education Service District (MESD), PPS received funding in 2022 to support implementation of LETRS across these five districts, in addition to funds from the Oregon Department of Education for an independent study of LETRS implementation and outcomes. The independent study was completed by Pacific Research and Evaluation (PRE) and included educator surveys, educator focus groups, administrator interviews, and points of contact interviews, as well as an assessment of the impact of LETRS on teacher and student outcomes in the 2022-2023 school year. A summary of the findings is presented below and covers the topic of implementation and context, as well as the five levels of Guskey's model for evaluating professional learning programs: Participants' Reactions (Level 1); Participants' Learning (Level 2); Organizational Support and Change (Level 3); Participants' Use of New Knowledge and Skills (Level 4); and Student Learning Outcomes (Level 5).

## Implementation and Context

A majority of LETRS participants across the five districts were classroom teachers and typically instructed kindergarten through fifth grade. Participants most often became involved in LETRS to enhance knowledge of and develop foundational skills in reading instruction, to meet students' needs/better equip students to learn to read, to support readers who need extra support, and to understand the science of reading. Of those participating, nearly ninety percent had completed Volume 1 of LETRS training.

## Level 1: Participants' Reactions

Reactions to the LETRS training were generally positive. Participants reported that they enjoyed the training and found it more useful and relevant than other literacy-related professional development opportunities. Participants explained that the training goes beyond typical reading curricula for educators by providing more in-depth knowledge around the science of reading, phonemic awareness, and brain development. Participants also appreciated the research-based content and its applicability.

## Level 2: Participants' Learning

LETRS participants reported that the training had increased both their knowledge of and their skill with literacy instruction, which led to enhanced skills and application in the classroom. A deeper understanding of the science of learning allowed educators to identify gaps in resources and curriculum and fill those

gaps more effectively. Educators perceive that the LETRS training has given them a better understanding of the science of reading and has increased their skills more than other literacy-related training they had completed.

### **Level 3: Organizational Support and Change**

Some districts were supporting educators by providing monetary compensation or protected time to complete LETRS training. Centennial, PPS, and Reynolds were offering financial support, while Reynolds also provided dedicated time to focus on training and homework. Districts also supported educators by providing materials needed to complete the training and materials to implement it in the classroom. Further, some districts supported educators through coaching, TOSAs, and learning specialists. The most common barrier to LETRS participation was a lack of compensation and the time needed to complete the program. Many educators had to commit non-contract hours to complete the program, and the time commitment led to attrition in some cases.

### **Level 4: Use of New Knowledge and Skills**

LETRS participants reported that the LETRS training had changed their instructional practices and positively impacted how they carry out their job; they also indicated that they were able to put their LETRS training to use right away in their instructional practices. Administrators observed that LETRS trained teachers are able to identify the specific needs of individual students to determine what they can do more precisely to help, while participants noted that the training had positively impacted their ability to serve students from historically underserved subgroups. A lack of time for material and curriculum preparation made transferring of LETRS information to education practices difficult for educators.

### **Level 5: Student Learning Outcomes**

Educators across districts perceive that LETRS training has positively impacted the literacy outcomes of students. Participants also generally felt that the combination of the literacy curriculum in their district and their application of LETRS training was positively impacting student outcomes. Literacy assessment scores were examined by comparing results for students with LETRS-trained teachers to those with teachers not trained in LETRS. Some of the findings were promising even with many teachers still in the early stages of their LETRS training. Specifically, Reynolds School District and David Douglas School District both showed promising findings with students of LETRS trained teachers showing higher rates of reading at grade level than a comparison group. DDSO showed particularly promising findings as detailed below:

- When considering grades K-5, students of LETRS trained teachers were **1.71 times more likely** to have a Spring reading composite score at or above benchmark compared to students of non-LETRS trained teachers.
- When considering ELL students in grades K-5, students of LETRS trained teachers were **2.67 times more likely** to have a Spring reading composite score at or above benchmark compared to ELL students of non-LETRS trained teachers.
- When considering HU students in grade K-5, students of LETRS trained teachers were **1.51 times more likely** to have a Spring reading composite score at or above benchmark compared to ELL students of non-LETRS trained teachers.

# Introduction

Language Essentials for Teachers of Reading and Spelling (LETRS) is a professional learning program for early childhood educators and administrators focused on early literacy and language foundations. LETRS is offered by Lexia Learning, a company focused on literacy education. While other science of reading training programs are offered by other companies, those programs vary in density, length, and model. Over a two-year period, LETRS participants engage in online units, face-to-face sessions, readings, and dedicated time to practice applying skills in the classroom, with learning measured by quizzes, tests, and document submission. Within Multnomah County, five districts have begun investing in LETRS training, including Portland Public Schools (PPS), Reynolds School District (RSD), David Douglas School District (DDSD), Parkrose School District (PSD), and Centennial School District (CSD). In late 2021, Portland Public Schools, in partnership with the Multnomah Education Service District (MESD), submitted a proposal to the Oregon Department of Education requesting the use of GEER-II dollars to fund an independent evaluation of LETRS implementation and outcomes across the five named districts during the 2022-2023 school year. Ultimately, the study would aim to provide information that supports state-level decisions about whether and how to invest in LETRS training statewide.

Pacific Research and Evaluation (PRE) was selected through a competitive bid process to complete the independent study. In addition to a literature review on the impacts of LETRS training in similarly situated districts who have utilized LETRS for a longer period of time, the study was designed to include formative evaluation to assess program implementation across the five identified districts in Multnomah County and summative evaluation to assess the impact of LETRS on teacher and student outcomes in the 2022-2023 school year. A critical factor in the evaluation methodology is that LETRS training is designed to take up to two years, and four of the five districts included did not yet have any educators who had fully completed LETRS training as of the midpoint of the 2021-2022 school year. As such, student achievement outcomes will be considered to the extent feasible, but the primary focal points of the study will be program implementation and teacher-, school-, and district-level outcomes.

The purpose of this project is to study and learn from different models of LETRS implementation and support across five districts in Multnomah County to better understand the conditions and supports required to ensure that LETRS training results in the consistent, quality implementation of research-based teacher practices and, most importantly, improved student reading outcomes for our historically underserved students. This study is being designed to (1) support collaboration and data-based project planning within and across the participating districts and (2) inform the Oregon Department of Education as to whether and how greater statewide investment in LETRS training could lead to improved student outcomes in reading across our state. Given the important benchmark of 3rd grade reading, it proposed that this study focus specifically on LETRS training of educators supporting K-2nd grade students and student outcomes in this grade band. This is the primary focus of this report but other elementary grades are included where applicable.

The first aspect of the research study was to complete a comprehensive literature review. The purpose of this comprehensive review was to summarize and interpret the current body of literature related to the

utilization, implementation, and impact of LETRS training. This literature review provided information and background for the formative and summative evaluation of LETRS across the five identified school districts in MESD and supported the contextualization of findings in this report. To increase relevance and applicability to the five districts included in this study, this review focused to the extent possible on literature produced in the past decade and involving schools in urban locations. Where available, this review highlighted the findings and conclusions drawn from peer-reviewed empirical studies. A copy of this literature review can be found in Appendix A of this report.

## Methods

### Educator Fall and Spring Survey

A survey was conducted with educators from each district who had completed any part of the LETRS training. The survey was administered at two timepoints (Fall 2022 [N=139]; Spring 2023 [N=187]) to shed light on educator experiences and perceptions as they progressed through the LETRS program. In the Fall of 2022, 139 educators who met the study criteria<sup>1</sup> participated in this survey. When the survey was readministered in the Spring of 2023, 187 educators who met the study criteria responded. Note that survey participants were allowed to skip questions, and therefore the number of respondents represented in the findings throughout this report vary by item.

Of the 139 educators who responded to the survey in the Fall, the largest proportion worked within Reynolds School District (29.5%), followed closely by PPS (28.8%). In the Spring, PPS educators (45.5%) were the largest group of respondents. Table 1 displays the breakdown of educator survey participation by district at each timepoint.

*Table 1. Educator Survey - School District*

District	Fall Survey (N=139)	Spring Survey (N=187)
Centennial SD	16.6%	10.2%
David Douglas SD	20.9%	15.0%
Parkrose SD	4.3%	3.7%
PPS	28.8%	45.5%
Reynolds SD	29.5%	25.7%

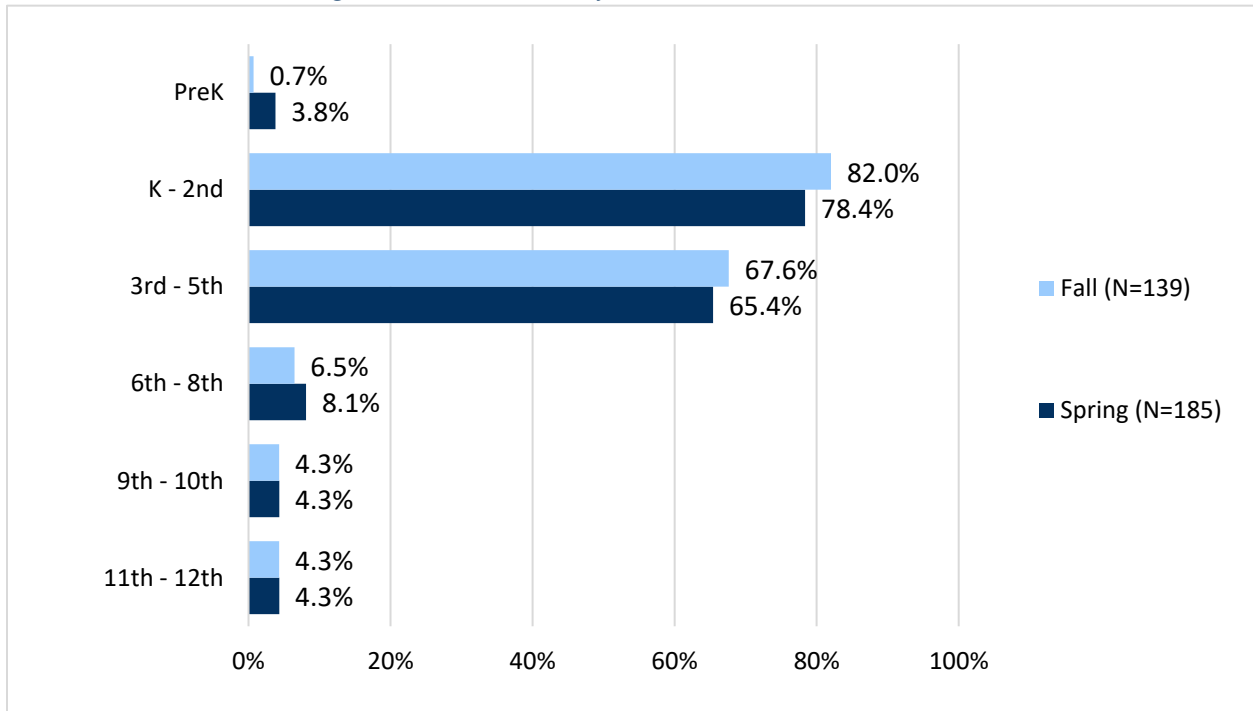
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<sup>1</sup> Only survey responses from educators who worked with students in the kindergarten through fifth grade range and had participated in any LETRS training were included in this aspect of the study.



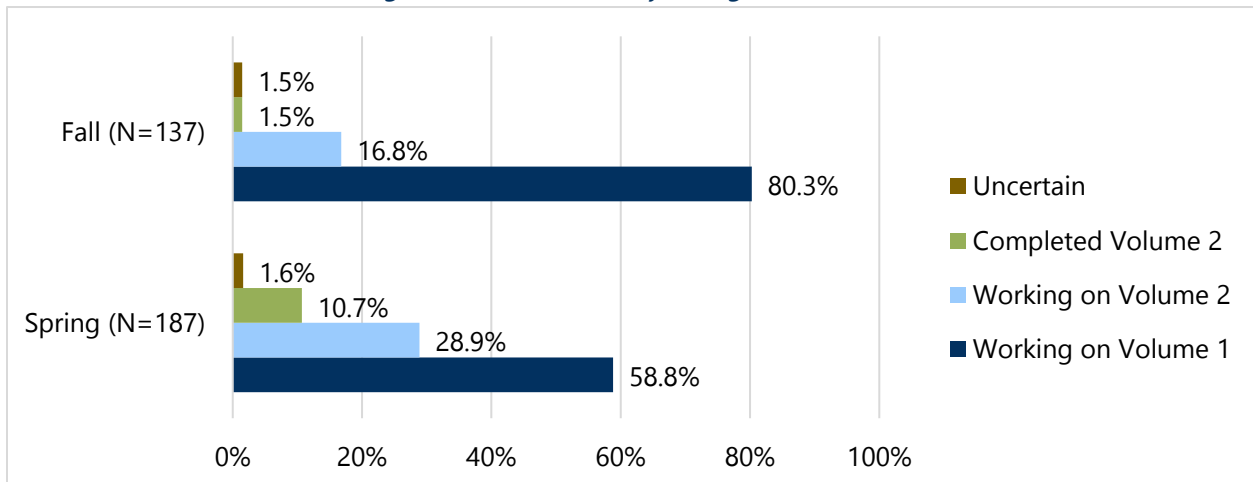
All educators included in this study worked with students in the kindergarten through fifth grade range. Many educators worked with students in multiple grade levels, including some who worked with middle and high school students in addition to elementary students. At both survey timepoints (Fall 2022 and Spring 2023), the highest majority of educators were focused on students in the kindergarten through second grade level. Nearly half of the educators who responded to this item (at either timepoint) selected more than one of the grade level options listed in Figure 1.

Figure 1. Educator Survey - Grade Levels Worked With



As of the Spring of 2023, educators had made varying levels of progress in their LETRS training. While most educators were still working on LETRS Volume 1, more educators had progressed into or completed Volume 2 by Spring 2023 as shown in Figure 2.

Figure 2. Educator Survey - Progress in LETRS



## Supplemental Study Survey

In Spring 2023, a survey of PPS educators was administered to assess educators' knowledge and perceptions regarding teaching developing readers. Participants included LETRS trained teachers (N=150), and a control group of teachers without any LETRS training (N=111). More information on the methods used for this study is included in the supplemental study section, beginning on page 66.

## Focus Groups and Interviews

Twenty-six educators from across the five target school districts participated in focus groups or interviews conducted in the Spring of 2023. As Table 2 displays, most of these educators were classroom teachers (n=15), and the district with the most educator representation was PPS (n=13).

Table 2. Educator Focus Groups and Interviews - District and Role

District / Role	Participant Count
<b>Centennial</b> <i>Classroom Teacher (1)</i> <i>Coach (2)</i> <i>Speech-Language Pathologist (1)</i>	4
<b>David Douglas</b> <i>Classroom Teacher (3)</i> <i>Specialist/Interventionist (1)</i>	4
<b>Parkrose</b> <i>Classroom Teacher (2)</i> <i>Specialist/Interventionist (1)</i>	3
<b>PPS</b> <i>Classroom Teacher (7)</i> <i>Specialist/Interventionist (4)</i> <i>Coach (1)</i> <i>Speech-Language Pathologist (1)</i>	13
<b>Reynolds</b> <i>Classroom Teacher (2)</i>	2
<b>Grand Total</b>	<b>26</b>

Nine administrators representing four of the target school districts participated in interviews in the Summer of 2023 (see Table 3). Most of these administrators were principals (n=6) at schools implementing LETRS professional development. In order to protect their anonymity, the roles of the three non-principal interviewees are not shared in this report.



Table 3. Administrator Interviews - District and Role

District / Role	Participant Count
David Douglas <i>School Principal (1)</i>	1
Parkrose <i>School Principal (2)</i>	2
PPS <i>School Principal (2)</i> <i>Other Administrator (1)</i>	3
Reynolds <i>School Principal (1)</i> <i>Other Administrator (2)</i>	3
<b>Grand Total</b>	<b>9</b>

Finally, six district key points of contact were interviewed in the Spring of 2023, including two PPS representatives, and one representative from each of the four other districts.

**Lexia Participation and Pretest/Posttest Data**

The LETRS learning systems platform, Lexia, was used to track educators’ progress on LETRS training as well as their Pretest and Posttest scores. Across the five target Multnomah County school districts, the total number of LETRS licenses associated with this project was 1,094.

Table 4. District Licenses

District	Total Licenses
Centennial	53
David Douglas	64
Parkrose	28
PPS	631
Reynolds	318
<b>Grand Total</b>	<b>1,094</b>

**Student Assessment Data**

Districts provided student achievement data from the 2022-2023 school year to shed light on the potential early student outcome impacts of the LETRS training program in Multnomah County schools. Specifically, achievement was examined by analyzing data from district literacy screeners which varied by districts and included: DIBELS, Acadience, iReady reading, and STAR assessment data. Additional details regarding these assessments and the design of the study are included in the final section of this report focused on student achievement findings. Data were provided for students of LETRS trained teachers as well as a comparison sample of students of teachers who did not participate in the LETRS training. Only students in the kindergarten through fifth grade with assessment data available from both Fall 2022 and

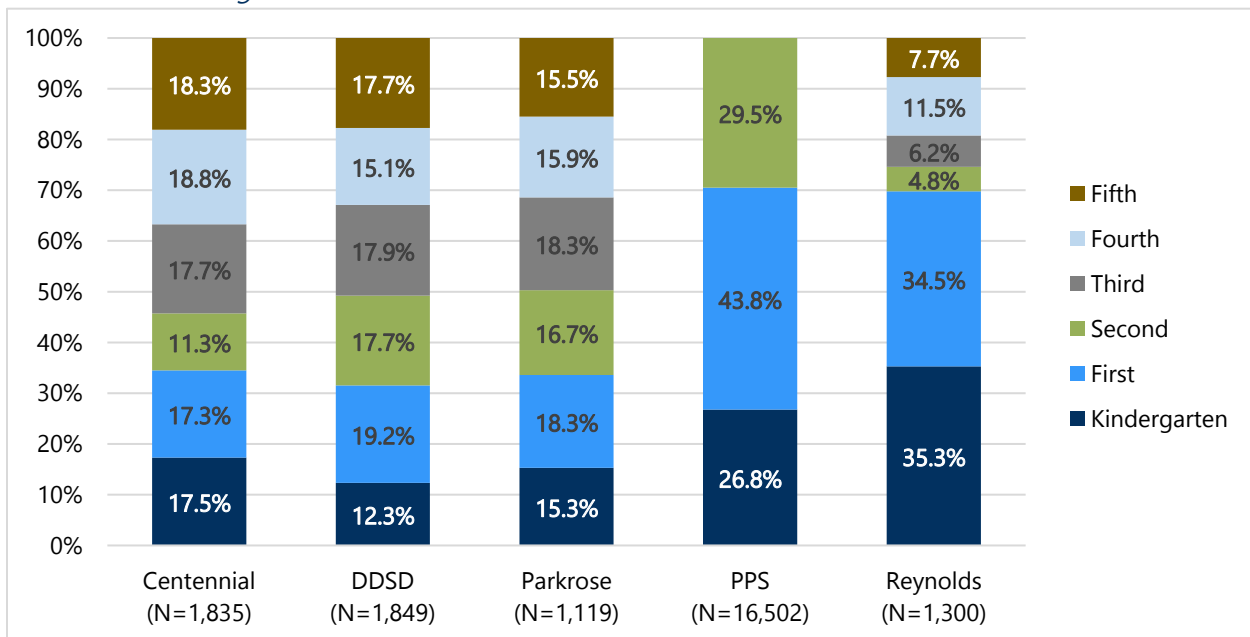
Spring 2023 timepoints were included in our analyses. Table 5 displays the number of students that are represented in the student achievement data treatment and comparison groups for each district.

*Table 5. Number of students with assessment data for each district*

District	Treatment	Comparison	Total
Centennial	389	1,446	1,835
David Douglas	362	1,487	1,849
Parkrose	252	867	1,119
PPS	2,195	14,307	16,502
Reynolds	1,051	249	1,300
<b>Grand Total</b>	<b>4,249</b>	<b>18,356</b>	<b>22,605</b>

The majority of student assessment data came from students in kindergarten and first grade for PPS and Reynolds, as shown in Figure 3, while the data were more evenly distributed across Centennial, DDS, and Parkrose.

*Figure 3. Grade level of students with assessment data for each district*



The tables to follow will display the demographic characteristics of the treatment groups students. The gender identity of treatment groups students represented in student assessment data is displayed in Table 6. Districts varied in the extent to which they provided information about the gender of students

included in student assessment data. Therefore, the percentages in the table below are based only on available data from each district (i.e., the number of students noted in the leftmost column of Table 6).

*Table 6. Student gender represented in assessment data for each district*

District	Male	Female	Non Binary
<b>Centennial</b> (N=407)	51.8%	48.2%	0.0%
<b>David Douglas</b> (N=362)	50.0%	46.1%	0.0%
<b>Parkrose</b> (N=252)	52.8%	46.8%	0.0%
<b>PPS</b> (N=2,195)	48.8%	50.9%	0.3%
<b>Reynolds</b> (N=189)	52.9%	47.1%	0%

Districts also varied in the extent to which the race/ethnicity of students was provided in combination with student assessment data. Table 7 displays the racial/ethnic representation of students included in each districts' student assessment data to the extent it was provided (see the number of students noted in the leftmost column).

*Table 7. Student racial/ethnic identity represented in assessment data for each district*

District	Asian	Black	Hispanic	Native American /Alaskan Native	Native Hawaiian/ Pacific Islander	White	Multiple
<b>Centennial</b> (N=2,051)	14.4%	8.2%	28.8%	0.5%	2.8%	37.3%	8.0%
<b>David Douglas</b> (N=1,849)	13.6%	12.2%	25.8%	0.5%	2.5%	30.6%	9.4%
<b>Parkrose</b> (N=252)	11.5%	19.8%	27.8%	1.6%	2.8%	51.2%	13.1
<b>PPS</b> (N=2,195)	13.0%	9.9%	15.9%	0.8%	1.4%	44.9%	14.1%
<b>Reynolds</b> (N=188)	3.2%	3.7%	56.4%	0.5%	1.1%	28.2%	6.9%

## Findings

The findings and discussion sections below are organized by the key research questions determined at the onset of this study. The first section of research questions focuses on the process districts used to implement LETRS, and the remaining five sections focus on the five levels of Guskey's<sup>2</sup> model for evaluating professional learning programs: Participants' Reactions (Level 1); Participants' Learning (Level 2); Organizational Support and Change (Level 3); Participants' Use of New Knowledge and Skills (Level 4); and Student Learning Outcomes (Level 5). Next, findings are presented from the supplemental study of

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<sup>2</sup> Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin.

teacher knowledge and beliefs. This report concludes with a summary section highlighting key findings and evaluation insights.

## Implementation and Context

### Which educators received LETRS training?

According to both the Fall and the Spring surveys, the majority of the educators across all five districts who had begun or completed their LETRS training were classroom teachers. Educators who selected the “Other” option for their role included English language development teachers, speech language pathologists, special education teachers, reading interventionists, Title I teachers, an occupational therapist, and a school psychologist.

*Table 8. Educator Survey - Role*

Role	Fall Survey (N=139)	Spring Survey (N=187)
Classroom Teacher	60.4%	66.8%
Instructional Specialist	13.0%	12.3%
TOSA	8.6%	2.7%
Coach	5.8%	7.5%
Specialist	2.2%	1.1%
Principal	0.7%	1.1%
Other Administrator	0.7%	1.1%
Other role than listed here	8.6%	7.0%

Interview and focus group participants confirmed the survey findings with participants across the districts representing a range of positions, including classroom teachers, virtual teachers, instructional coaches, speech-language pathology specialists, and administrators. Of the administrators who participated in interviews, the majority had participated in introductory LETRS training specific to administrators. Points of contact interviewees from PPS and Reynolds mentioned that they had ELD and SPED teachers involved, Centennial noted that learning specialists and coaches participated, and DDS added that coaches participated in their district.

Across all districts, the majority (86.6%) of educators who had begun or completed their LETRS training by Spring of 2023 shared that the highest degree or level of school they had completed was a master’s degree (see Table 9). The eight educators whose highest degree was not a master’s or a bachelor’s degree indicated that they held doctorate degrees, professional degrees, and high school diplomas (or the equivalent).

Table 9. Highest Degree Earned

Degree Type	Participant Count
Master's degree	161
Bachelor's degree	17
Other	8
<b>Grand Total</b>	<b>186</b>

Almost all educators (94.0%) surveyed at the Spring timepoint had earned a college degree that was specific to the field of education. Just over half of those educators had attended college within the last ten years (50.8%), while about a third (33.9%) had most recently attended college between eleven and twenty years ago (see Table 10).

Table 10. Most Recent College Attendance

Year Range	Participant Count
2013 - 2023	93
2003 - 2012	62
1993 - 2002	24
1983 - 1992	4
<b>Grand Total</b>	<b>183</b>

According to points of contact interviewees, a majority of those involved in LETRS were kindergarten through fifth grade teachers. Districts also typically had a few middle school and high school teachers involved as well as a couple of administrators.

Survey respondents shared why they decided to participate in LETRS training. At both the Spring and Fall timepoints, respondents across all districts most commonly indicated they became involved in LETRS to enhance knowledge of and develop foundational skills in reading instruction, to meet students' needs/better equip students to learn to read, to support readers who need extra support, and to understand the science of reading. Further, interviewees noted that some educators became involved in LETRS after they heard positive reactions from their colleagues who participated early in implementation.

## To what extent did participating educators complete all components of the LETRS program?

As of June 2023, across all five districts nearly ninety percent (89.1%) of licensed educators had completed Volume 1 of the LETRS training (as indicated by having taken the Volume 1 Posttest). The district with the highest LETRS completion rate (indicated by having taken the Volume 2 Posttest), was Reynolds (see Table 11).

*Table 11. District Volume 1 and Volume 2 Test Completion Rates (Lexia Data)*

District	Total Licenses	Took Vol. 1 Pretest	Took Vol. 1 Posttest	Took Vol. 2 Pretest	Took Vol. 2 Posttest
Centennial	53	49 (92.5%)	19 (35.8%)	10 (18.9%)	5 (9.4%)
David Douglas	64	60 (93.8%)	25 (39.1%)	9 (14.1%)	1 (1.6%)
Parkrose	28	23 (82.1%)	7 (25.0%)	7 (25.0%)	3 (10.7%)
PPS	631	545 (86.4%)	317 (50.2%)	185 (29.3%)	118 (18.7%)
Reynolds	318	298 (93.7%)	139 (43.7%)	101 (31.8%)	81 (25.5%)
<b>Grand Total</b>	<b>1,094</b>	<b>975 (89.1%)</b>	<b>507 (46.3%)</b>	<b>312 (28.5%)</b>	<b>208 (19.0%)</b>

The two-year time commitment required to complete the LETRS program is longer than most training programs and resulted in participants committing nights and weekends to complete the training, according to points of contact interviewees; the program time commitment led to attrition for some districts, which can be seen in Table 11 above. Teacher focus group participants added that educators valued the knowledge they could pull at any stage throughout their LETRS participation, despite varying levels of program completion.

## Which curricular resources and balanced assessment systems did districts use in conjunction with LETRS implementation?

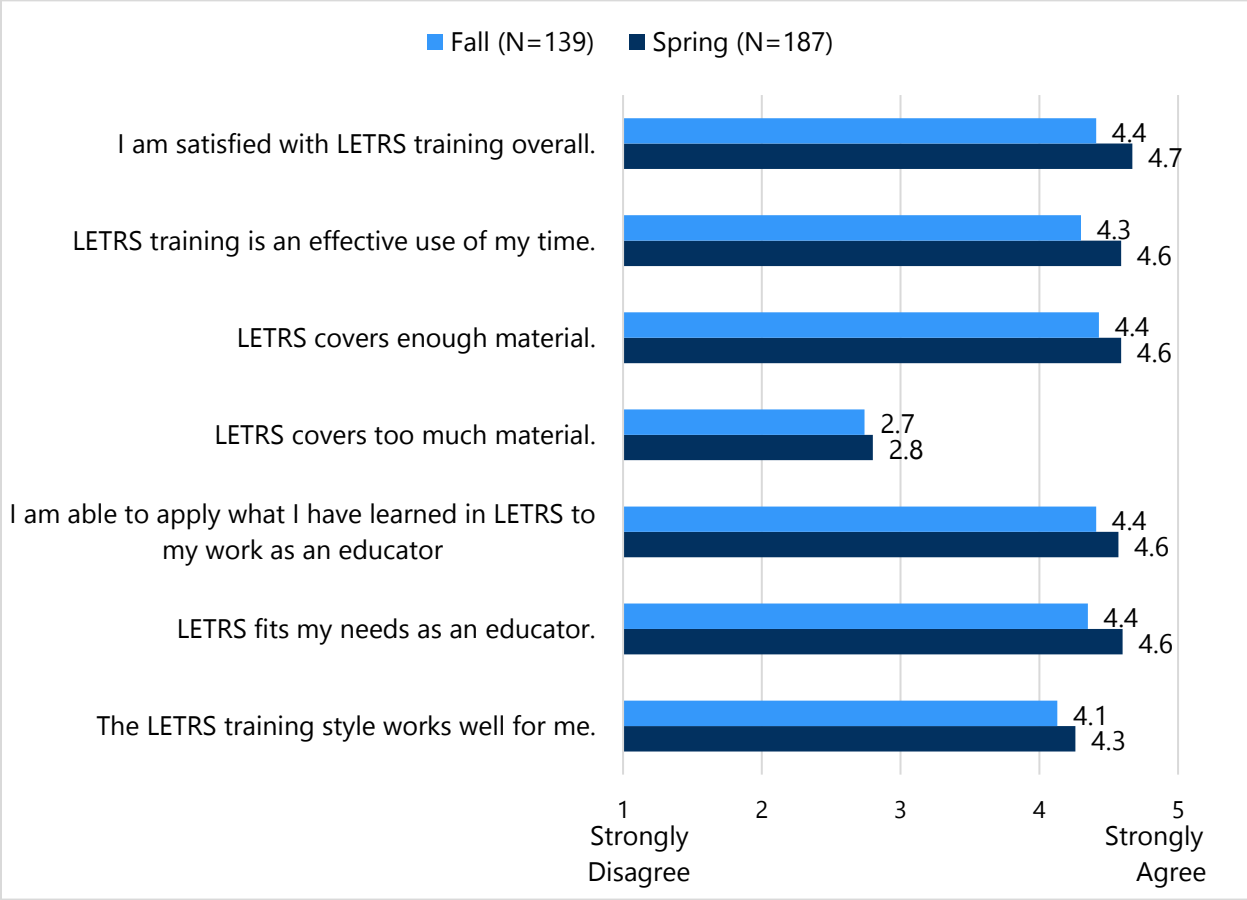
According to administrators, districts utilized a variety of curricular resources. Some districts utilized multiple curricula, with variation by grade. Curricula utilized included: 95 Percent Group, Heggerty Phonemic Awareness, Foundations, Geodes Reading Curriculum, Wit & Wisdom, Houghton Mifflin Harcourt (HMH) Curriculum, OpenCurriculum, Odell Education, ECRI, StudySync, Curriculum Associates iReady, and Amplicy. It is important to note that the 2022-2023 school year was a curriculum adoption year in Oregon and these were all newly adopted literacy curriculum. Regardless of the curriculum in place, points of contact indicated that LETRS was in alignment with these tools and many noted they were adopted because of this alignment. Some points of contact also mentioned the literacy screeners that their districts which included DIBELS, Acadience, STAR Reading, and iReady Reading.

# LEVEL 1: Participants' Reactions

## What were educators' reactions after participating in LETRS training? To what extent did educators like the training and find it useful?

Surveyed educators expressed positive perceptions regarding many aspects of their LETRS training, according to both the Fall and the Spring surveys. Figure 4 displays educators' average agreement ratings at each timepoint regarding a series of statements that are indicative of the extent to which educators liked the training and found it useful. All items were highly rated (with averages over 4 on a 5-point scale), with the exception of the statement "LETRS covers too much material," which received closer to a neutral level of agreement. Also, averages for all items were slightly higher at the Spring 2023 timepoint compared to the Fall 2022 timepoint.

Figure 4. Educator Reactions – Satisfaction with and Usefulness of LETRS<sup>3</sup>



<sup>3</sup> Due to participants skipping items, Ns vary slightly for the specific items listed in Figure 4. To save space and increase readability, the Ns reported in the legend of Figure 4 represent the highest number of responses to any of the listed item. This same format is used throughout this report whenever multiple items appear in a Figure together.



In focus groups and interviews, teachers, instructional coaches, and speech-language specialists provided feedback reinforcing the positive reactions demonstrated in survey findings. Many of these educators found that the content in the training allowed them to develop a better understanding of foundational principles regarding the science of reading and literacy and appreciated the quality and multiple modalities of interactive training materials. Some teachers noted that they could relate much of the training content to their current classroom curriculum due to the applicability of concepts and activities implemented throughout the LETRS units. Further, they appreciated the flexibility with which they could complete the LETRS training; however, some noted that they would have benefitted from additional opportunities to take training modules during contracted hours (e.g., district-funded staff development days) rather than relying on time after school or on weekends.



*"I appreciated being able to go at my own speed within reason and adhere to the [LETRS] schedule when I could. I thought that the presenters and online quizzes were well done and the Bridge2Practice was classroom applicable."*

*– PPS Teacher*

*"I am noticing that the foundational skills in our [school] curriculum are aligned to the phonics lessons that were in the LETRS training, so I am enjoying that."*

*– DDS Teacher*

*"I like how there are different instructional models and that it is engaging. The videos help break down the heavy workload and a lot of the materials are applicable and easy to do in the classroom."*

*– PPS Teacher*

Administrators shared positive feedback similar to that of educators. Their feedback reinforced that educators were developing new ways of thinking about reading instruction by learning about the science of reading. Further, points of contact described the LETRS PD as "useful" and "practical." An administrator from PPS echoed educator feedback that they could utilize the PD immediately: "[Educators] learn something new they didn't learn when they were in college. It's new learning but practical learning that they can then take and use in their classroom right away." Further, administrators observed that LETRS training tools were successful with students. A Centennial administrator made the additional point that understanding the theory has catalyzed teacher buy-in at their district.



*"I have heard lots of educators at various stages of their careers say that this has really helped them understand how students learn to read in ways that they never fully understood before and has helped them think about how to use their curricular resources more skillfully."*

*– PPS Administrator*

*"I think they found it incredibly helpful in terms of just really being able to develop an understanding of the why behind some of the things they were already doing."*

*– Parkrose SD Administrator*

*"I think they felt like it really got to the core of the basics of the brain, the science behind it, and how we learn to read. I think that was fascinating and teachers were genuinely curious about that."*

*– PPS Administrator*

Administrators also acknowledged the LETRS training workload, highlighting the intensity of the LETRS training as an overwhelming factor for some participants. Points of contact similarly noted that the PD is a lengthy time commitment with a lot of work required of participants. Points of contact interviewees further explained that the time requirement led to attrition of participants in DDS and PPS.

Across all districts, surveyed educators discussing what they liked most about the training confirmed they appreciated the research-based, science of reading content and the content's applicability. Educators also emphasized the usefulness of the multi-modal, self-paced training format. Overall, educators' responses remained consistent from the Fall to the Spring survey. In the Fall, however, they also highlighted the comprehensiveness of the training as an aspect of LETRS they liked. In the Spring, PPS educators shared appreciations for the support from the trainers and the training resources (e.g., the manual).



*"There are many modes to interact with and apply the content. The independent learning is complemented by interactive webinars, where we can ask questions and strengthen/deepen/extend what we have learned."*

*– PPS Educator*

*"I love the scope of the material. It is comprehensive and detailed, and very valuable."*

*– Parkrose Educator*

*"Skilled presenters and a really great resource book and activities."*

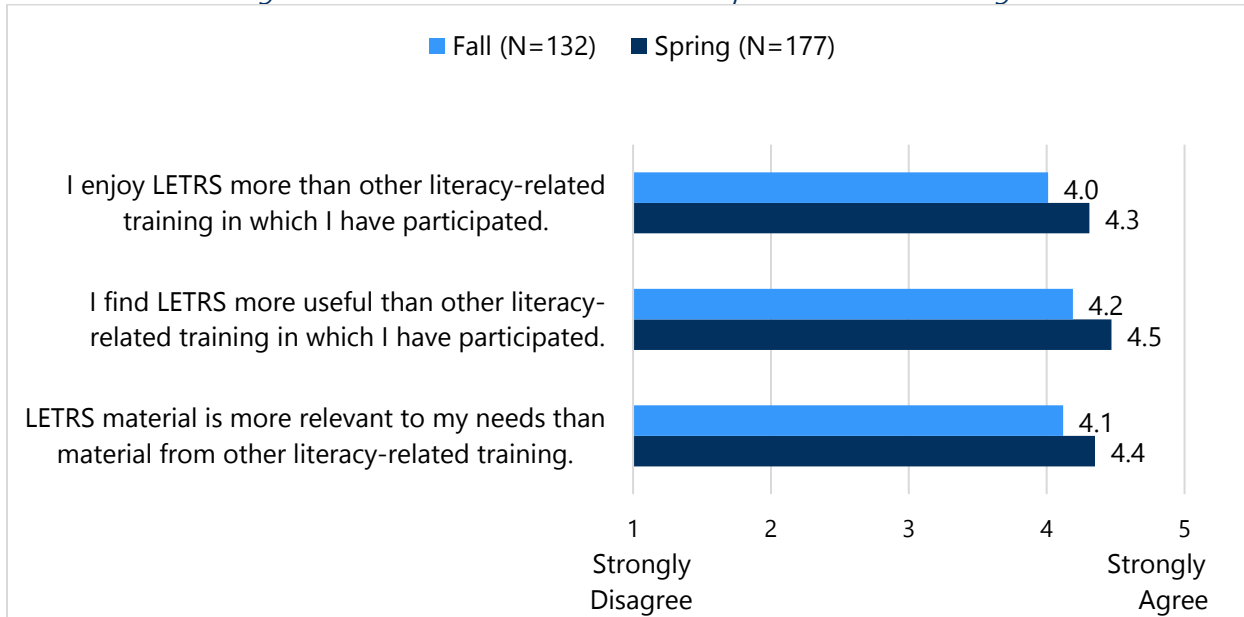
*– PPS Administrator*

## How did educators perceive enjoyment and utility of LETRS training differed from other literacy-related trainings?

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According to both Fall and Spring surveys, educators agreed that they not only enjoyed the LETRS training more but found it more useful and relevant compared to other literacy-related training. As shown in Figure 5, educators' agreement was slightly higher on average at the latter (Spring) timepoint.

Figure 5. Educator Reactions – LETRS Compared to Other Trainings



Similarly, administrators agreed that LETRS goes beyond typical reading curricula for educators by providing more in-depth knowledge around the science of reading, phonemic awareness, and brain development. Relatedly, administrators noted that the lengthy commitment required by LETRS training differs from other literacy-related trainings.



*"I think LETRS is providing a deeper knowledge of literacy that is not something we gain from basic curriculum training or instruction. In college we all had the big five reading instructional philosophy and understanding, but that was surface level when compared to the deeper understanding that LETRS provides."*

*– DDS Administrator*

*"They are enjoying what they are getting out of it, but it can be overwhelming to do your full-time job plus all of the time that it takes in order to fully grasp the LETRS training."*

*– Reynolds Administrator*

Educators in focus groups and interviews also felt the LETRS program was more comprehensive than other literacy training. They appreciated learning about student-centered learning experiences based on the foundational principles of the science of reading and noted that LETRS provided them with knowledge in these areas that went beyond prior training experiences. Further, some shared that the in-depth approach of LETRS training gave them the confidence to implement activities from the training in their classrooms; whereas, previous training opportunities had been time-constrained and less descriptive.



*"Over the years, a lot of the training opportunities that I have had have shown how to run small reading groups or how to use diagnostic tools to keep student records. In LETRS, however, it starts with understanding how kids learn to read and write, and then builds around how students access their learning. It is more student-centered."*

*– PPS Teacher*

*"The LETRS training is very intensive. The time that LETRS takes allows the program to have depth, whereas other professional development that we have had during district-directed training sessions do not have the time to go as deep."*

*– Parkrose Teacher*

*"The LETRS training wasn't too much to where it felt like busy work, but enough to where teachers felt confident to implement it in the classroom. I liked the Bridge2Practice in a sense that it encouraged me to instantly incorporate what I was learning in LETRS to my classroom."*

*– Parkrose Teacher*

When comparing the LETRS PD to other PD opportunities, a DDSD administrator echoed other data sources, stating that the LETRS training differed from others in that it was "far more in-depth." Administrators from Centennial, DDSD, and PPS offered the additional feedback that participants described LETRS training as the "best" or "most impactful" PD they had ever attended.



*"Time and time again, teachers are saying it's the most impactful professional learning course they have taken."*

*– DDSD Administrator*

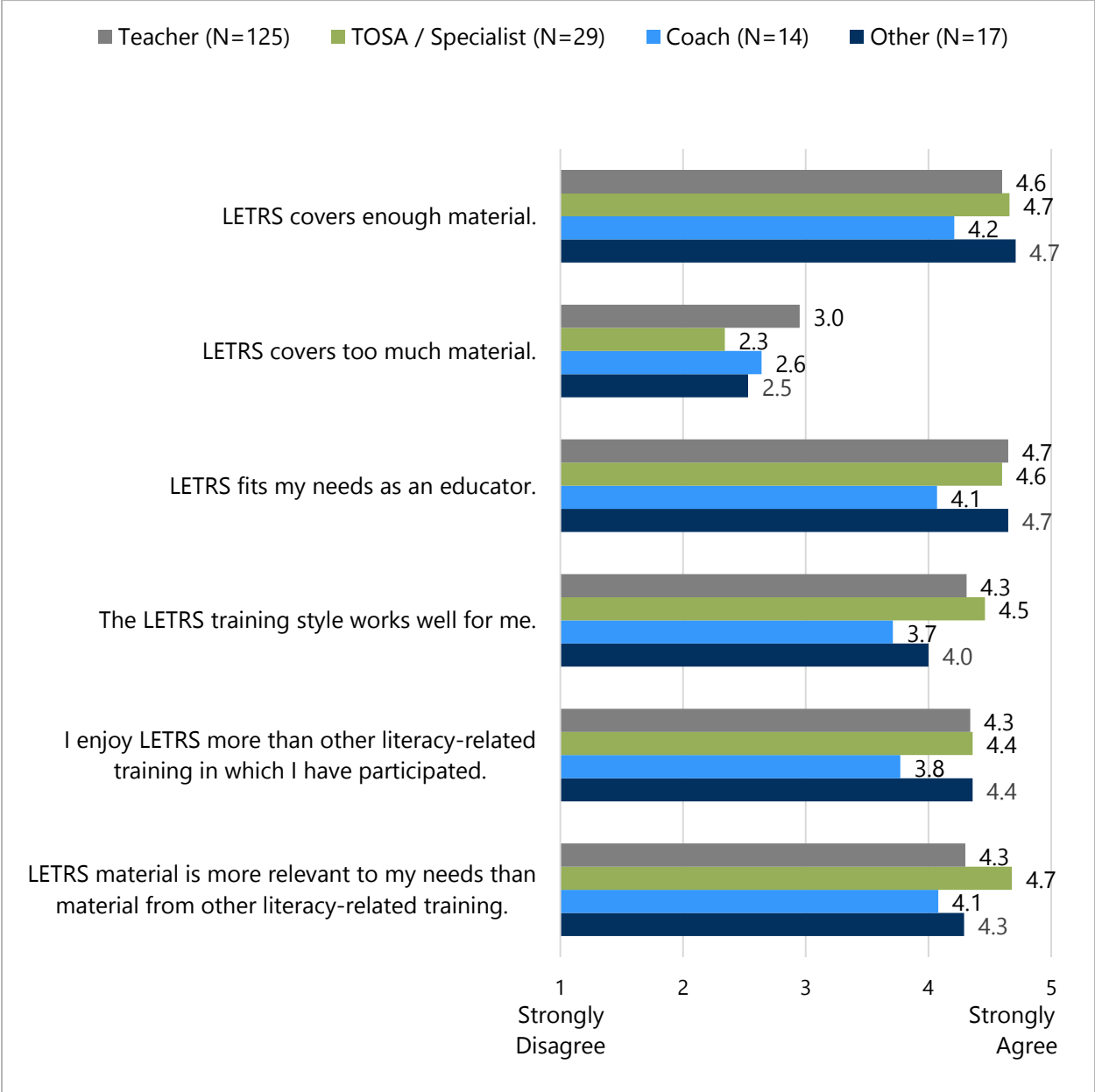
In contrast, two teachers from Reynolds School District shared experiences with a program, Success for All, which they felt was more intensive than the LETRS training. They indicated that, while they found the LETRS program to be similar, they preferred the Success for All program and its use of positive coaching, in which professionals from the program provided faculty with intentional monthly opportunities for mentorship and collaboration.

## Did reactions differ by educator type?

Educators in a variety of roles responded similarly to survey items regarding their reactions to the LETRS training. Because the Spring survey was administered more recently and at a time when educators were further along in their LETRS training, Spring survey data, rather than Fall survey data, was used to examine differences in responses based on role (note that combining data from the two timepoints was not possible because many of the same participants responded to both surveys). Also, due to small number of participants in certain roles, some roles were grouped together for the purposes of comparison, resulting in the following comparison categories: Teacher; TOSA / Specialist (including instructional specialist); Coach; and Other. The category labeled Other includes principals and other administrators, as well as participants who indicated on the survey that their role was something other than the options available.

Figure 6 displays the results of items that were found to have at least half a point (0.5 on a 5-point scale) of variation in responses based on educator type. Findings revealed that, compared to educators in other roles, coaches tended to have somewhat lower levels of agreement with statements indicative of how much they liked LETRS and found it useful. Additionally, compared to other educators, TOSAs and specialists expressed the strongest agreement that the LETRS training material was more relevant to their needs compared to material from other literacy-related training.

Figure 6. Variation in Educator Reactions by Role



## LEVEL 2: Participants’ Learning

There is clear evidence of participant learning in the Lexia pretest and posttest scores from each volume. LETRS participants from all school districts improved their Average Vol. 1 score and Average Vol. 2 score on the posttest when compared to the pretest.

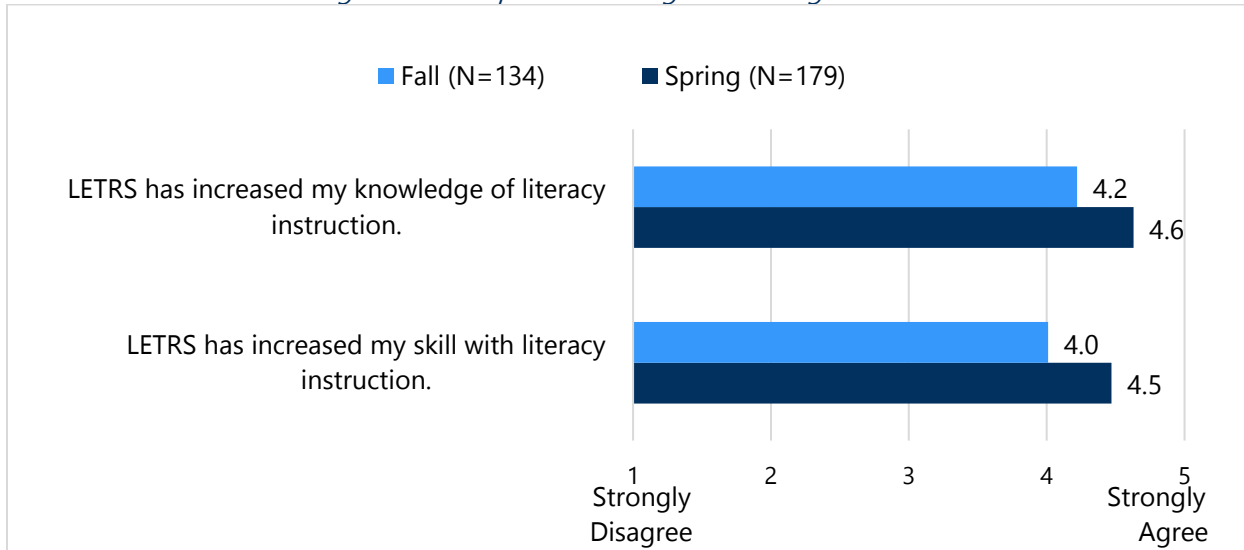
Table 12. Lexia pretest and posttest scores from each volume

District	Average Vol. 1 Pretest Score	Average Vol. 1 Posttest Score	Average Vol. 2 Pretest Score	Average Vol. 2 Posttest Score
Centennial	65% (n = 49)	95% (n = 19)	84% (n = 10)	96% (n = 5)
DDSD	64% (n = 60)	90% (n = 25)	79% (n = 9)	88% (n = 1)
Parkrose	66% (n = 23)	93% (n = 7)	79% (n = 7)	94% (n = 3)
PPS	63% (n = 545)	89% (n = 317)	80% (n = 185)	94% (n = 118)
Reynolds	56% (n = 298)	92% (n = 139)	77% (n = 101)	96% (n = 81)

### To what extent did educators perceive their knowledge and skills were impacted by participating in LETRS training?

Educators surveyed at both the Fall and the Spring timepoints expressed that LETRS had increased both their knowledge of and their skill with literacy instruction, as Figure 7 illustrates. Encouragingly, this sentiment was even stronger at the Spring timepoint compared to the Fall timepoint, indicating that as educators progressed through the LETRS training they felt more strongly that their knowledge and skills had increased.

Figure 7. Participants' Learning – Knowledge and Skill



Classroom teachers, reading specialists, and academic coaches who participated in the focus groups agreed that the LETRS program increased their application of literacy knowledge and skills in the classroom. Administrators added that LETRS participants' direct application to the classroom helped to reinforce their deep understanding and value gained from the LETRS training. For example, an administrator at DDS noted LETRS participants showed more confidence in their teaching and were making more adjustments to their instruction in the moment.



*"Now, I think more about the specific components of learning how to read. For example, I understand more about consonant and vowel articulation, which I am able to include in my lessons with students. My knowledge of morphology and vocabulary instruction has deepened; so much learning has happened for me."*

*– Parkrose Teacher*

*"The direct application piece of learning and then directly connecting to applying in the classroom has been really helpful."*

*– Parkrose Administrator*

Administrators also noted that teachers' deeper understanding of the science of reading has allowed them to identify gaps in resources and curriculum and fill in those gaps more effectively. One administrator noted that LETRS has helped teachers to break down the components of literacy to identify the specific needs of students to address gaps more effectively in their literacy skills development. Teachers, reading specialists, and academic coaches supported this sentiment, indicating that they felt as though they were better able to prioritize classroom activities to add to their curriculum following their participation in LETRS due to the program's evidence-based strategies.





*"LETRS has helped me look at the [reading intervention] programs that I am currently using to teach to see what their strengths are and be able to supplement their learning wherever there are holes."*

*– PPS Teacher*

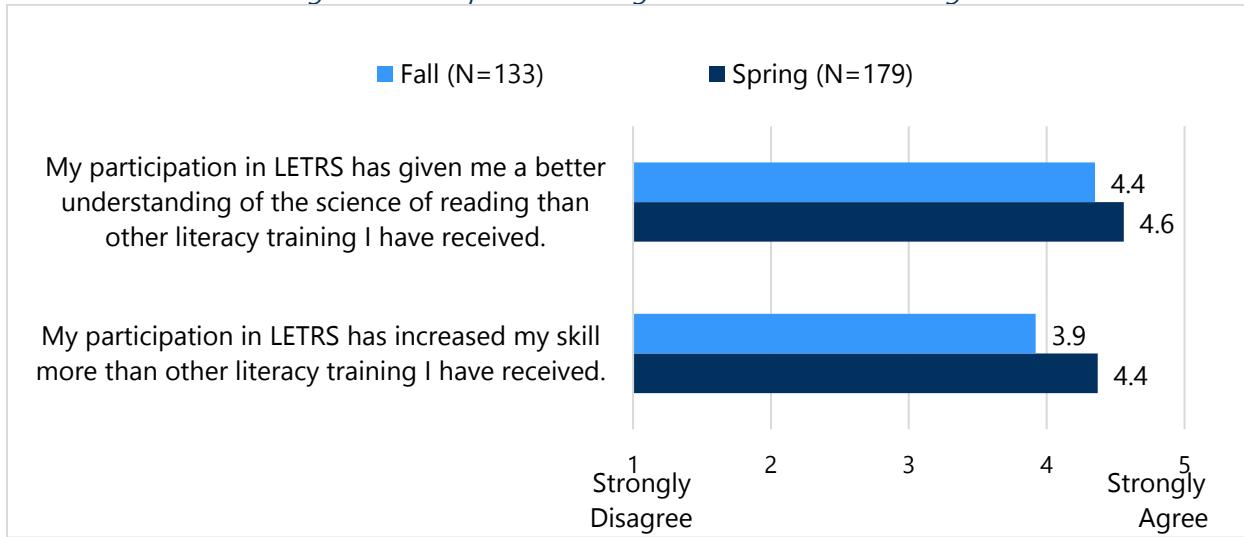
*"No materials are going to be perfect and have everything. Having that background knowledge now around the science of reading through LETRS has really helped teachers to develop that critical lens in terms of looking at how can we use those tools and fill in the gaps."*

*– Parkrose Administrator*

### How did educators perceive learning from LETRS training differed from other literacy-related trainings?

The thorough nature of the LETRS training combined with the focus on science of reading were the primary factors differentiating it from other literacy training. Educators think the LETRS training has given them a better understanding of the science of reading and had increased their skills more than other literacy-related training they had completed (see Figure 8). Again, this finding was more pronounced at the Spring timepoint compared to the Fall timepoint, suggesting that the further educators got in their LETRS training the more they felt that the LETRS training outperformed other trainings in these ways.

*Figure 8. Participants' Learning – LETRS vs. Other Trainings*



At both timepoints, educators across school districts noted that LETRS is more in-depth and comprehensive, is based on the science of reading and associated research on the brain, and is generally superior to other literacy-related trainings they had participated in previously. Administrators and points of contact also felt that LETRS was more thorough than other literacy-related trainings due to its focus on the science of literacy. At the Spring timepoint, educators from PPS noted the immediate applicability of LETRS training to their instruction and highlighted how LETRS has helped them work with student

subgroups (i.e., students with Dyslexia, struggling readers, and ELL students). At the Spring timepoint, educators from Reynolds also emphasized how LETRS teaches phonemic awareness which was also emphasized in teacher focus groups with all districts.

Through the focus groups, educators commonly shared that they either had not received literacy-related training opportunities prior to their participation in LETRS or that their prior training did not provide them with enough background knowledge on the science of literacy.



*"I had very little training before, and LETRS has been amazing because it seems very complete. I don't really have anything to compare it with because I didn't get any trainings and things like that, but it is very thorough, and I really enjoy it."*

*– DDS Teacher*

## LEVEL 3: Organizational Support and Change

### What supports did districts provide for educators engaging in LETRS training?

With regard to the type of support districts provided for LETRS training, a primary difference across districts was the compensation and protected time provided to complete the training. As shown in Table 13, participants from Centennial, PPS, and Reynolds received financial compensation for their participation in LETRS training, while Reynolds participants received dedicated time to focus on training and asynchronous LETRS homework through late school start time on Mondays and other days each month set aside for the work. Reynolds also attempted to offer two non-student contact days for training but faced obstacles when the planned PD fell on snow days. The findings in the table below were gathered via interviews and focus groups.

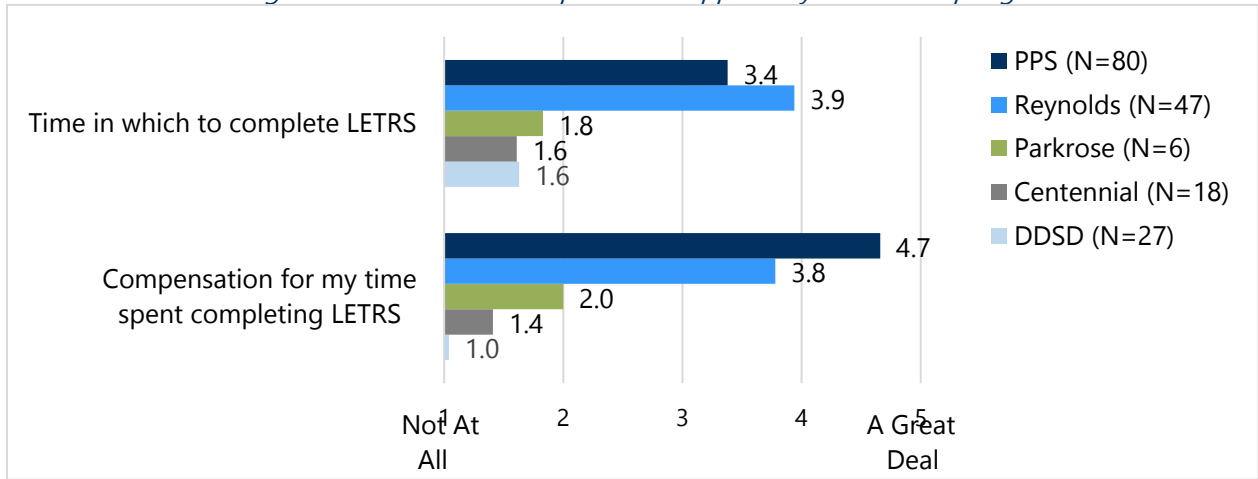
*Table 13. Compensation and protected time provided to complete LETRS training*

District	Received monetary compensation	Received protected time for LETRS training
Centennial	✓	
DDS		
Parkrose		
PPS	✓	
Reynolds	✓	✓

Figure 9 displays LETRS participants' perceptions reported on the Spring survey of the support they received from their district in the form of financial compensation and protected time. Educators in the PPS

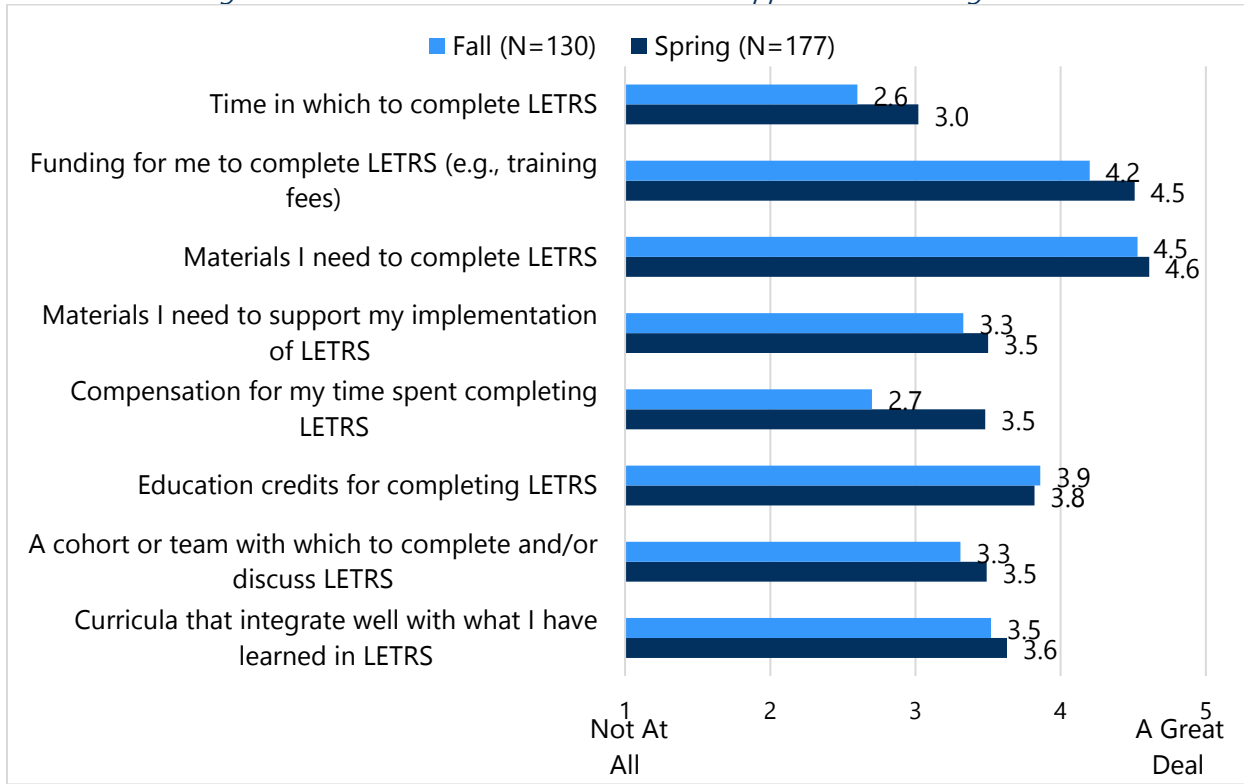
and the Reynolds school districts generally perceived more support from their districts related to time and compensation compared to educators in the other three districts, which can be expected given they are receiving this type of compensation.

*Figure 9. Variation in Perceptions of Supports by District in Spring*



Although there was a desire for additional support around time and compensation, Educators felt supported by their districts through funding and materials needed to complete their training. As shown in Figure 10, educators reported more support from districts in these (as well as other) areas at the Spring timepoint versus the Fall timepoint, potentially indicating that efforts by districts to support teachers grew stronger over the school year. At the Spring timepoint, educators from DDSD and Parkrose expressed appreciation for district-provided coaches and encouragement around participation.

Figure 10. Extent to which Districts Provided Supports Surrounding LETRS



Teacher focus group participants described additional supports that were helpful for making progress in LETRS. One teacher from PPS appreciated that they were able to easily access LETRS materials, as information was consolidated to one website. A few teachers across the five districts shared that they enjoyed LETRS Unit wrap-up sessions where they could discuss the training content with their colleagues. Administrators and points of contact added that participants from Centennial, DDSD, and Reynolds received support from coaches, which they noted was useful for implementation. Similarly, participants from PPS received support from TOSAs, while participants from DDSD received support from learning specialists.



*"I would say the building where LETRS was strongest is where we had solid coaching support because it helps people take risks. We had coaches modeling, as well as videoing themselves and teachers."*

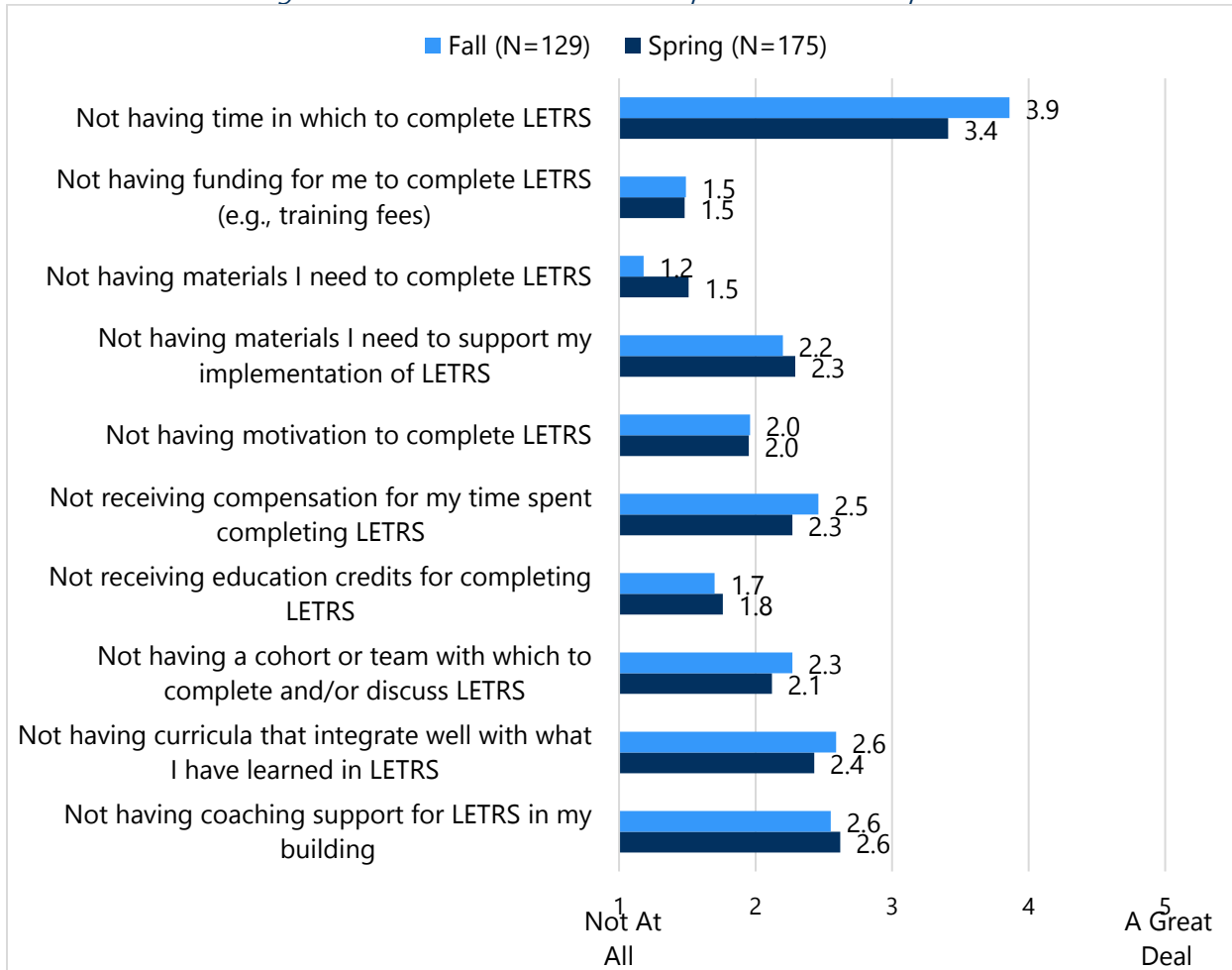
*– Centennial Administrator*

Along these lines, all district interviewed administrators agreed that they would like to continue to provide LETRS training to their educators along with a PLC, accountability group, or an accountability partner to increase endurance and application of the training. Finally, a DDSD administrator highlighted support from MESD, while a Centennial administrator spoke positively about support offered through learning walks.

## Under which conditions and/or supports did educators perceive they were best able to complete LETRS training? What barriers influenced educators' completion of LETRS training?

The most common barriers are aligned with the themes from the section above regarding the lack of time and compensation to complete the training. The most challenging aspect of completing the LETRS training was a shortage of time to complete the training; this finding was more pronounced at the Fall timepoint than at the Spring timepoint (see Figure 11).

Figure 11. Extent to which Barriers Impacted LETRS Completion



Open ended survey responses also referenced time as the greatest barrier to their participation, as did nearly all focus group and interview participants. Due to the length of the program, points of contact and teachers noted that participants had to commit non-contract hours such as mornings before school, evenings, and weekends to complete the program. Further, educators from PPS indicated that, prior to their first Saturday LETRS training session, they were only given one week's notice, and some were unable to attend. While teachers valued the level of rich content provided to them through the LETRS training, they commonly shared that they would prefer to keep their weekends free to maintain a healthy work-life balance. As such, teacher focus group participants indicated they would like more time during the

workday to complete the training. Points of contact added that participants from Parkrose, PPS, and Reynolds requested release time for LETRS but that a substitute shortage made this difficult to offer.

Points of contact added insight about time constraints, sharing that Centennial and DDS D were implementing new curriculum simultaneously with LETRS, which further limited available time for those participants. While PPS points of contact felt the training was too long for a learning opportunity outside of a university, DDS D and Reynolds points of contact questioned if the program could be shortened and still be as beneficial. One positive regarding the program length, according to the Reynolds and DDS D points of contacts, is that it generated excitement for the program as well as a sense of urgency.

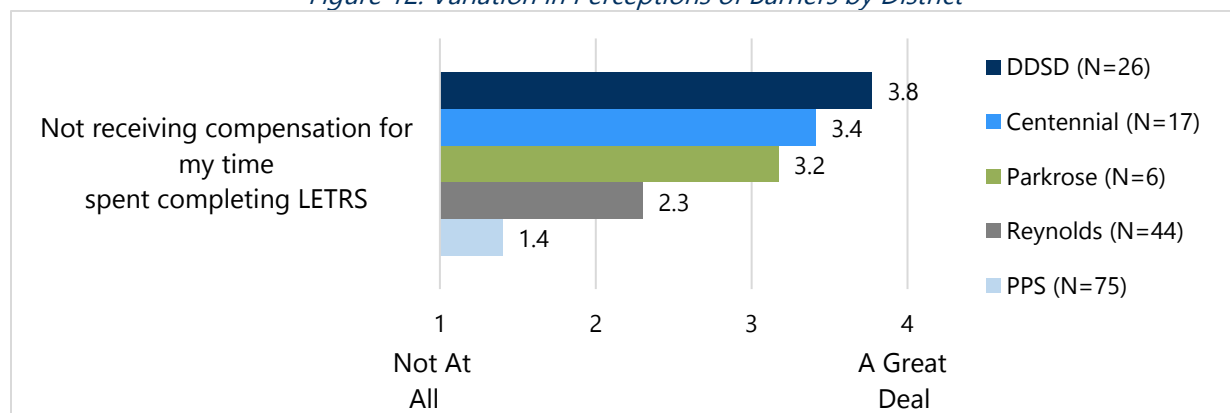
Because the time program time commitment led to attrition in some cases, districts addressed this barrier—in addition to those offering financial compensation and protected time—using a few methods. For example, while PPS supported participants to stay on track with pacing guides, Centennial offered reminders. Further, Reynolds offered LETRS as a fast-paced, two-year program (the traditional length) and a slower-paced, four-year program to address time constraints; however, some participants in the four-year track are now interested in finishing faster.



*“A lot of the teachers who are doing the slower pace [version of LETRS] struggle with completing it in the given timeline, because the district gives teachers one hour on Mondays to complete the training units. It is a real struggle to complete what they need to complete in the timeline that is wanted.” -Reynolds Teacher*

As discussed in the previous section, districts had inconsistent experiences with compensation for time to complete the training. Figure 12 shows that a lack of compensation for time to complete the training was a key barrier to completion for DDS D, Parkrose, and Centennial, the latter of which received some financial compensation.

Figure 12. Variation in Perceptions of Barriers by District



Although PPS and Reynolds received compensation to participate in LETRS, points of contact from their district indicated that these participants—along with those from Parkrose—expressed interest in receiving a pay raise for completing the program; however, to receive a wage increase participants need to take the program for college credit, which poses some obstacles. Additionally, a few teachers from Parkrose noted

financial challenges, as they paid for their LETRS program upfront and, at the time of the focus group, were unsure whether they would be provided with tuition reimbursement for their participation.



*"If the district had not provided the hourly pay, I would have liked to have done it, but would not have been able to commit to that many hours of unpaid work. I was paid, so I did it. One colleague expressed interest in completing Volume 2 of LETRS, but after hearing that the district would not pay for it, they decided to not do it. If people are not getting paid, they do not want to do it."*

*– PPS Teacher*

Some teachers and administrators also noted barriers with participating in the LETRS program on their own, as opposed to going through the program with a cohort of colleagues from their school or engaging in PLCs. A few educators shared feelings of isolation or lack of recognition from their administration, due to being the only faculty member to participate in the training. Some expressed interest toward increased opportunities for collaboration or coaching, such as designated meeting times for LETRS participants to discuss the training content and homework, or opportunities for literacy training professionals to provide mentorship to those involved in the training. Administrators also suggested it would be beneficial to meet collectively as a school to review progress data and create a "team effort" mindset around the implementation of LETRS knowledge and track progress around meeting literacy goals as a school.



*"I do not think that the district was able to dedicate time to see what I was learning about [from LETRS] or to create cohorts of people who were taking LETRS to collaborate. I think it would have been a richer experience if my administration had something where people who were doing LETRS program had some dedicated time to work together."*

*– PPS Teacher*

PPS did not provide a cohort format or in-person sessions for LETRS training. PPS Administrators noted in interviews that this as a barrier to engagement and completion of LETRS and indicated that an accountability group or partner may lead to a better experience, endurance, and application of training. Parkrose, Reynolds, and DDSD administrators agreed that LETRS participants who were able to participate in the training with others, benefitted from going through the training with group support.





*"I really do think it probably has worked best where people are in learning communities doing it together and where there's some kind of coaching or administrative support to support ongoing learning and bridge to practice."*

*– PPS Administrator*

*"Having conversation and being able to do the learning together and then apply it and come back together to talk about how it went; that type of thing was really beneficial. I think if you don't have a cohort or at least one other person that is doing it with you simultaneously, that could be a barrier."*

*– Parkrose Administrator*

*"I would definitely recommend LETRS so long as it's not in a vacuum. If teachers aren't talking about the learning and using some of that learning within another PLC or PD, I think that is a barrier."*

*– PPS Administrator*

Teachers from PPS and Reynolds also shared that they could benefit from more support with integrating LETRS into their classroom instruction, while administrators requested walkthrough tools to help them identify LETRS implementation within classrooms. Along these lines, administrators would like a way to monitor the progress of training participants to enable them to provide touchpoints to trainees throughout the year. A few teachers shared in focus groups that they experienced difficulties with implementing activities from the LETRS program, as they were not provided with the materials (e.g., magnetic letters, felt squares) required for them. Some participants suggested that, in the future, teachers could be provided with material starter kits to aid in the initial rollout of activities from LETRS.



*"Let's have a non-contact professional development day. Let's make sure that teachers have the support. Let's start ordering the magnetic tiles and make sure that teachers have access to the resources being referenced in the training."*

*– Reynolds Teacher*

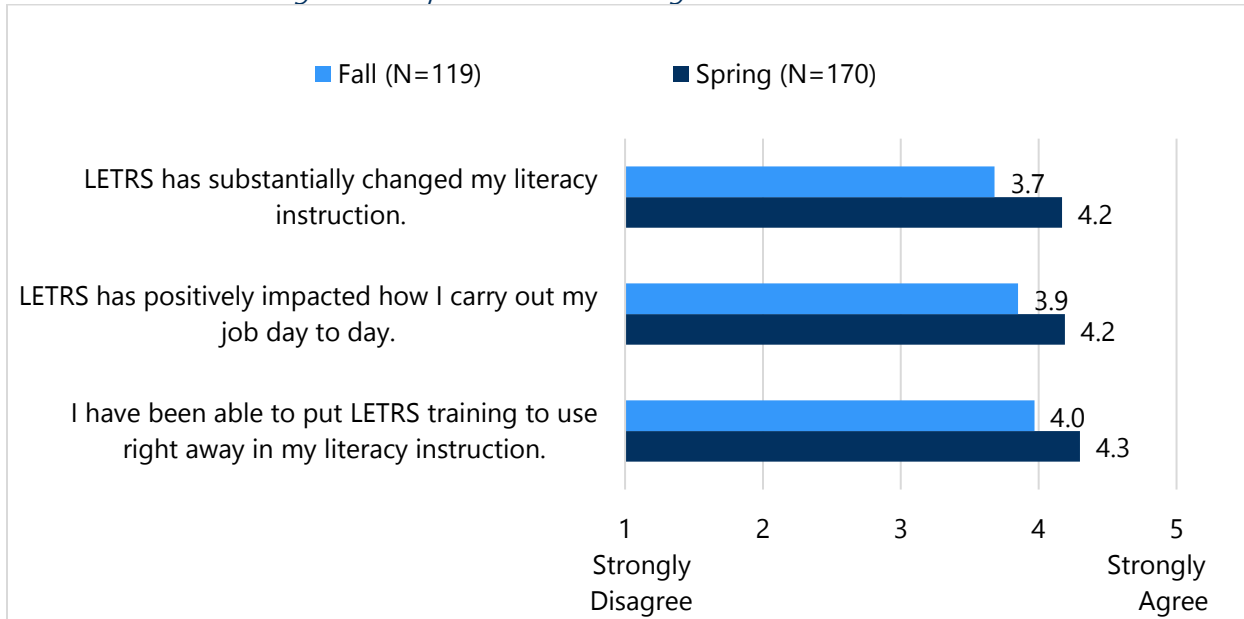
Finally, administrators requested a systematic way to showcase LETRS having a positive impact on students as a means to increase buy-in and interest in the training.

## **LEVEL 4: Use of New Knowledge and Skills**

### **To what extent did educators report changes in their instruction based on LETRS training?**

Overall, educators agreed that the LETRS training had changed their instructional practices and positively impacted how they carry out their job; they also agreed that they were able to put their LETRS training to use right away in their instructional practices (see Figure 13). Variation between Fall and Spring survey results suggests that as educators progressed through the LETRS training over the course of the 2022-2023 school year they felt more strongly that LETRS had impacted their literacy instruction.

Figure 13. Impact of LETRS training on Instructional Practices



In focus groups and interviews, educators across the five districts reported changes in the ways in which LETRS participants altered their curricular approach and mindset regarding teaching literacy. For example, one DDS administrator shared how classroom teachers have developed greater confidence in assisting students through evidence-based literacy teaching resources.



*"I do think I hear more confident language about all our kids deserving access to learn to read. I think LETRS is probably a part of that statement. Not that I think anyone would have ever said the opposite, but I think there were practices that demonstrated some of that inherent bias or predisposition. I feel there are more teachers who are saying "all kids can learn to read."*

– DDS Administrator

One administrator from Reynolds noted that teachers who participated in the LETRS training were moving toward an asset-based approach in their literacy instruction, as opposed to a deficit-based teaching approach, "With our instructional coaches, I could see a shift in their thinking through how they talked about the students. Rather than using deficit language, they would use more asset-based language and carry that into their coaching of teachers."

Administrators observed that LETRS trained teachers are able to identify the specific needs of individual students to determine what they can do more precisely to help. Prior to this deeper understanding, they were only noting the students' broad need and lacked clarity around how to address it. One DDS administrator observed that teachers with strong application of LETRS are seeing big improvements with their students as a result of having a deeper understanding of phonemic awareness to develop early literacy in students.



*“One teacher who really uses the curriculum and supplemental materials with intention and integrity, saw 83% of their first graders at or above typical growth for DIBELS. That is a 40% difference from their counterparts who are not in LETRS or don’t have a strong understanding of the science of reading.”*

*– DDS Administrator*

Classroom teachers expanded on this phenomenon, as focus group participants across the five districts expressed increased understanding and confidence in utilizing a well-developed and fine-tuned instructional toolbox to best understand the root of student learning challenges. One DDS teacher shared, “When it comes to decoding a word, I now encourage students to take their time to chunk the word and to not just guess what it is. Before LETRS, I would just say the word to them, which was not helpful.”

Further, classroom teachers who participated in focus groups noted increased confidence in prioritizing curricular resources that were evidence-based in their instruction. One indicated that they were forgoing any instructional practices that did not have any research or evidence behind them, due to the efficacy of evidence-based approaches found in LETRS.



*“I have a better sense of what needs to be prioritized within our curriculum. I have always felt that I was not prepared to teach reading, especially small group reading. I feel so much more prepared now that I have this background knowledge from LETRS.”*

*– DDS Teacher*

Finally, administrators from Centennial shared that LETRS participants started applying what they learned in staff meetings, trainings, and PLCs to help grow LETRS throughout the district.

## **What barriers did educators perceive in transferring learning from LETRS training to their educational practices?**

Educators shared barriers to transfer of learning from the LETRS training to their classroom instruction. Across the Fall and Spring, respondents from Centennial, DDS, PPS, and Reynolds expressed a lack of time for material and curriculum preparation, and classroom implementation. Further, they felt as though transferring knowledge was difficult, due to how much information is embedded within the training.

In focus groups and interviews, there were a few barriers that classroom teachers and reading specialists across the five districts experienced when transferring learning from the LETRS training to their instructional practices, including student buy-in, shifts in fundamental teaching principles, time spent incorporating LETRS into curriculum, and relevancy of LETRS to reading specialist roles. Those who shared feedback regarding student buy-in noted challenges with incorporating phonics principles in their lesson plans, as most students were reading or spelling at some level, despite having challenges with phonics. Since most students were able to read or spell, they often questioned why they were learning about foundations of literacy in their classes, yet teachers shared that students were more receptive to the LETRS inspired instructional approach following explanations of the science of reading.

One teacher from Centennial commented on shifting the fundamental teaching culture of encouraging students to move forward in their curriculum, regardless of whether that student felt ready to progress to a mastery approach that was encouraged in LETRS.



*“A huge challenge I see is the expectation of teaching to mastery is a huge fundamental shift for many teachers. There has been a culture where expectations [in the classroom] do not require students to obtain mastery of content before moving ahead in the curriculum. We tell the students that they don’t have to spell their words correctly or just to write something down, because we need to move on to the next chapter. That is education as a whole.”*

*-Centennial Teacher*

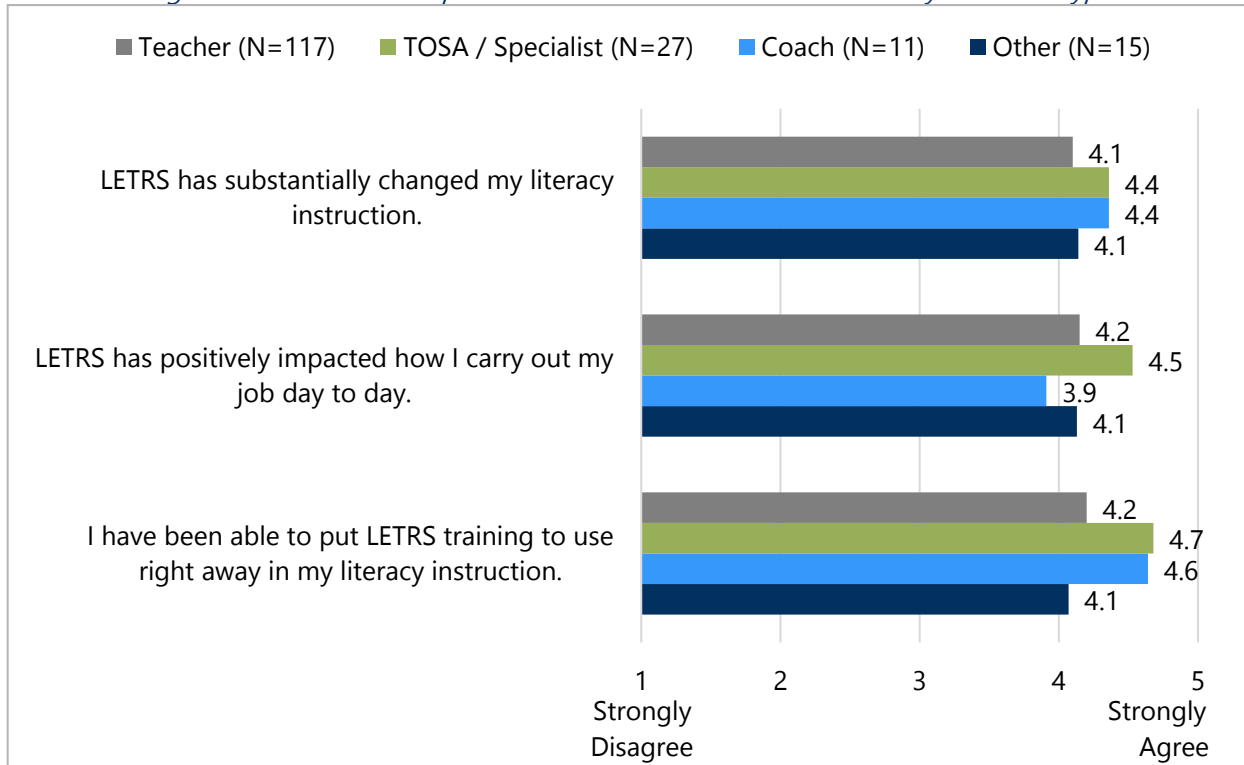
Some teachers and reading specialists expressed challenges with the time associated with incorporating LETRS into their curriculum. One teacher shared that they had incorporated a new literacy curriculum at their school in addition to their participation in LETRS, thus it was challenging to learn how to navigate the new curriculum while incorporating knowledge or activities found in LETRS. This barrier was addressed by a Parkrose administrator who expressed challenges with adopting a new curriculum and knowledge from LETRS simultaneously. Two reading specialists from PPS shared that they experienced barriers in applying their LETRS knowledge in their roles as they only worked with students on a short-term basis, as opposed to classroom teachers who worked with their students throughout most of their school day.

### **Did educators’ use of knowledge and skills from LETRS training differ by type of educator?**

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According to Spring survey results (displayed in Figure 14), educators in various roles reported high levels of agreement when it came to their perceptions that LETRS had impacted their literacy instruction and how they carry out their job. On average, TOSAs and specialists (including instructional specialists) expressed stronger agreement that LETRS had positively impacted how they carry out their day-to-day jobs. TOSAs and specialists as well as coaches expressed stronger agreement that they had been able to put their LETRS training to use right away, compared to teachers and other types of educators.

Figure 14. Variation in Impact of LETRS on Instructional Practices by Educator Type



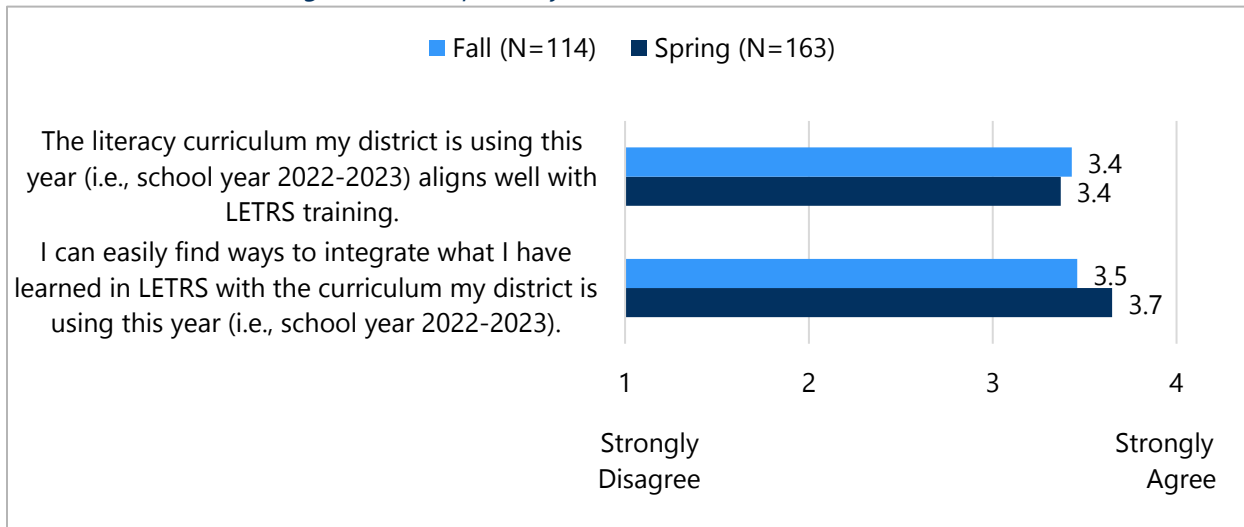
### Under which conditions and/or supports did educators perceive they were best able to transfer learning from LETRS training to their educational practices?

Spring survey respondents from Centennial provided open-ended feedback regarding resources and experiences that have helped them transfer their learning from LETRS into their classrooms, in which a variety of themes were noted. Some felt that their own efforts and differentiation skills were the most beneficial factors, while others highlighted the videos provided by the training and the training’s emphasis on foundational literacy principles, such as phonics. Coaching, collaboration, and learning walks also facilitated the transfer of learning from LETRS training to the classroom according to administrators from PPS, Centennial, DDSD, and Parkrose. A Reynolds administrator mentioned plans to offer PLCs in the upcoming school year to support transfer of learning in their district.

### How did educators perceive curricular resources and balanced assessment systems districts used in conjunction with LETRS implementation impacted their ability to transfer learning from LETRS training to their educational practices?

At both the Fall and the Spring timepoints, most educators shared that they agreed or strongly agreed that the literacy curriculum their district used during the 2022-2023 school year aligned well with the LETRS training. Educators also felt that they could easily find ways to integrate what they learned in LETRS with their district’s current curriculum (see Figure 15).

Figure 15. Compatibility of LETRS with Curricular Resources



There were mixed reactions expressed in the focus groups regarding the utilization of curricular resources and balanced assessment systems used in conjunction with LETRS. In DDS, two teachers shared conflicting commentary regarding the ECRI (Enhanced Core Reading Instruction) curriculum when paired with LETRS, in which one felt that they paired “beautifully” and the other felt as though ECRI was not as detailed as they were wanting.



*“I think LETRS has paired beautifully with what we are doing in ECRI. All I need to do is use the strategies I have been learning in LETRS to fine tune things in the curriculum. It has been awesome.”*

– DDS Teacher

Teachers who reported using the Foundations curriculum in conjunction with LETRS all shared positive feedback regarding the pairing, specifically as it related to the alignment of curriculum and course content from LETRS. Focus group participants from Reynolds who used the HMH curriculum reported alignment with LETRS as shared by one teacher: “We are doing HMH, which ties in well with LETRS. The way that our literacy curriculum is broken down has a section built for one classroom day of phonics and phonemic awareness and one day of writing.”

### How did educators perceive LETRS training impacted their ability to serve students from historically underserved student subgroups?

Educators were encouraged to reflect upon the ways in which their LETRS training impacted their ability to serve students from historically underserved groups. Educators from Parkrose, across the Fall and Spring, indicated that their training heightened their ability to identify and address skill gaps. In the Spring, respondents from DDS, Parkrose, PPS, and Reynolds shared that their instruction in general shaped their

experiences in addressing barriers relevant for students from historically underserved backgrounds. Aside from these observations, educators across all five districts noted that it was too soon to tell any other impacts as they related to historically underserved student subgroups.

Qualitative data highlighted numerous ways in which LETRS training impacted educators' ability to serve students from historically underserved subgroups. Administrators and teachers spoke to increased preparation, awareness, and empowerment to support students' literacy goals following LETRS participation. One administrator from Reynolds shared that the classrooms led by teachers who participated in LETRS showed greater literacy growth when compared to other classrooms.



*"We have 63% BIPOC students. We have more than 14 languages spoken. The teachers that really dug into LETRS had the highest growth in our school. I know there are many compounding factors around it, but all of them had good growth this year with their students."*  
– Parkrose Administrator

Classroom teachers and reading specialists across the five districts highlighted their increased confidence in using evidence-based strategies to target various literacy challenges experienced by a wide range of students. One teacher from Parkrose shared that increased access to and visibility of diagnostic tools provided by the LETRS program led to a better understanding of students' academic needs and increased transparency for student academic achievement. They shared, "LETRS is very straightforward with assessments and for our families who want to know why their child is not reading. There is an equity piece to this, especially for families who have not been treated correctly by the school system. The assessments take away the ability to be subjective about a student. It shows the family where the student is and what they know." Further, a teacher from PPS noted that they were better able to determine which students should be referred to special education programs, as LETRS provided examples of skills that needed to be met at each grade level.



*"It has been helpful to identify which students need to be referred to special education. LETRS made it much easier to tell where each student's level of needs was when I had the necessary skills to assess."*  
– PPS Teacher

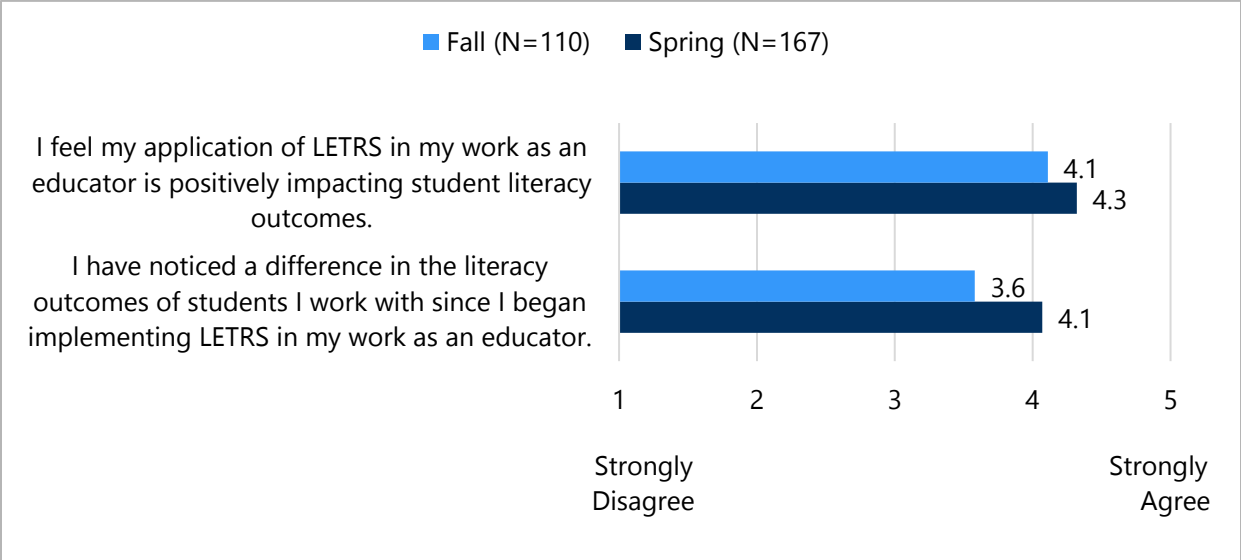
Qualitative data revealed a unique perspective, in which they noticed increased academic performance for ELD (English Language Development) students in LETRS classrooms, as teachers who participated in the training were provided with specific reading interventions necessary for ELD students.

# LEVEL 5: Student Learning Outcomes

## To what extent did educators perceive that student outcomes were impacted by LETRS training?

Educators perceive that their LETRS training has positively impacted the literacy outcomes of their students. This positive finding was especially pronounced at the Spring timepoint, when educators were further along in their LETRS training and when their students had spent more time receiving their instruction (see Figure 16).

Figure 16. Perceptions of LETRS Impact on Students' Literacy Outcomes



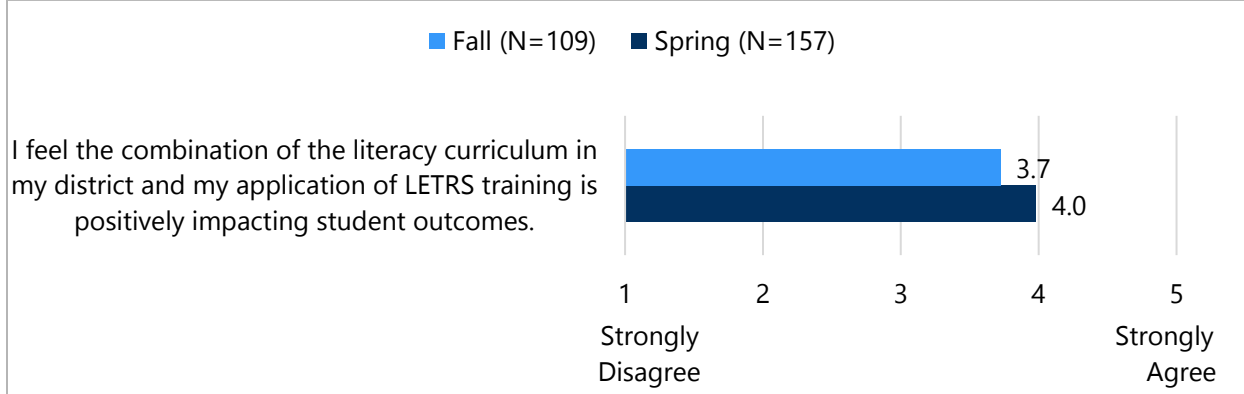
Teacher survey respondents from DDSD shared positive feedback regarding student outcomes that were impacted by their LETRS training. One teacher shared that student growth was “huge,” while another reported higher Spring benchmark scores in their classroom. A DDSD administrator shared that preliminary data showed that a group of teachers working as a team are showing particularly strong outcomes for students, surmising that collaboration is a factor in this success. Similarly, a Centennial administrator has seen positive shifts in outcomes, with improvements most prevalent where there were coaches. According to a PPS administrator, MAP data are showing improvements, while a Parkrose administrator generally noted success and growth for students as well.

## How did educators perceive curricular resources and balanced assessment systems districts used in conjunction with LETRS implementation impacted student outcomes from LETRS training?

Educators mostly agreed that the combination of their districts' literacy curriculum and their application of LETRS training was positively impacting student outcomes. As Figure 17 displays, educators reported slightly higher levels of agreement at the Spring timepoint compared to the Fall timepoint.



Figure 17. Impact of Curricular Resources and LETRS Training on Student Outcomes



Further, the following curricular resources and balanced assessment systems were shared by classroom teachers in focus groups and interviews:

- DIBELS
- Phonics screeners
- iReady reading diagnostic
- Magnetic Reading
- MAP Reading
- STAR assessment
- Informal assessment (e.g., encouraging students to read aloud to the educator)

Regarding the efficacy of curricular resources and balanced assessment systems in conjunction with the implementation of LETRS, there were mixed comments from educators in focus groups and interviews. Educators from DDS D shared that they found DIBELS to be an effective tool in progress monitoring, and two reading specialists from DDS D shared that the phonics screeners they used to inform instructional decisions were helpful. Across districts, a couple teachers expressed challenges with the iReady computer platform’s data retrieval programs. They shared that the data management systems were more difficult to interpret, due to a lack of graphs and difficulties deciphering whether students were understanding the digital content or pressing on random computer keys.

One teacher from Parkrose noted that their school had adopted a new program, Magnetic Reading, for benchmark testing, but expressed a preference for their previous system, Acadience. They shared that they preferred the data management system implemented in the Acadience system, as it was easier to understand student growth.



*"We use the iReady reading diagnostic and students do that on the computer three times a year. I don't love that because it is hard to know how valid the results are. For instance, younger students sometimes just click around on the computer and teachers are unable to know what students are responding to."*

*– Parkrose Teacher*

*"Time, I think. Just having the time to do LETRS-focused work and rolling it out in our classrooms."*

*– PPS Teacher*

## Despite the limited timeframe within which to monitor student outcomes, was there evidence of improved outcomes for students whose educators engaged in LETRS training?

Teacher focus group and interview participants who engaged in LETRS all shared positive feedback regarding student outcomes. Some noted that, at the time of the focus group or interview, they were anticipating continuous literacy growth among students in their classrooms. One teacher from DDSD highlighted student progress following their LETRS training, credited by increased district assessment scores and improvements in informal observations (e.g., students reading aloud to their teachers).



*"We are moving. We are still not quite at grade level, but it is a big job. It takes time and we are doing it. Phonics has an equity piece to it and some of my most vulnerable learners have been doing well with the strategies from LETRS."*

*– PPS Teacher*

One educator shared that, because of LETRS, they experienced a shift in mindset regarding the measurement of student progress. They shared,



*"I have had a shift in that I might not see a payoff in six weeks, which is when we do our interventions. Sometimes if teachers see no growth at the end of six weeks, we think that there is a problem. Now, I am seeing the payoff of things that I did last year with my students, and I feel like I have more of an understanding of waiting for students to mature."*

*– Parkrose Teacher*

# Evidence from Student Achievement Data

The following sub-sections discuss student achievement outcomes for each district. Because of differences in the types of assessment used, and in pursuit of the most meaningful data insights, it was determined that districts' findings should be presented separately. A series of logistic regressions were conducted to explore potential differences in student achievement outcomes between treatment (i.e., students with LETRS trained teachers) and comparison (i.e., students with non LETRS-trained teachers) groups. For most districts, these tests did not reveal statistically significant findings.

**For David Douglas School District, there was a significant effect of the LETRS training on student achievement for K-5 students. This significant finding was present when examining student achievement for English Language Learners and Historically Underserved Race/Ethnicities. Additional details regarding these promising findings are included the DDSD sections to follow.**

## A Note on the Use of Literacy Screeners for Evaluation Purposes

The data produced from the Literacy Screeners included in this section of the report are designed to help teachers identify children at risk for reading difficulties and determine the skills to target for instructional support. They are designed to be part of a feedback loop that operates within each classroom each year, serving as a tool for teachers to reevaluate their lesson plans and strategies. For this reason, assessments should be used as a descriptive tool rather than an evaluative tool. Since these screeners are the only assessment of early literacy skills, they are analyzed in this report for descriptive purposes, but we caution giving too much weight to the results.

## Testing for Intervention Effects in Education

It is often challenging to see the impact of a teacher professional development program on student achievement outcomes in education. With this in mind, we encourage you to consider the following as you read this section:

- ◆ As presented at the beginning of each districts' section, many teachers had not yet completed the LETRS training.
- ◆ In educational intervention research, it is extremely rare to find evidence of student achievement outcomes associated with teacher professional development in less than 2 years.
- ◆ 2022-23 was a literacy curriculum adoption year in Oregon and all districts in this study adopted curriculum that is aligned with the Science of Reading. Although teachers from the comparison groups in our study were not LETRS trained, they were using curriculum designed to support teaching to the science of reading.

# Centennial School District

Centennial School District used Acadience Reading, formerly DIBELS NEXT, and STAR Reading as its literacy screeners during the 2022-2023 school year. The impact of LETRS training on student achievement was assessed by examining Acadience and STAR data for students of LETRS trained teachers (treatment) compared to students with non-LETRS trained teachers (comparison). LETRS-trained teachers included any educator at Centennial who had started the training and could be at any stage. The table below shows the progress of Centennial educators and indicates that nearly three quarters of the 58 LETRS participants were on Volume 1 of the training.

*Table 14. Centennial LETRS Participants' Progress on Training*

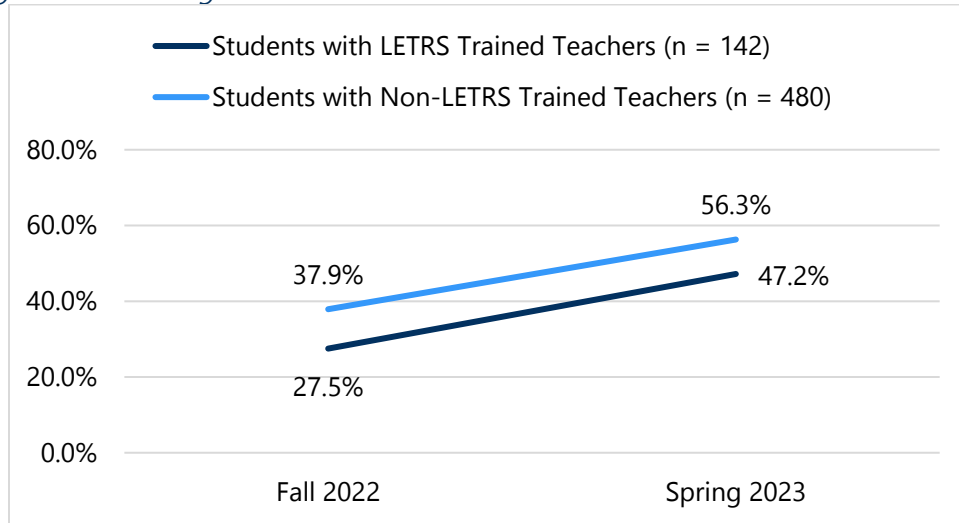
Progress	% (n)
On Volume 1	74.1% (n = 43)
On Volume 2	13.8% (n = 8)
Completed	12.1% (n = 7)

The Acadience assessment was completed by kindergarten and first grade students at Centennial. For this assessment, students' numeric scores were associated with four composite score categories: well below benchmark; below benchmark; at benchmark; and above benchmark. The percentage of students at or above benchmark on the Acadience Reading assessment were combined and compared at Fall and Spring timepoints for the two groups of students.

The STAR assessment was completed by third through fifth grade students at Centennial. Similarly, students could score in four categories on the STAR assessment: urgent intervention; intervention; on watch; and at/above benchmark. The percentage of students at/above benchmark on the STAR assessment are compared at Fall and Spring timepoints for the two groups of students as well.

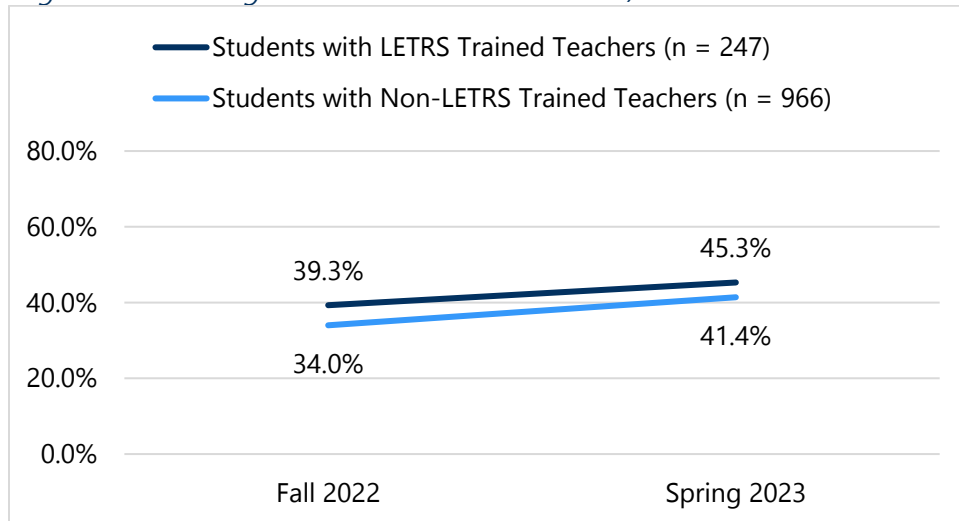
An analysis of Acadience and STAR assessment data did not provide evidence of an overall impact of LETRS training on student reading achievement in CSD. The figure below presents the percentage of K-2 Centennial students reading at or above grade level in the Fall and Spring. At both timepoints a higher percentage of K-2 students who did not have LETRS trained teachers scored at or above benchmark. (Figure 18).

Figure 18. Percentage of Centennial K-2 Students At or Above Benchmark on Acadience



Conversely, a higher percentage of 2-5 students with LETRS trained teachers scored at/above benchmark on the STAR assessment at both timepoints as shown in Figure 19.

Figure 19. Percentage of Centennial 2-5 Students At/Above Benchmark on STAR



When broken down by grade level, kindergarten and first grade students mirrored the larger K-2 trend with the comparison group showing a higher percentage of students reading at grade level or higher at both timepoints (See Figures 20 and 21).

Figure 20. Percentage of Centennial Kindergarten Students At or Above Benchmark on Acadience

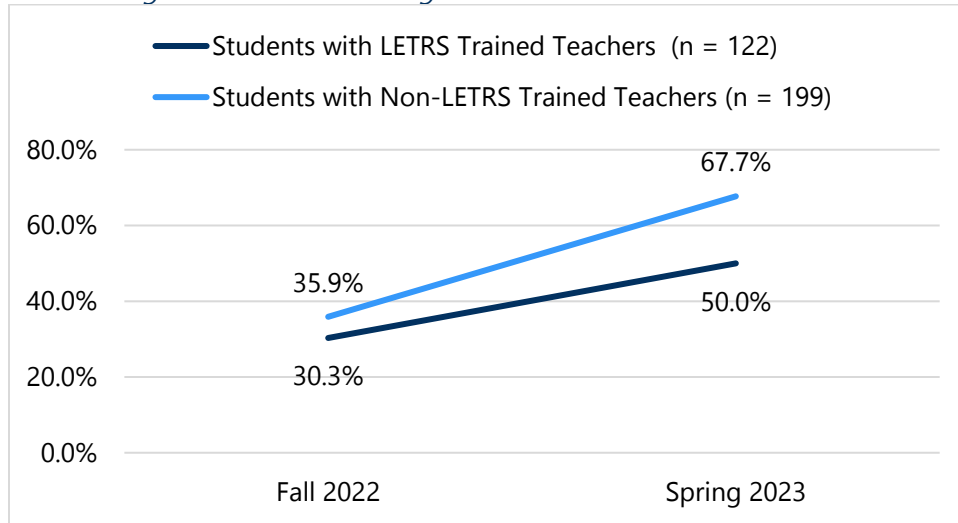
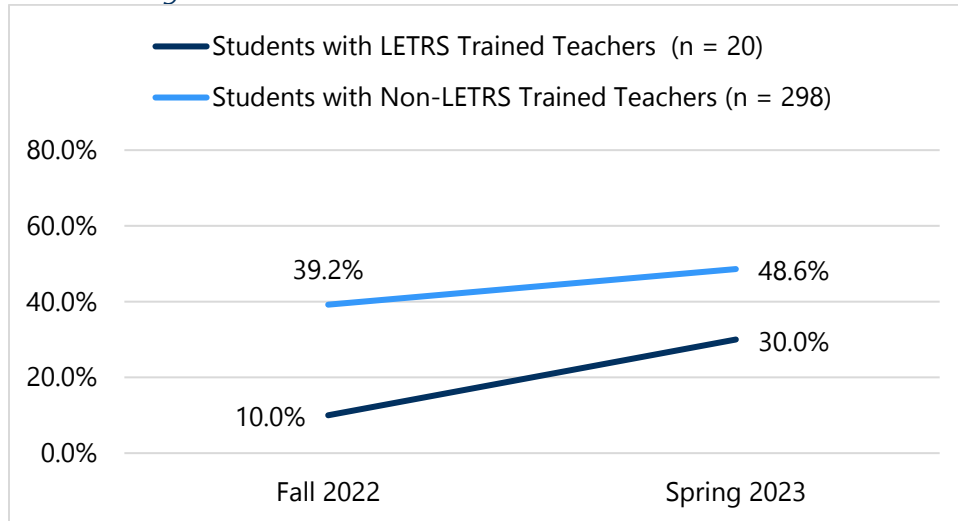


Figure 21. Percentage of Centennial 1st Grade Students At or Above Benchmark on Acadience



For second and third grade Centennial students, there was a slight increase from Fall to Spring in the number of students reading a grade level (Figure 22 and Figure 23).

Figure 22. Percentage of Centennial 2nd Grade Students At/Above Benchmark on STAR

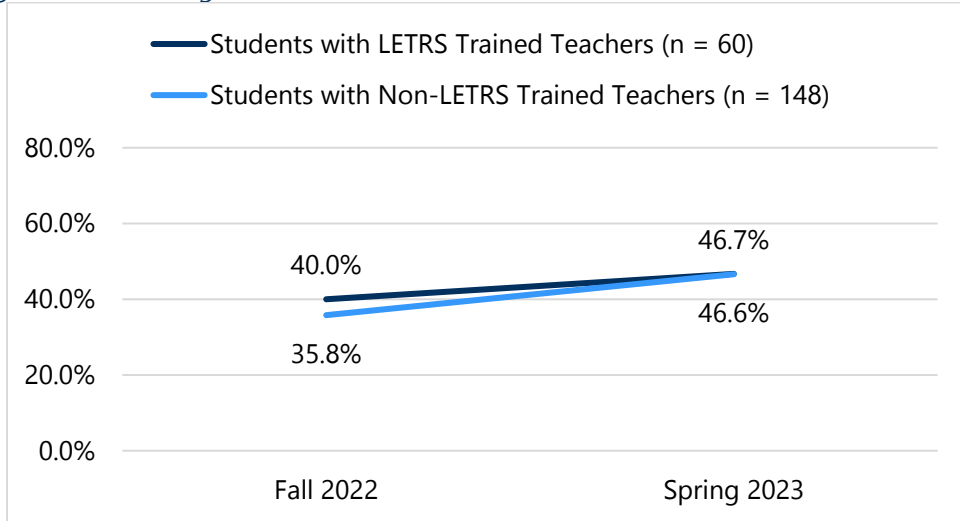
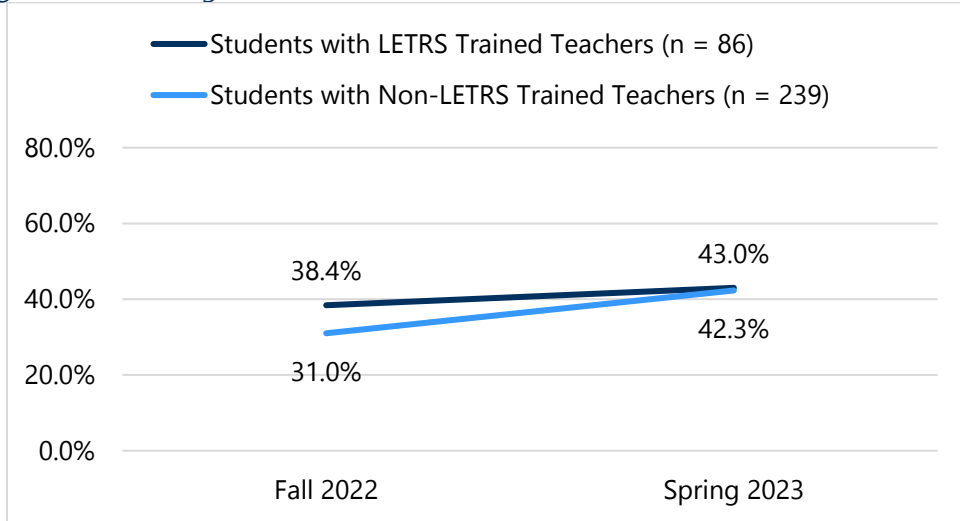


Figure 23. Percentage of Centennial 3rd Grade Students At/Above Benchmark on STAR



Fourth grade progress is presented below and shows that a higher number of students with LETRS trained teachers were at benchmark in the Fall and this continued into the Spring timepoint (Figure 24).

Figure 24. Percentage of Centennial 4th Grade Students At/Above Benchmark on STAR

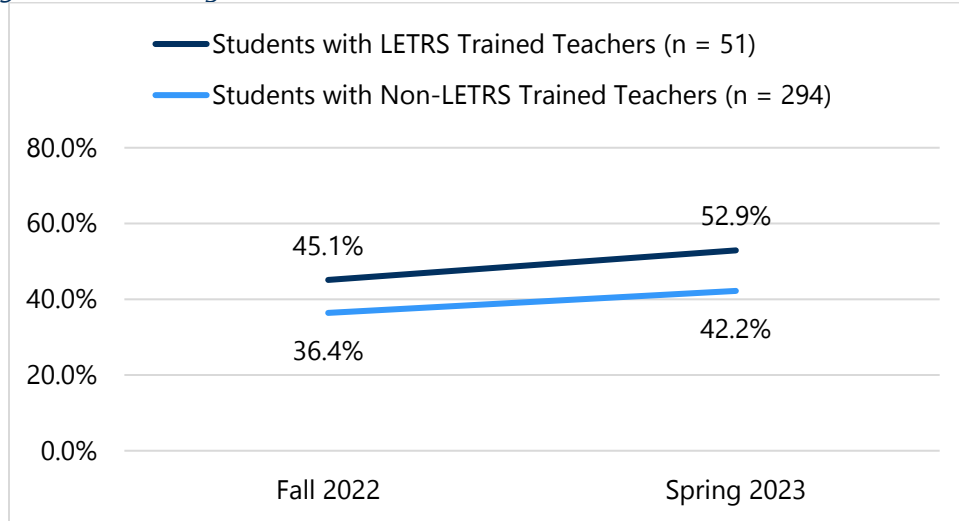
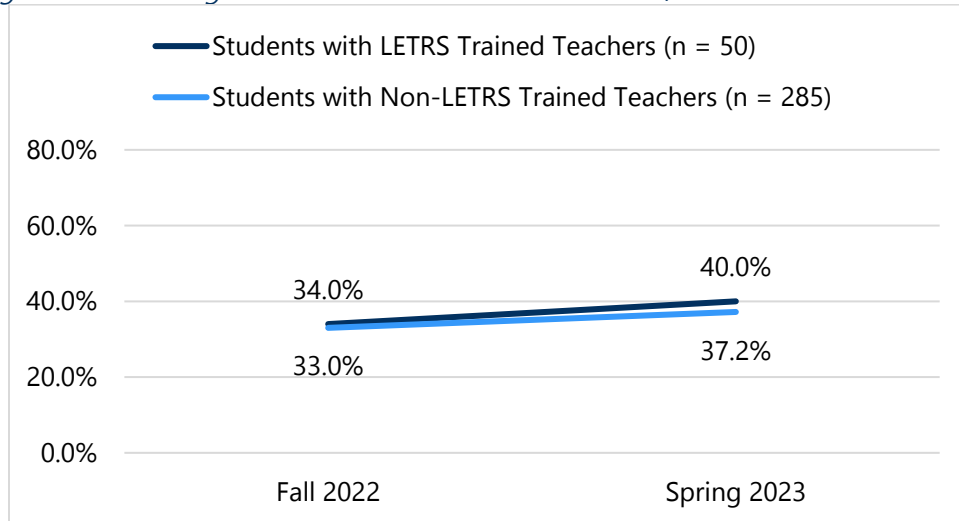


Figure 25 presents data from the STAR reading assessment and shows the rate of achieving a score of at/above benchmark on the STAR assessment was very similar at both timepoints regardless of whether students’ teachers were LETRS trained or not.

Figure 25. Percentage of Centennial 5th Grade Students At/Above Benchmark on STAR



## David Douglas School District

David Douglas School District used Acadience Reading, formerly DIBELS NEXT, as its primary literacy screener during the 2022-2023 school year. To examine the impact of LETRS training on student achievement, Acadience data were analyzed for students of LETRS trained teachers (treatment) compared to a group of students whose teacher did not participate in the LETRS training (comparison). LETRS-trained teachers included any educator at DDSD who had started the training and could be at any stage. The table below shows the progress of 64 DDSD educators and demonstrates that a large majority were on Volume 1 of the training.



Table 15. DDSD LETRS Participants' Progress on Training

Progress	% (n)
On Volume 1	85.9% (n = 55)
On Volume 2	12.5% (n = 8)
Completed	1.6% (n = 1)

Students' numeric scores were associated with four composite score categories: well below benchmark; below benchmark; at benchmark; and above benchmark. The percentage of students at or above benchmark on the Acadience Reading assessment were combined and compared at the two timepoints for the two groups of students.

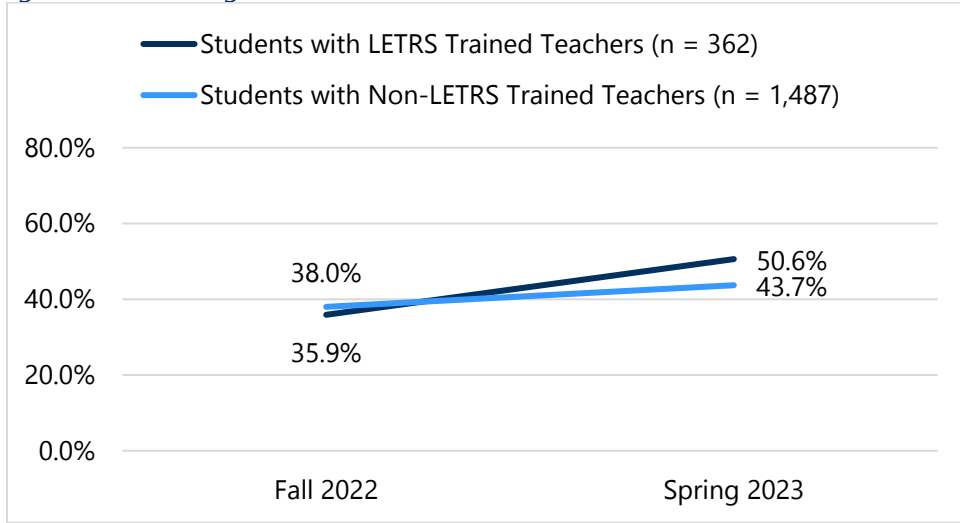
### Significant Achievement Results for DDSD

A series of logistic regressions were conducted to explore potential differences in Acadience scores between treatment (i.e., students with LETRS trained teachers) and comparison (i.e., students with non-LETRS-trained teachers) groups at Spring timepoints controlling for students' Fall Acadience scores. DDSD showed statistically significant findings for three of these analyses as detailed below:

- When considering grades K-5, students of LETRS trained teachers were **1.71 times more likely** to have a Spring reading composite score at or above benchmark compared to students of non-LETRS trained teachers.
- When considering ELL students in grades K-5, students of LETRS trained teachers were **2.67 times more likely** to have a Spring reading composite score at or above benchmark compared to ELL students of non-LETRS trained teachers.
- When considering Historically Underserved students in grade K-5, students of LETRS trained teachers were **1.51 times more likely** to have a Spring reading composite score at or above benchmark compared to HU students of non-LETRS trained teachers.

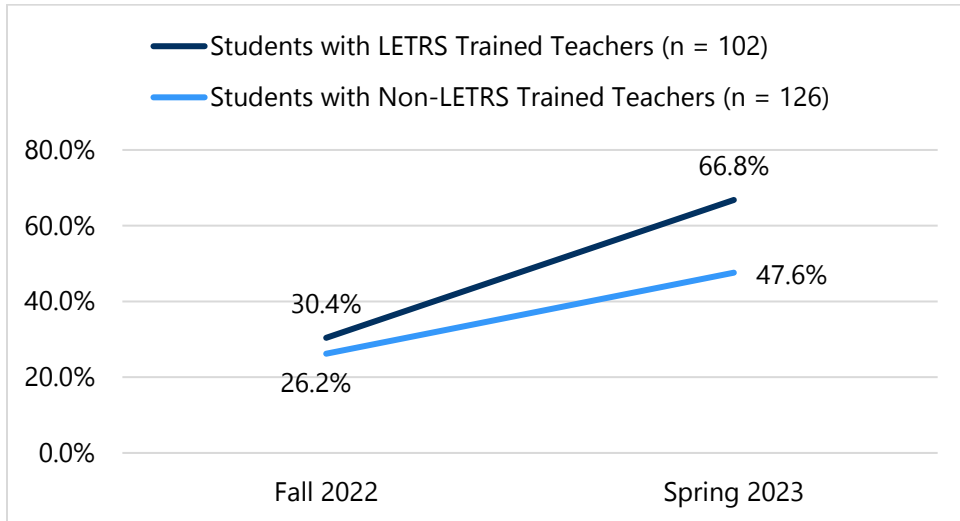
As shown below, the percentage of DDSD K-5 students performing at benchmark was roughly equal for LETRS trained vs. Non-LETRS trained teachers in the Fall and increased more for students of LETRS trained teachers than the comparison group by the Spring timepoint (Figure 26).

Figure 26. Percentage of DDS D K-5 Students At or Above Benchmark on Acadience



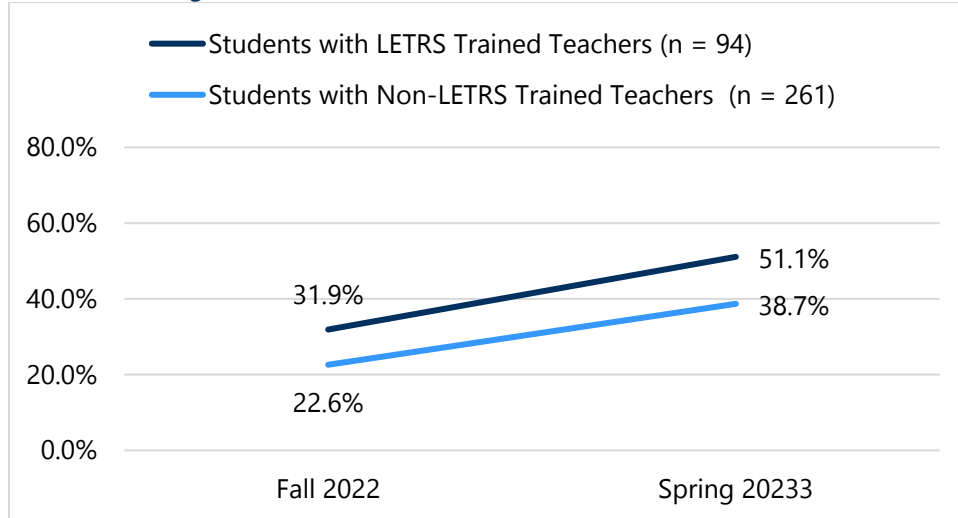
The next series of graphs will present the findings by grade level. Figure 27 shows that the percentage of kindergarten students performing at benchmark was just slightly lower for the comparison group in the Fall. By the Spring, the percentage of students reading at grade level was 19.2 percentage points higher for students of LETRS trained teachers.

Figure 27. Percentage of DDS D Kindergarten Students At or Above Benchmark on Acadience



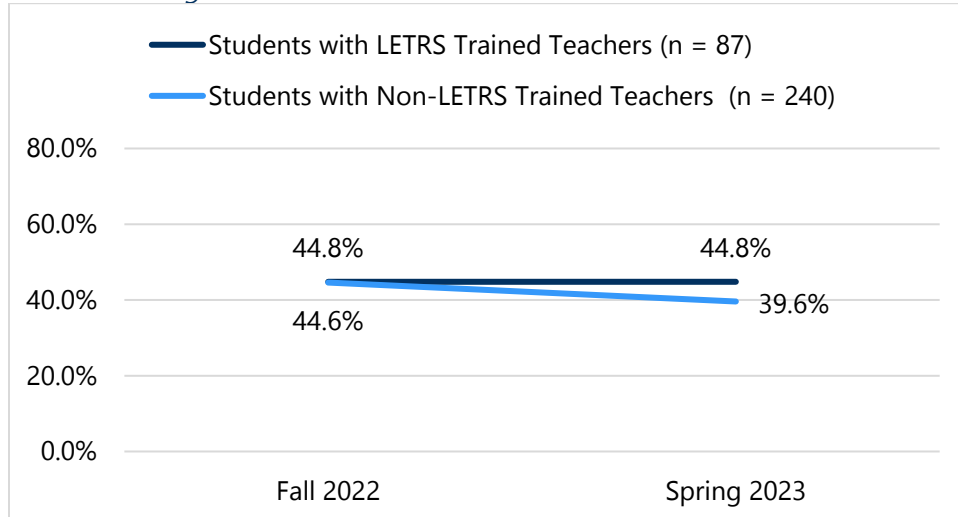
The percentage of first grade students performing at or above benchmark was lower for the comparison group in the Fall. By the Spring, the percentage of students reading at grade level was 12.4 percentage points higher for students of LETRS trained teachers. Figure 28).

*Figure 28. Percentage of DDS D 1st Grade Students At or Above Benchmark on Acadience*



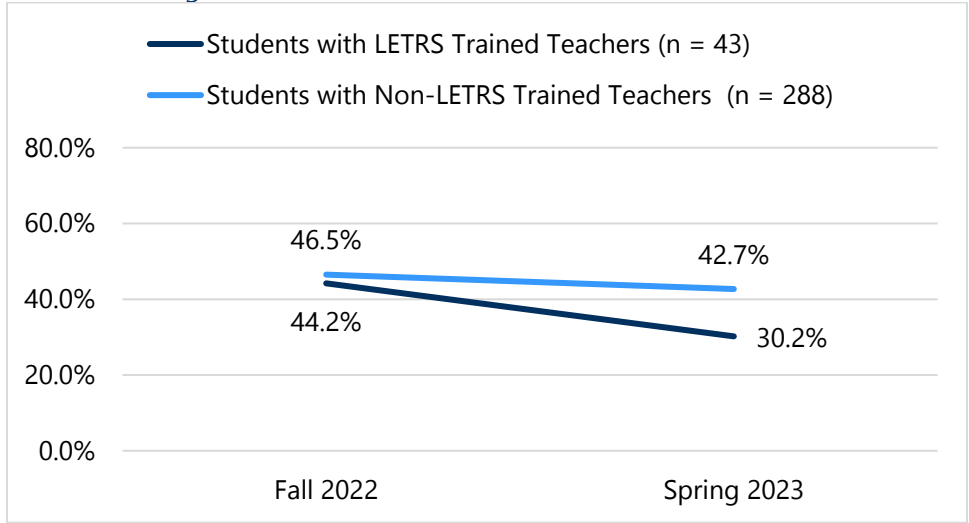
For second grade students in DDS D, the percentage of students performing at benchmark was the same for both groups in the Fall and decreased by 5% in the Spring for comparison group students Figure 29.

*Figure 29. Percentage of DDS D 2nd Grade Students At or Above Benchmark on Acadience*



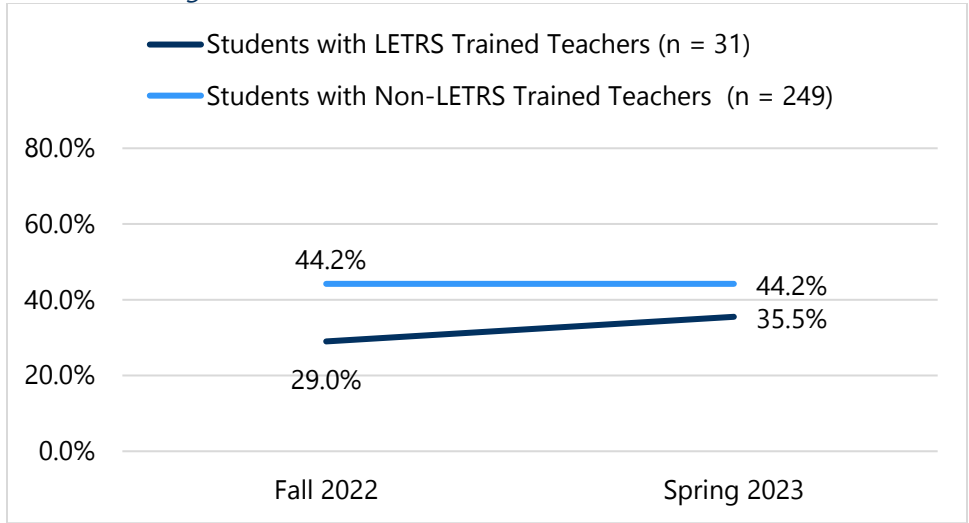
Third and fourth grade findings For third grade students in DDS D, the percentage of students performing at benchmark was about the same for both groups in the Fall and decreased by 14 percentage points in the Spring for treatment group students.

Figure 30. Percentage of DDSD 3rd Grade Students At or Above Benchmark on Acadience



For fourth grade students at DDSD, the percentage of students reading at grade level was 44.2% at both timepoints and increased from 29.0% to 35.5% for students of LETRS trained teachers.

Figure 31. Percentage of DDSD 4th Grade Students At or Above Benchmark on Acadience



## Parkrose School District

Parkrose School District used iReady reading as its primary literacy screener during the 2022-2023 school year. To examine the impact of LETRS training on student achievement, iReady data were analyzed for students of LETRS trained teachers (treatment) compared to a group of students whose teacher did not participate in the LETRS training (comparison). LETRS-trained teachers included any educator at Parkrose who had started the training and could be at any stage. The table below shows the progress of Parkrose educators and indicates that just over 60% of the 26 LETRS participants were on Volume 1 of the training.

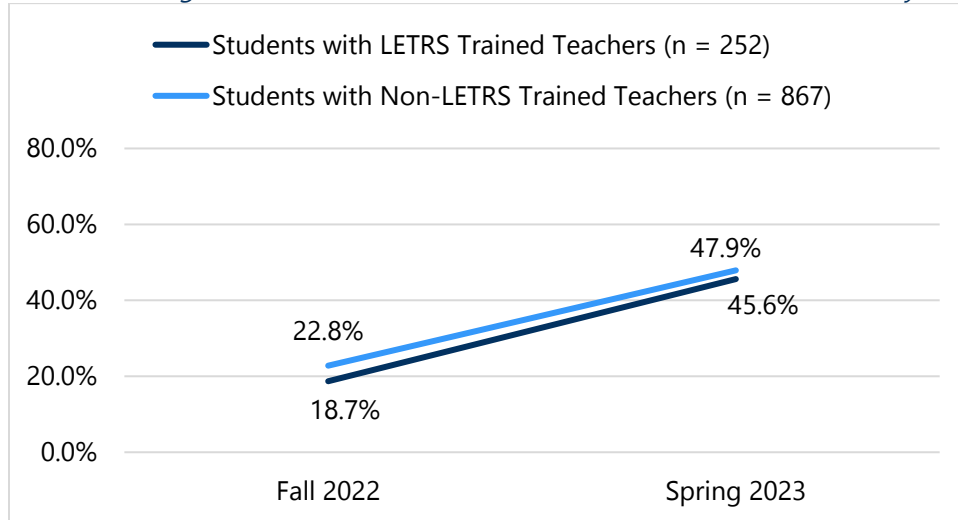
Table 16. Parkrose LETRS Participants' Progress on Training

Progress	% (n)
On Volume 1	61.5% (n = 16)
On Volume 2	26.9% (n = 7)
Completed	11.5% (n = 3)

Students' numeric scores were associated with five composite score categories: 1 grade level below, 2 grade levels below, 3 grade levels below, early on grade level, mid or above grade level. The percentage of students "early on grade level" or "mid or above grade level" for the iReady Reading assessment were combined and compared at the Fall and Spring timepoints for the two groups of students.

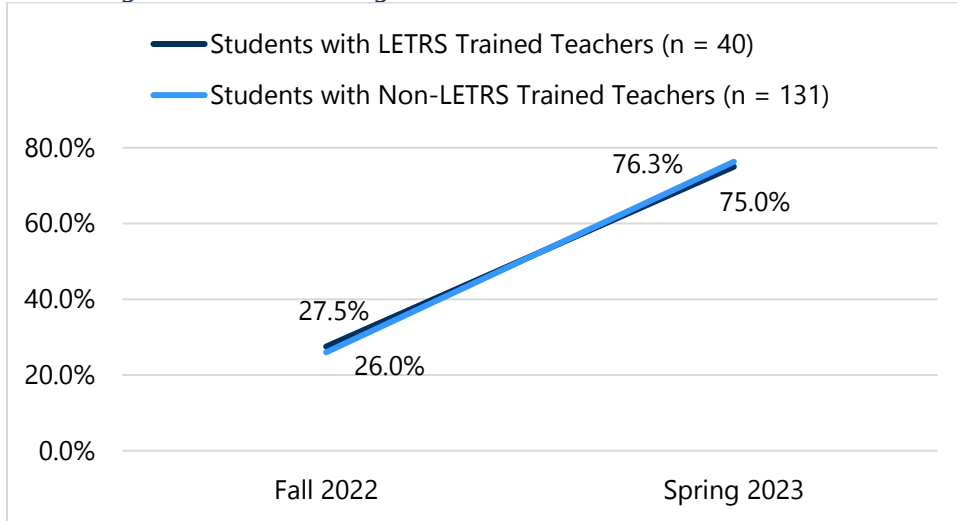
An analysis of iReady assessment data did not provide evidence of an overall impact of LETRS training on student reading achievement at Parkrose. As shown below, the percentage of Parkrose K-5 students performing at benchmark was roughly equal for LETRS trained vs. Non-LETRS trained teachers in the Fall and increased for both groups by the Spring timepoint (Figure 32).

Figure 32. Percentage of Parkrose K-5 Students At or Above Benchmark on iReady Reading



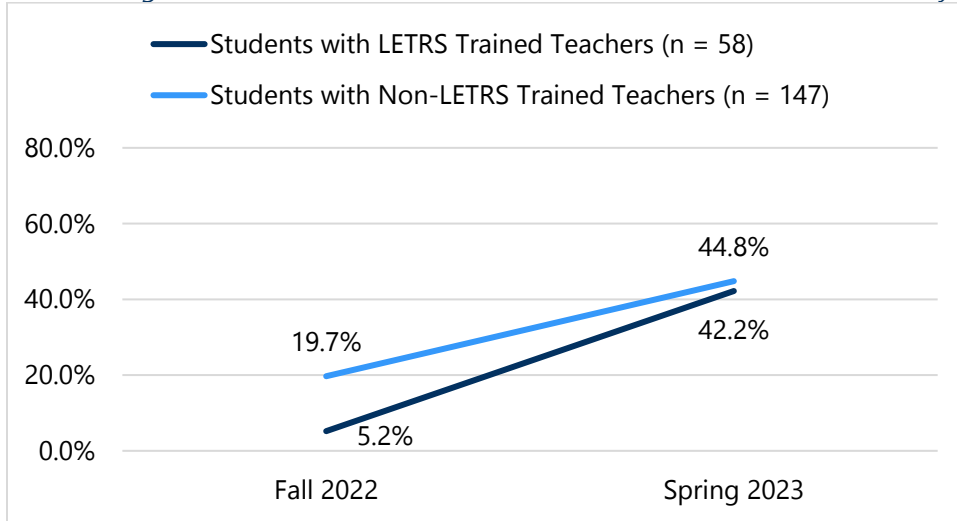
The next series of graphs will present the findings by grade level. Figure 33 shows that the percentage of kindergarten students performing at benchmark was nearly identical for students of LETRS trained teachers compared to non-LETRS trained teachers.

Figure 33. Percentage of Parkrose Kindergarten Students At or Above Benchmark on iReady Reading



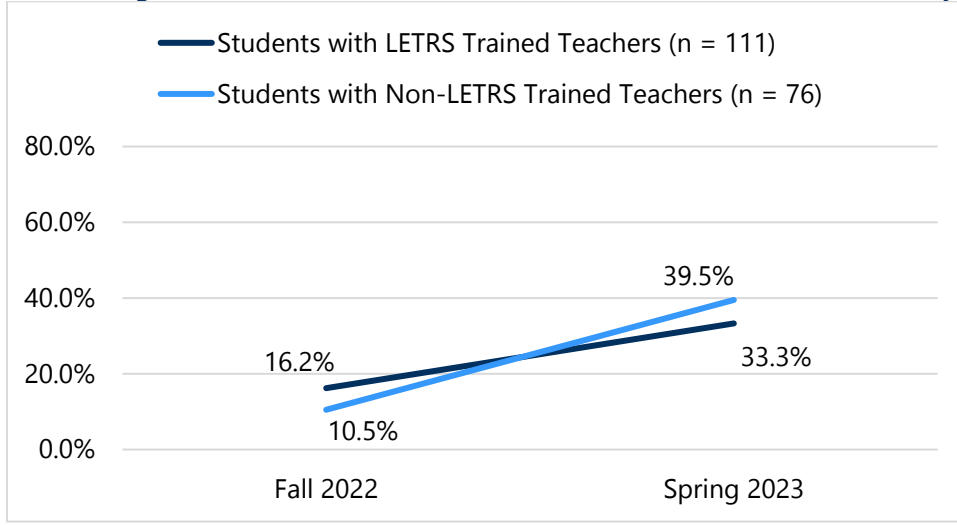
The percentage of first grade students performing at or above benchmark was lower for the treatment group in the Fall. By the Spring, the percentage of students reading at grade level had increased to 42.2% for treatment group students which was just slightly lower than the comparison group Figure 34).

Figure 34. Percentage of Parkrose 1st Grade Students At or Above Benchmark on iReady Reading



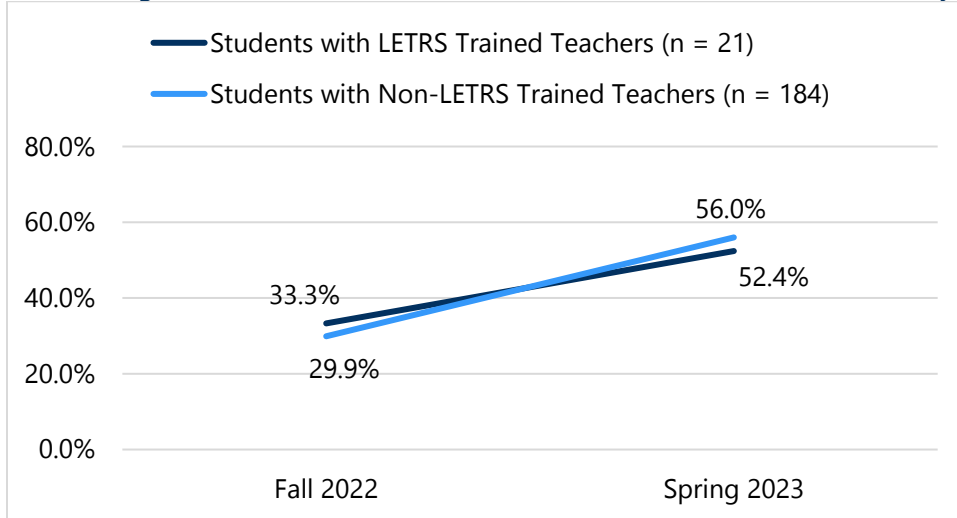
For second grade students in Parkrose, the percentage of students performing at benchmark was similar for both groups in the Fall and increased by more for comparison group students in the Spring Figure 35.

Figure 35. Percentage of Parkrose 2nd Grade Students At or Above Benchmark on iReady Reading



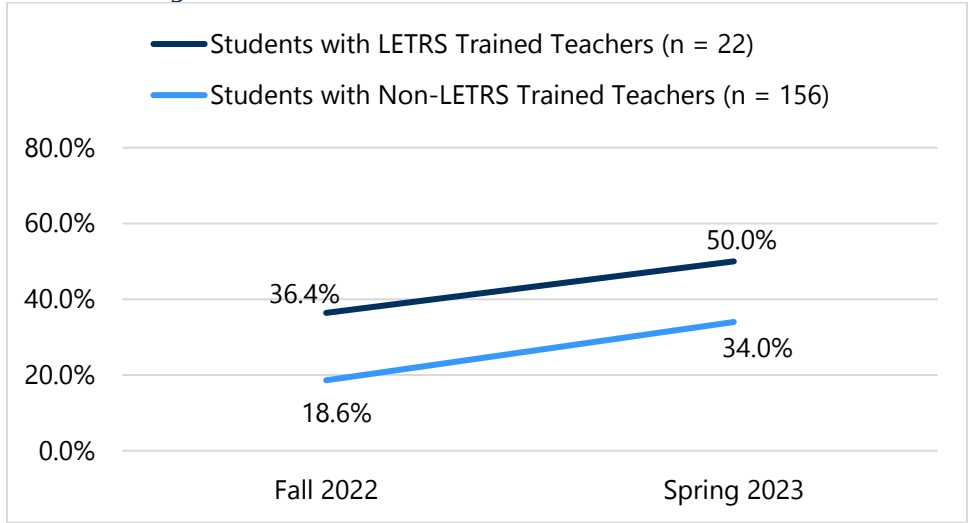
The number of 3<sup>rd</sup> grade students performing at benchmark in Parkrose was nearly identical for students of LETRS trained teachers compared to non-LETRS trained teachers.

Figure 36. Percentage of Parkrose 3rd Grade Students At or Above Benchmark on iReady Reading



Fourth grade students at Parkrose showed the most promising in the district but had the smallest sample size. By the Spring, 50.0% of students with LETRS trained teachers were reading at grade level compared to 34.0% of comparison group students. There were no iReady data for 5<sup>th</sup> grade students of LETRS trained teachers.

Figure 37. Percentage of Parkrose 4th Grade Students At or Above Benchmark on Acadience



## Portland Public Schools

Portland Public Schools used the DIBELS assessment as its primary literacy screener during the 2022-2023 school year. To examine the impact of LETRS training on student achievement, DIBELS composite performance indicators were analyzed for K-2 students of LETRS trained teachers (treatment) compared to a group of students whose teacher did not participate in the LETRS training (comparison).

LETRS-trained teachers included any K-2 educator at PPS who had started the training and could be at any stage. The table below shows the progress of PPS educators whose students were included in the analysis of achievement data.

Table 17. PPS LETRS Participants' Progress on Training

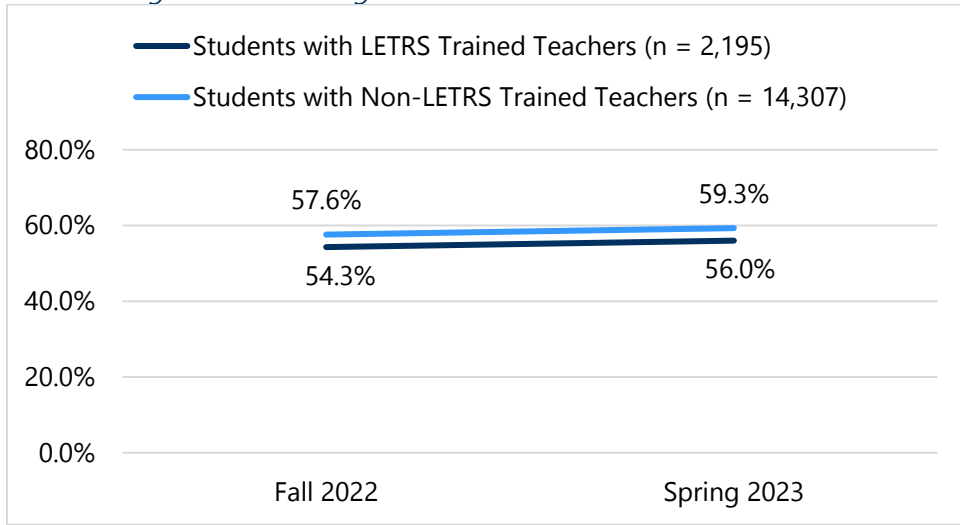
Progress	% (n)
On Volume 1	36.8% (n = 39)
On Volume 2	39.6% (n = 42)
Completed	23.6% (n = 25)

Student scores on the assessment are associated with three benchmark categories: intensive support; strategic support; and core support. Those attaining core support scores are considered to be at or above grade level. The percentage of students at the core level on the DIBELS Reading assessment were compared at the two timepoints for the two groups of students.

An analysis of DIBELS assessment data did not provide evidence of an overall impact of LETRS training on student reading achievement in Portland Public Schools. As shown below, the percentage of PPS K-2 students performing at benchmark was similar for students of LETRS trained teachers and the comparison group at both Fall and Spring timepoints with the comparison group having slightly higher rates of students reading at grade level in both the Fall and Spring (Figure 38).



Figure 38. Percentage of PPS K-2 Students at Core on DIBELS



The next series of graphs will present the findings by grade level. As shown below, the percentage of kindergarten and 1<sup>st</sup> grade students performing at benchmark was nearly identical for students of LETRS trained teachers compared to non-LETRS trained teachers (Figure 39 and Figure 40).

Figure 39. Percentage of PPS Kindergarten Students at Core on DIBELS

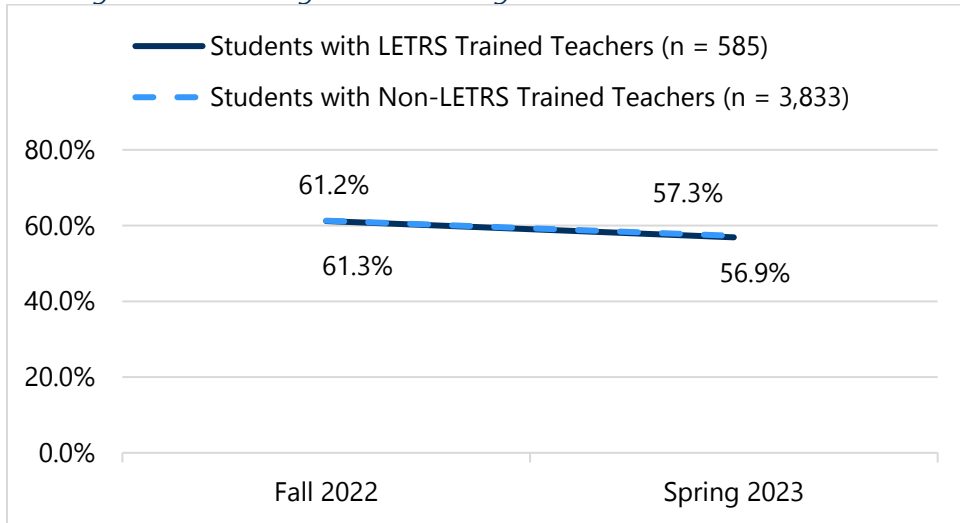
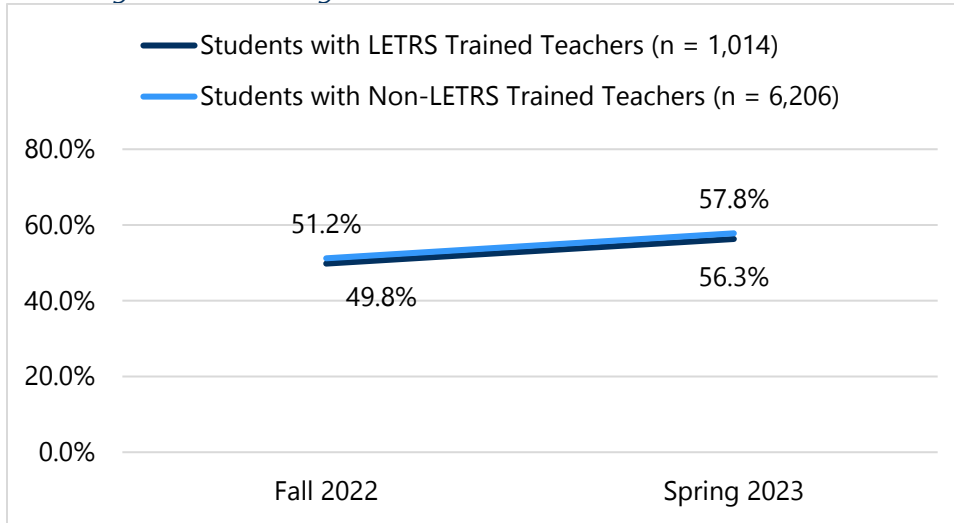
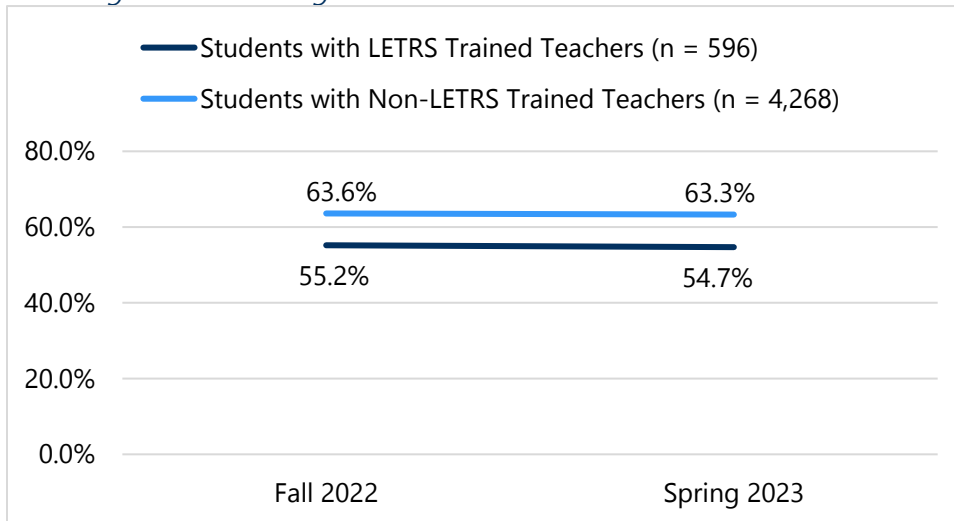


Figure 40. Percentage of PPS 1st Grade Students at Core on DIBELS



For second grade students in PPS, the percentage of students performing at benchmark was slightly higher for comparison group students than students of LETRS trained teachers at both Fall and Spring timepoints Figure 41.

Figure 41. Percentage of PPS 2nd Grade Students at Core on DIBELS



## Reynolds

Student outcomes on the DIBELS Reading assessment were examined for K-5 students at Reynolds School District to assess the impact of LETRS on students with teachers participating in the training (treatment) compared to those with teachers not participating in the training (comparison). Student scores on the assessment are associated with three benchmark categories: intensive support; strategic support; and core support. Those attaining core support scores are considered to be at or above grade level. The percentage

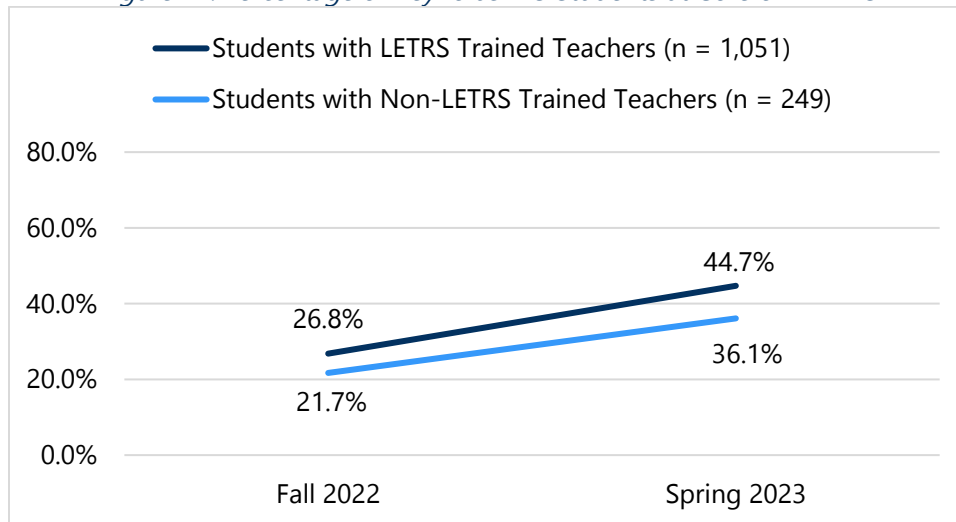
of students at the core level on the DIBELS Reading assessment were compared at the two timepoints for the two groups of students. LETRS-trained teachers included any educator at Reynolds who had started the training and could be at any stage. K-5 teachers with students who had data at both time points were included in the student achievement analysis. The table below shows the progress of Reynolds educators who were included in this analysis of achievement data.

*Table 18. Reynolds LETRS Participants' Progress on Training*

Progress	% (n)
On Volume 1	37.3% (n = 28)
On Volume 2	25.3% (n = 19)
Completed	37.3% (n = 28)

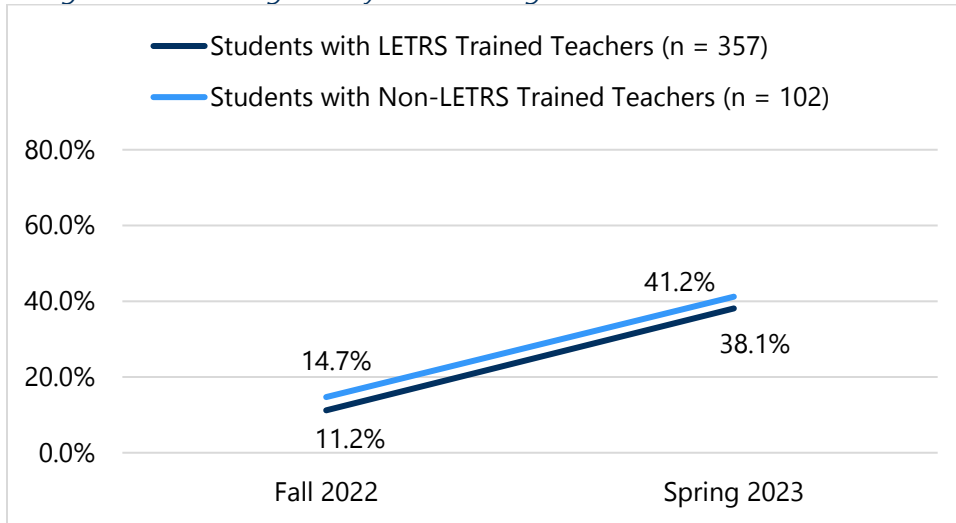
An analysis of Acadience assessment data **does** provide promising results regarding the impact of LETRS training on student reading achievement in RSD but this impact was not significant when examined through logistic regression analyses as described previously in this report. When looking at kindergarten through fifth grade students at Reynolds, treatment group students were reading at benchmark at higher rates than treatment group students at both the Fall and the Spring. The percentage students with LETRS trained teachers increased by more than the comparison group (Figure 42).

*Figure 42. Percentage of Reynolds K-5 Students at Core on DIBELS*



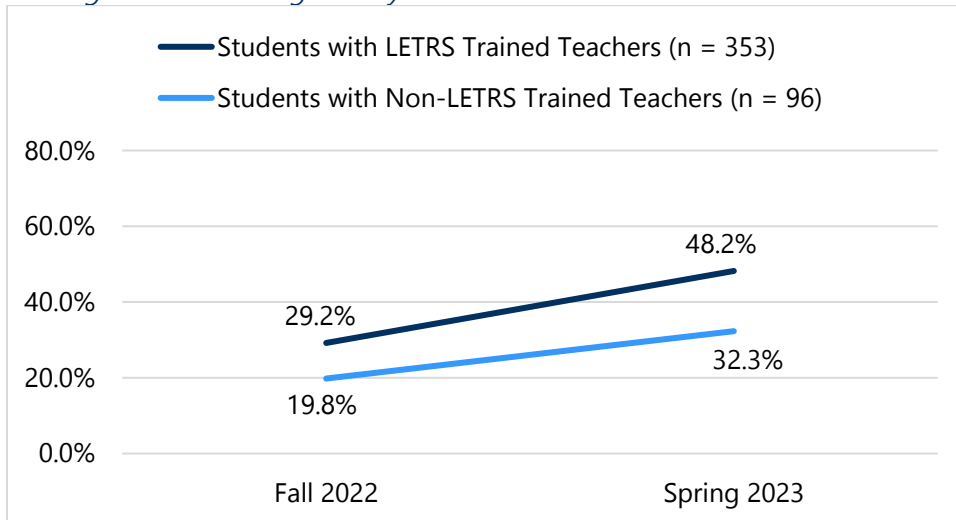
The percentage of kindergarten students at core on DIBELS was slightly higher for comparison group at both Fall and Spring timepoints (Figure 43). Both groups of students demonstrated a noteworthy increase in core attainment from Fall to Spring.

Figure 43. Percentage of Reynolds Kindergarten Students at Core on DIBELS



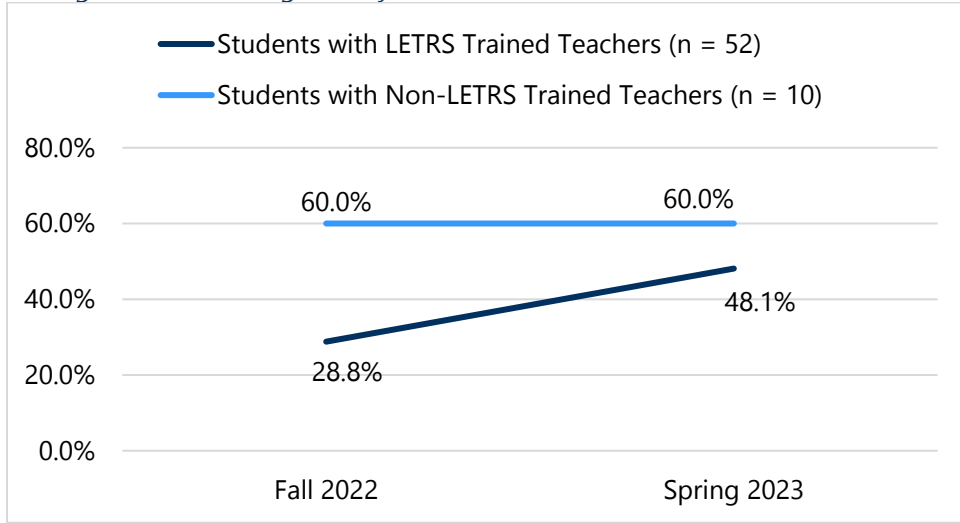
First grade students with LETRS trained teachers scored at the core level on DIBELS at higher rates at both timepoints than students whose teachers did not participate in LETRS. By the Spring, the percentage of students reading at grade level was 15.9 percentage points higher for students of LETRS trained teachers.

Figure 44. Percentage of Reynolds 1<sup>st</sup> Grade Students at Core on DIBELS



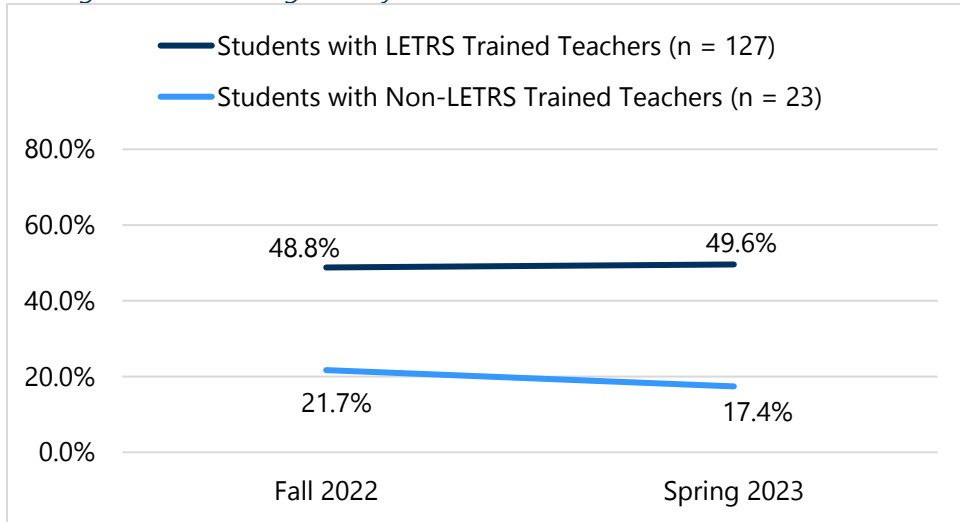
Although comparison group students were at the core on DIBELS at higher rates in the Spring compared to treatment group students, there was a noteworthy increase from Fall to Spring for these students with LETRS trained teachers; whereas, the comparison group's rate at achieving core remained steady (Figure 45).

Figure 45. Percentage of Reynolds 2nd Grade Students at Core on DIBELS



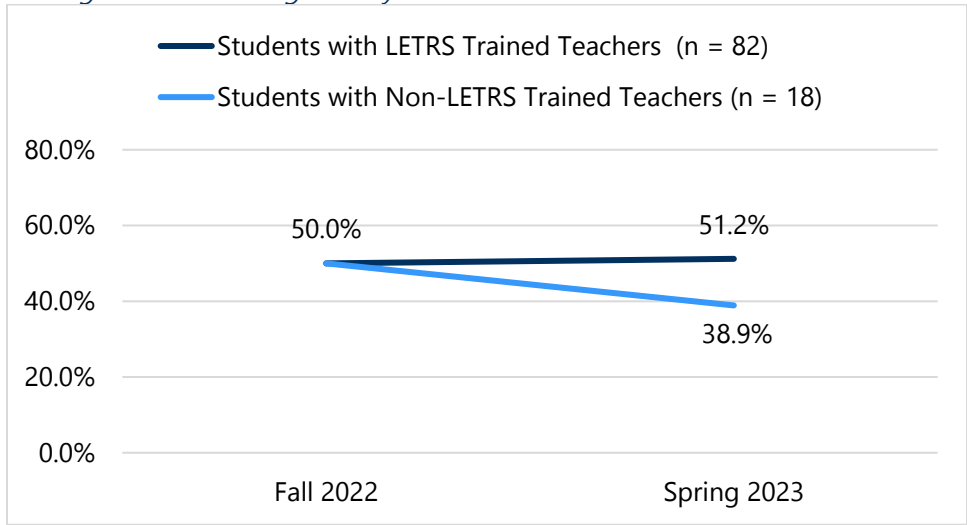
The rate of fourth grade treatment group students who were at core on DIBELS remained fairly steady across the two timepoints, while the comparison group decreased slightly. Notably, the percentage of fourth grade students reading at the core level was 32.2 percentage points higher for students of LETRS trained teachers in the Spring (Figure 46).

Figure 46. Percentage of Reynolds 4th Grade Students at Core on DIBELS



Half of the fifth grade students from both groups were at core on DIBELS in the Fall. While this rate increased very slightly for the treatment group, there was a noteworthy decrease for comparison group students from Fall to Spring (Figure 47).

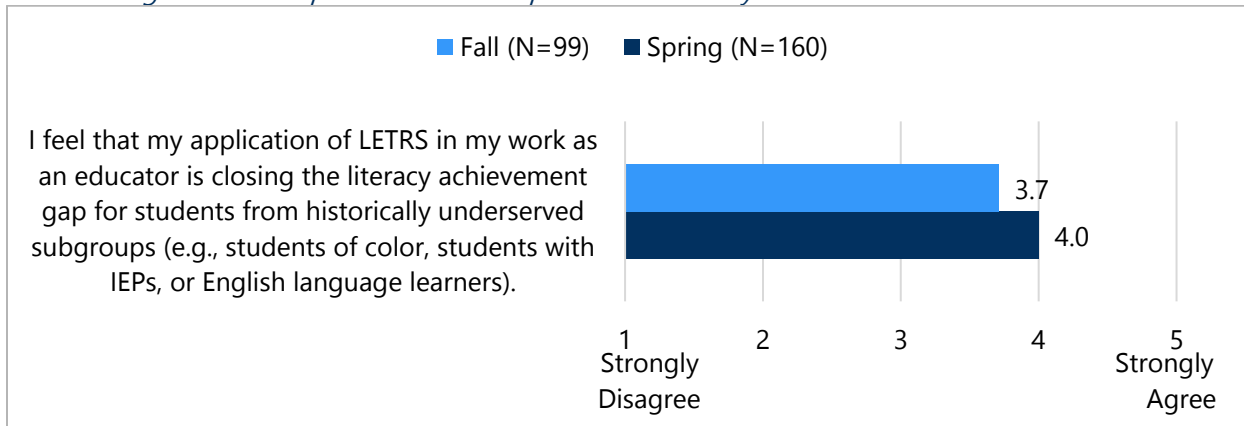
Figure 47. Percentage of Reynolds 5th Grade Students at Core on DIBELS



### What was the impact of LETRS training on students from historically underserved student subgroups?

On average, educators mostly agreed that their efforts to apply what they learned from LETRS into their work was helping to close the achievement gap for students from historically underserved backgrounds, such as students of color, those with individualized education plans (IEPs), and those who are English language learners. Educators were slightly more likely to agree with this statement at the Spring timepoint compared to the Fall, as shown in Figure 48.

Figure 48. Perceptions of LETRS Impact on Historically Underserved Student Outcomes



# Centennial School District

The rate of students at or above benchmark on the Acadience and at/above benchmark on the STAR assessment (depending on grade level) was examined for SPED and historically underserved race/ethnicity groups with LETRS trained teachers (treatment) and students with non-LETRS trained teachers (comparison) in Fall 2022 and Spring 2023.

The rate of SPED kindergarten and first grade students scoring at or above benchmark on the Acadience assessment decreased slightly from Fall to Spring for treatment group students while increasing for comparison group students (Figure 49).

Figure 49. Percentage of Centennial K-1 SPED Students At or Above Benchmark on Acadience

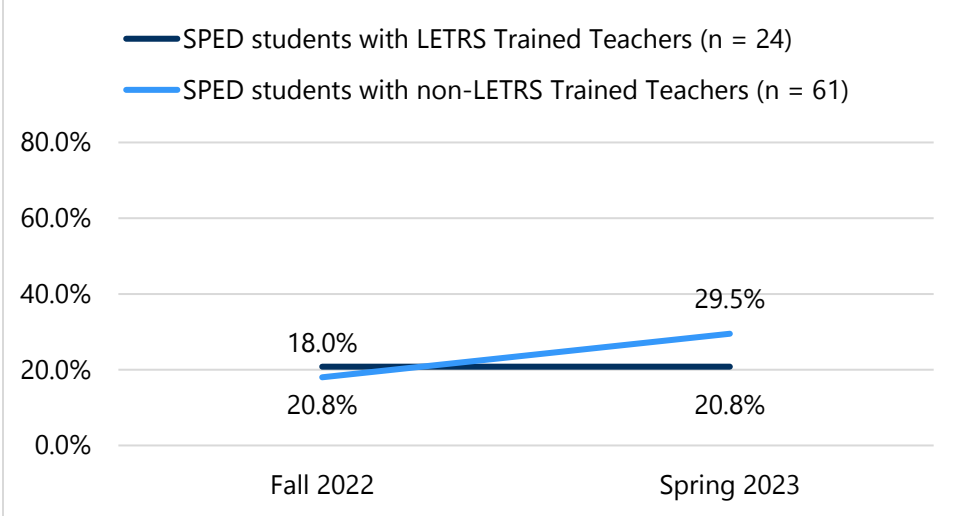
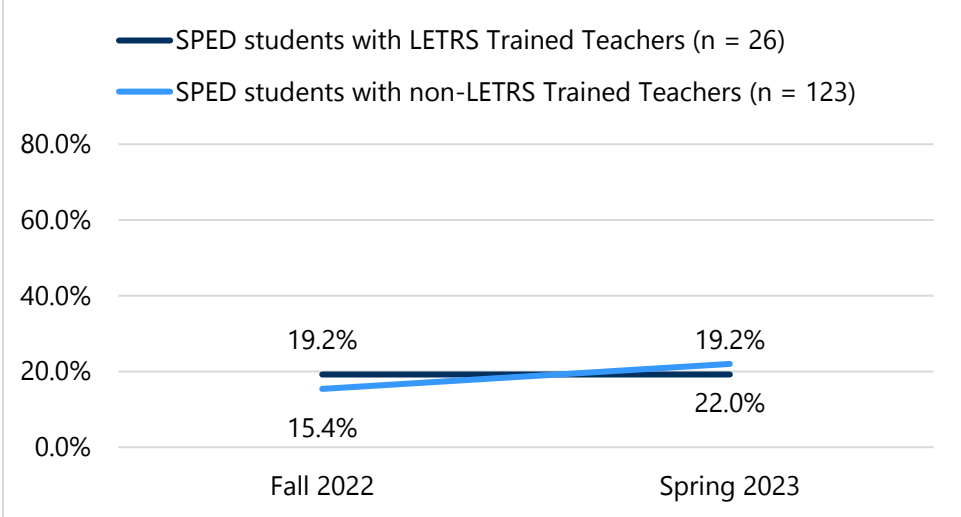


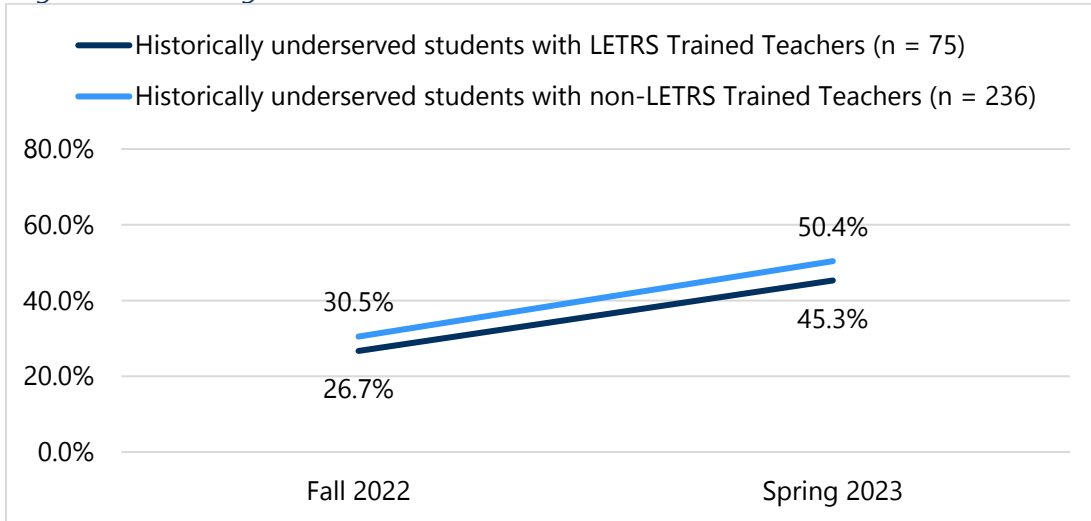
Figure 50 demonstrates that second through fifth grade SPED students in the treatment group achieved at/above benchmark scores on the STAR assessment at the same rate at both timepoints; whereas, there was a slight increase in scoring at/above benchmark for treatment group students from Fall to Spring.

Figure 50. Percentage of Centennial 2-5 SPED Students At or Above Benchmark on STAR



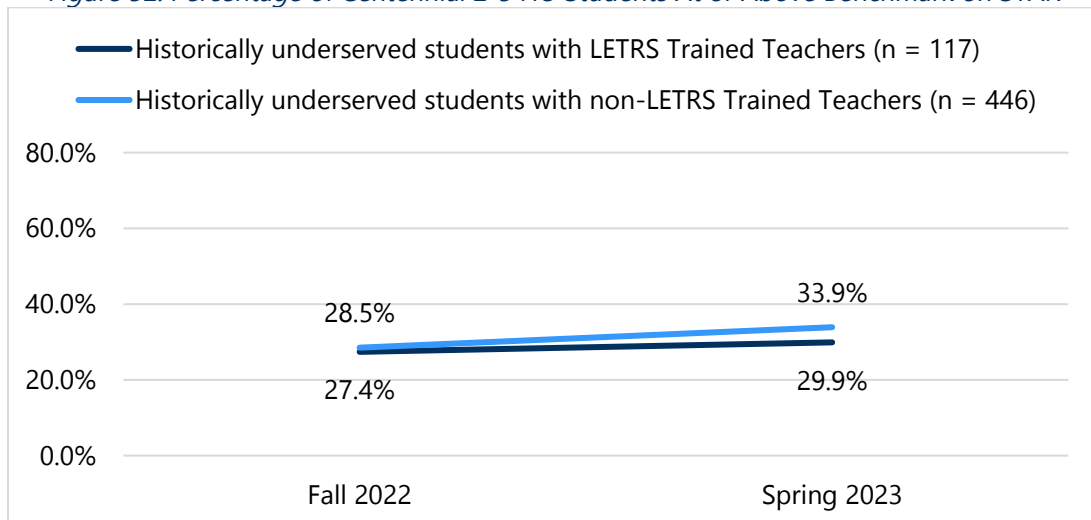
When looking at Acceince scores for kindergarten and first grade students from historically underserved race/ethnicity groups, comparison group slightly outperformed treatment group students at both timepoints (Figure 51).

Figure 51. Percentage of Centennial K-1 HU Students At or Above Benchmark on Acadience



While the rate of second through fifth grade students from historically underserved race/ethnic groups scoring at/above benchmark was about the same in the Fall for students regardless of whether their teacher was participating in LETRS, the comparison group slightly outpaced the treatment group in the Spring (Figure 52).

Figure 52. Percentage of Centennial 2-5 HU Students At or Above Benchmark on STAR



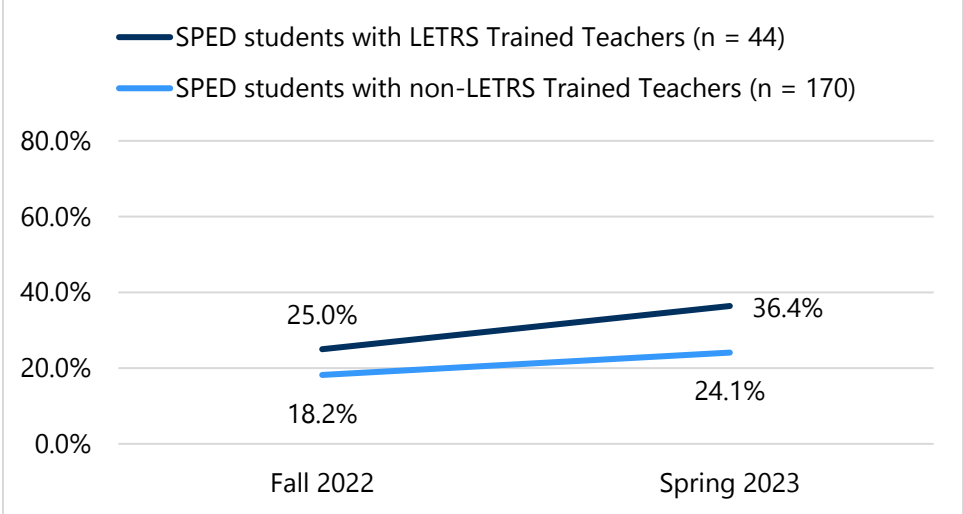


# David Douglas School District

The percent of students at or above benchmark on the Acadience assessment was examined for SPED, ELL, and historically underserved race/ethnicity groups with LETRS trained teachers (treatment) and students with non-LETRS trained teachers (comparison) in Fall 2022 and Spring 2023.

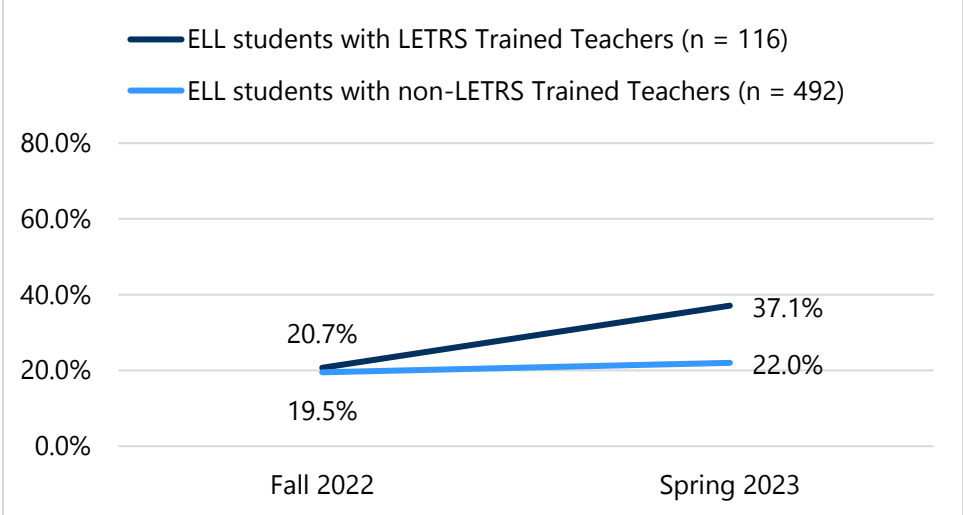
The percentage of SPED students reading at or above benchmark in grade K-5 at DDS D was slightly higher for students of LETRS trained teachers in the Fall and increased by 16.4% by the Spring (Figure 53).

Figure 53. Percentage of DDS D K-5 SPED Students At or Above Benchmark on Acadience



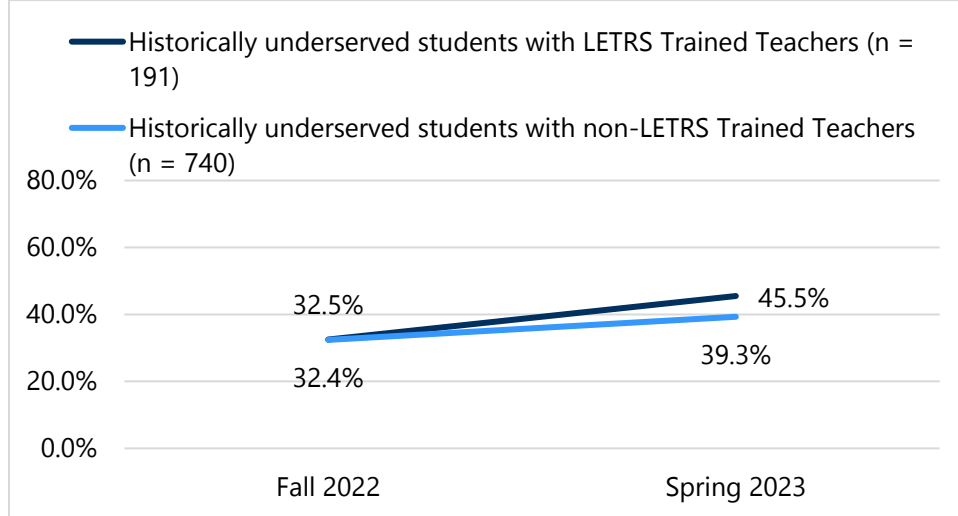
Acadience scores were examined for English Language Learners in grades K-5 in DDS D. The percentage of ELL students with LETRS trained teachers was similar to the comparison group in the Fall but increased by 16.4 percentage points in the Spring (Figure 54).

Figure 54. Percentage of DDS D K-5 ELL Students At or Above Benchmark on Acadience



Finally, Acadience scores were examined for Historically Underserved race/ethnicities in grades K-5 in DDSD. Similar to English Language Learners the percentage of HU students with LETRS trained teachers was similar to the comparison group in the Fall but increased by 13 percentage points in the Spring. (Figure 55).

*Figure 55. Percentage of DDSD K-5 HU Students At or Above Benchmark on Acadience*

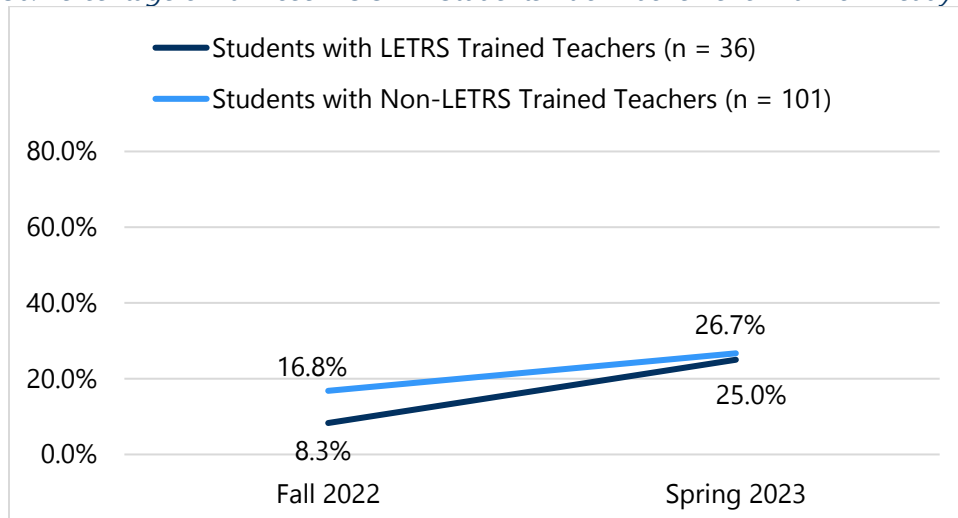


## Parkrose School District

The percent of students at or above benchmark on the iReady reading assessment was examined for SPED, ELL, and historically underserved race/ethnicity groups with LETRS trained teachers (treatment) and students with non-LETRS trained teachers (comparison) in Fall 2022 and Spring 2023.

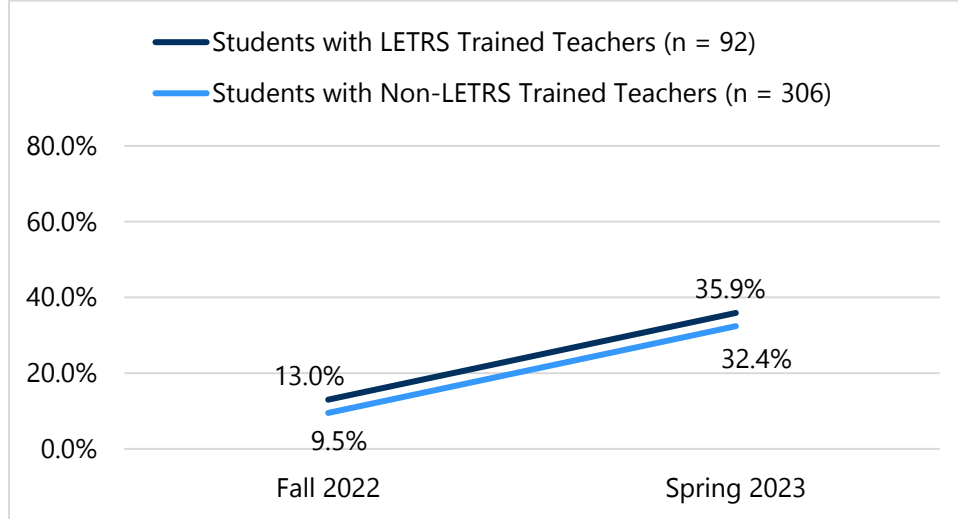
The percentage of SPED students reading at or above benchmark in grade K-5 at Parkrose was slightly higher for comparison students in the Fall but was nearly equal by the Spring timepoint. (Figure 56).

*Figure 56. Percentage of Parkrose K-5 SPED Students At or Above Benchmark on iReady Reading*



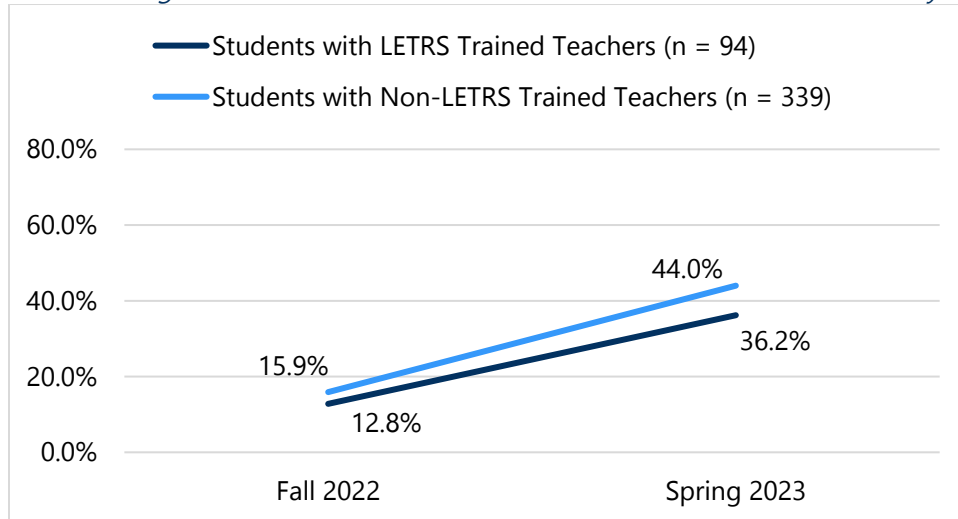
iReady reading scores were examined for English Language Learners in grades K-5 in Parkrose. The percentage of ELL students with LETRS trained teachers was slightly higher than the comparison group at both timepoints (Figure 57).

Figure 57. Percentage of Parkrose K-5 ELL Students At or Above Benchmark on iReady Reading



Finally, iReady scores were examined for Historically Underserved race/ethnicities in grades K-5 in Parkrose. Although both groups started out with about the same percentage of HU students reading at grade level in the Fall, the comparison group had a slightly higher number at the Spring timepoint.

Figure 58. Percentage of Parkrose K-5 HU Students At or Above Benchmark on iReady Reading

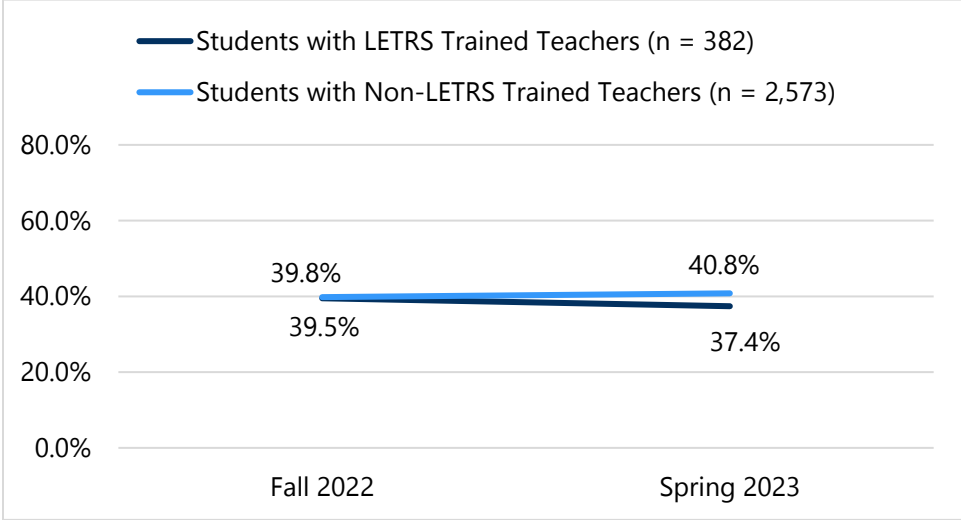


# Portland Public Schools

The percent of students at or above benchmark on the DIBELS reading assessment was examined for SPED, ELL, and historically underserved race/ethnicity groups with LETRS trained teachers (treatment) and students with non-LETRS trained teachers (comparison) in Fall 2022 and Spring 2023.

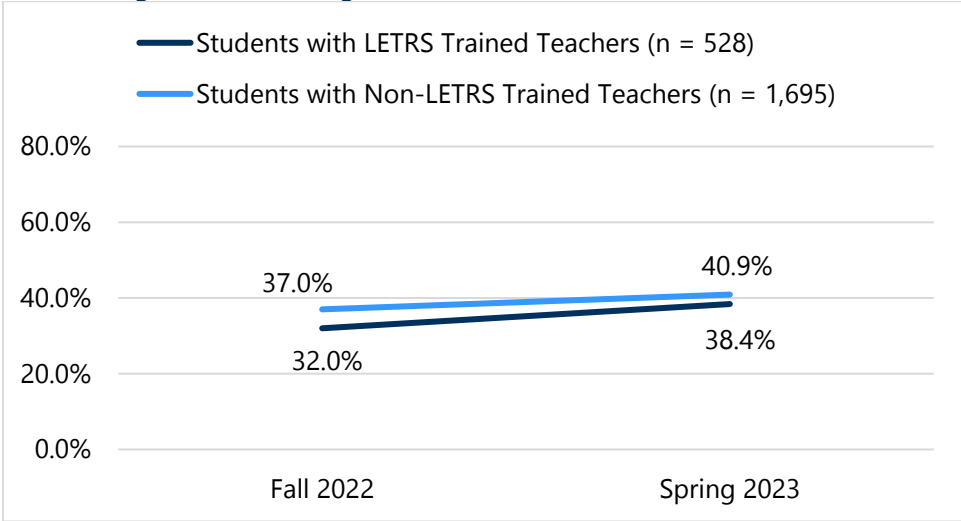
The percentage of SPED students reading at or above benchmark in grade K-5 at PPS was nearly identical for comparison students in the Fall and Spring timepoints (Figure 59).

Figure 59. Percentage of PPS SPED Students at Core on DIBELS



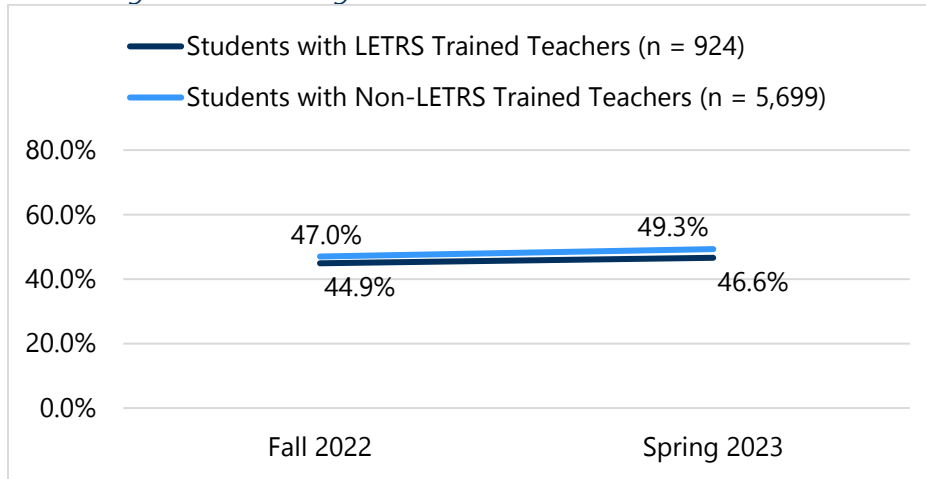
DIBELS reading scores were examined for English Language Learners in grades K-2 in PPS. The percentage of ELL students reading at benchmark in the comparison group was slightly higher than the LETRS group at both timepoints. (Figure 60).

Figure 60. Percentage of PPS K-2 ESL Students Core on DIBELS



Finally, DIBELS scores were examined for Historically Underserved race/ethnicities in grades K-2 in PPS. The percentage of students reading at benchmark was nearly identical regardless of the LETRS training.

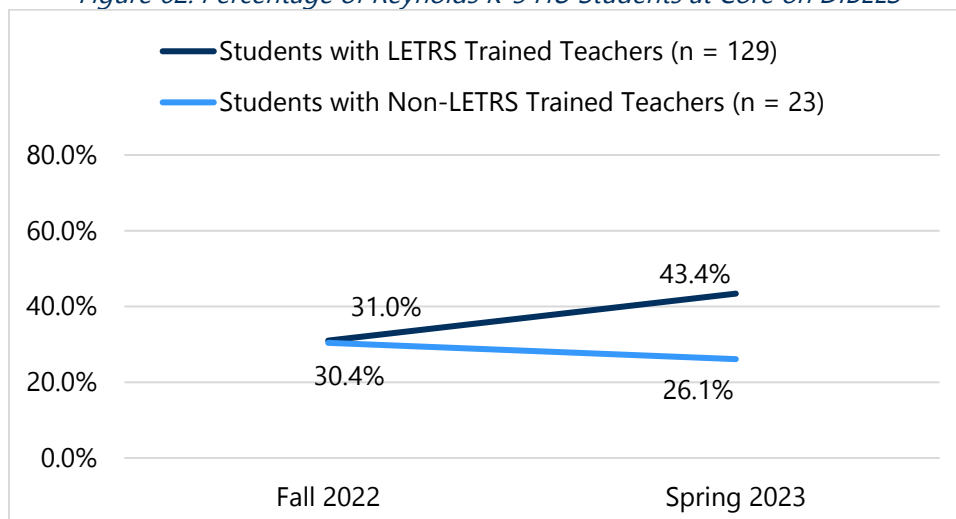
Figure 61. Percentage of PPS K-2 HU Students Core on DIBELS



## Reynolds School District

The percent of students at the core level on the DIBELS reading assessment was examined for historically underserved race/ethnicity groups with LETRS trained teachers (treatment) and students with non-LETRS trained teachers (comparison) in Fall 2022 and Spring 2023. The figure below illustrates that while students from both groups scored at the core level at similar rates in the Fall, treatment group rates increased from Fall to Spring and comparison group rates decreased. By Spring, the percentage of historically underserved students reading at grade level was 17.3 percentage points higher for students of LETRS trained teachers. These findings were further explored through logistic regression analysis and showed that students of historically underserved race/ethnicity groups with LETRS trained teachers were 7.54 times more likely to have a Spring reading composite score at or above benchmark compared to HU students of non-LETRS trained teachers.

Figure 62. Percentage of Reynolds K-5 HU Students at Core on DIBELS



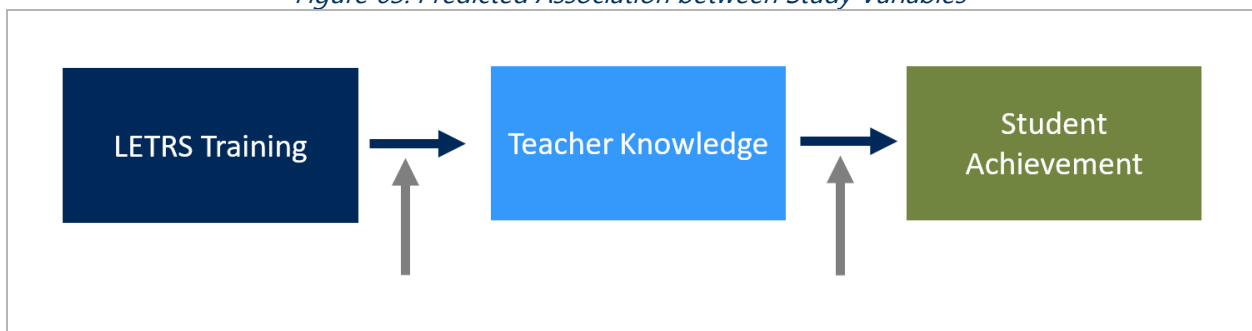
# PPS SUPPLEMENTAL STUDY FINDINGS

## Study Design

Previous research on the impact of LETRS training suggests a positive association between LETRS training and teacher knowledge, and also a positive association between teacher knowledge and student reading outcomes.<sup>4</sup> The direct relationship between LETRS training and student reading outcomes has been hypothesized, but has remained somewhat elusive to researchers (for more information on the body of research surrounding LETRS, see the literature review prepared by PRE which helped to inform this study). This supplemental study sought to explore the connection between LETRS training, teacher knowledge, and student achievement, using a sample of LETRS trained and non-LETRS trained PPS teachers.

The predicted association between LETRS training, teacher knowledge, and student achievement is graphically displayed in Figure 63. The blue arrows in the model represent the predicted association between these main variables of interest, while the grey arrows represent potential moderating effects that could influence the main effects. Moderators that were measured and are discussed in the findings that follow include teacher beliefs about code-based and meaning-based instructional styles, and aspects of teacher's experiences such as their educational background.

*Figure 63. Predicted Association between Study Variables*



## Methods

Participation in this supplemental study was limited to only PPS educators to control for potentially confounding district-level factors, and because PPS could offer an adequately large sample of both LETRS trained and non-LETRS-trained educators. An online survey administered in the Spring of 2023 was used to assess teacher knowledge and beliefs regarding reading instruction. Teacher knowledge was measured using a 37 item Knowledge of Basic Language Constructs<sup>5</sup> instrument, which focused on phonological and

<sup>4</sup> Garet, M. S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., ... & Szejnberg, L. (2008). The Impact of Two Professional Development Interventions on Early Reading Instruction and Achievement. NCEE 2008-4030. National Center for Education Evaluation and Regional Assistance.

<sup>5</sup> Binks-Cantrell, E., Joshi, R. M., & Washburn, E. K. (2012). Validation of an instrument for assessing teacher knowledge of basic language constructs of literacy. *Annals of dyslexia*, 62, 153-171.

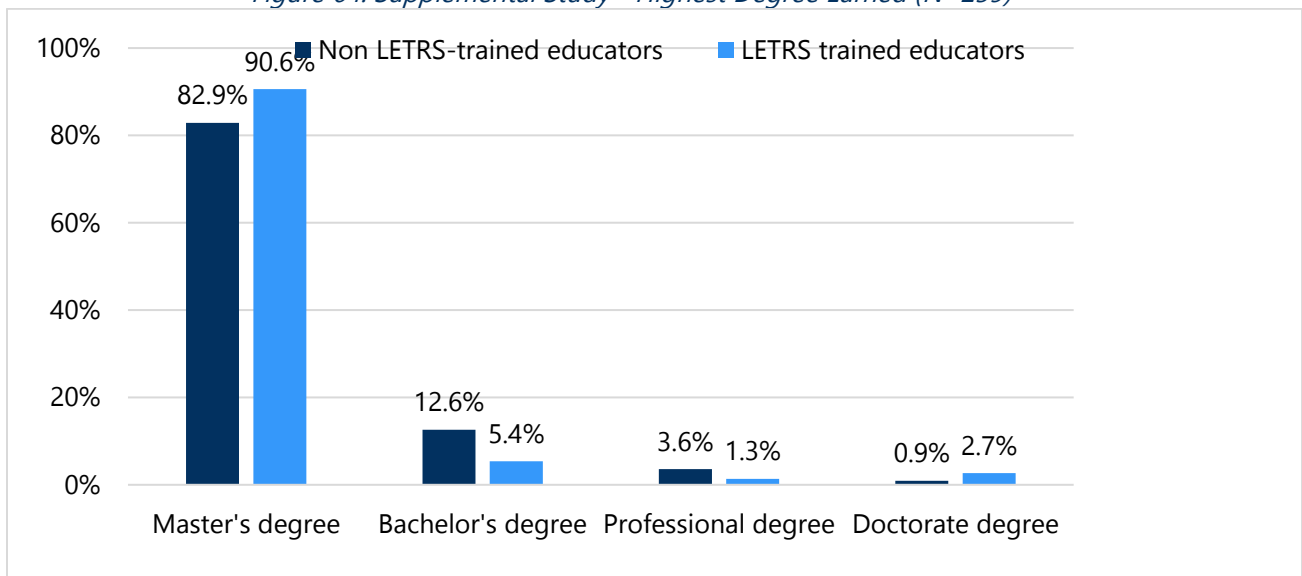
decoding knowledge and skill. All items on the knowledge measure were coded as either correct or incorrect, and averaged to produce a percent correct teacher knowledge score. The Teacher Beliefs Survey<sup>6</sup> was used to measure beliefs about both code-based (i.e., more aligned with phonics and the science of reading) and meaning-based (i.e., more aligned with whole language approaches) literacy instruction, using a 6-point scale from strongly disagree (coded as 1) to strongly agree (coded as 6). The survey also asked teachers about their educational background, and whether they had participated in LETRS training (and if so, how far they had progressed). Student achievement in this supplemental study was considered at the teacher-level. Each participating teacher who had students with available Fall 2022 and Spring 2023 assessment data was measured on the percent of students at or above benchmark (i.e., Core Support or above according to DIBELS) at both timepoints.

PPS Supplemental Study Survey Respondents

Participants (N=261) included educators who had been exposed to LETRS training (n=150), as well as a control group of educators who had not yet had any LETRS training (n=111). Participants were able to skip questions and/or exit the survey before completing all aspects. Therefore, the number of responses that findings are based on throughout this section will vary and will be noted.

All educators worked with students in the kindergarten through fifth grade range. Of educators who indicated their primary role (N=259), most were classroom teachers (61.0%) followed by speech language pathologists (10.0%) and instructional specialists (7.3%). Of educators who shared their highest degree earned (N=260), the large majority of both the LETRS trained group (90.6%) and the control group (82.9%) held master’s degrees (see Figure 64).

Figure 64. Supplemental Study - Highest Degree Earned (N=259)

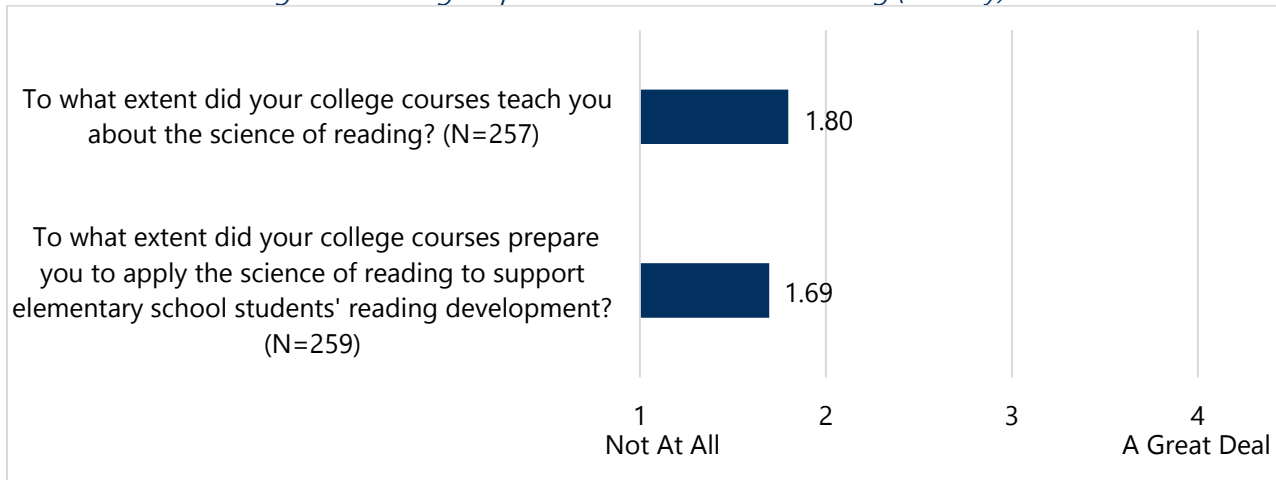


<sup>6</sup> Bills, B. (2020). Teacher Knowledge, Beliefs, and instructional practices in early literacy: a comparison study. University of Nebraska at Omaha.

## Findings

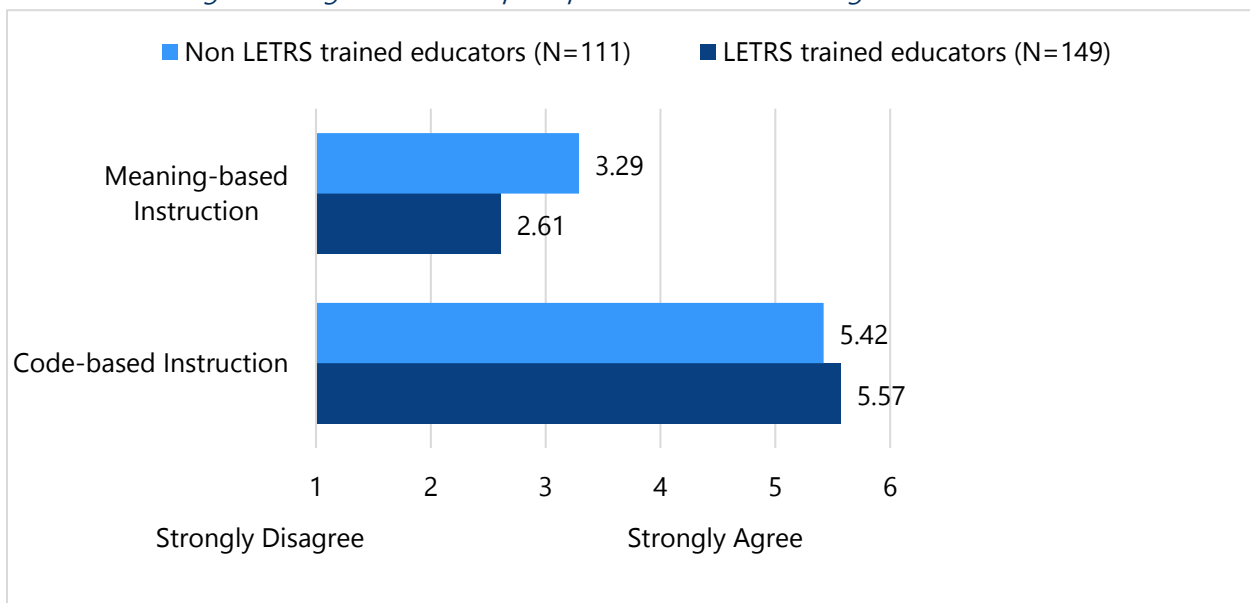
On average, educators indicate that they had learned only a slight amount (i.e., represented by a 2 on a 4-point scale) about the science of reading during their college experience, and that their college experience had only slightly prepared them to apply those concepts to their work supporting developing readers (see Figure 65).

Figure 65. College experience with Science of Reading (N's vary)



Findings from the Teacher Beliefs instrument suggest that surveyed educators' beliefs generally aligned more with code-based instructional practices than meaning-based instructional practices. While this was true for educators who were LETRS trained as well as those who were not, those who were LETRS trained indicated slightly less agreement with meaning-based instructional beliefs compared to those who were not (see Figure 66).

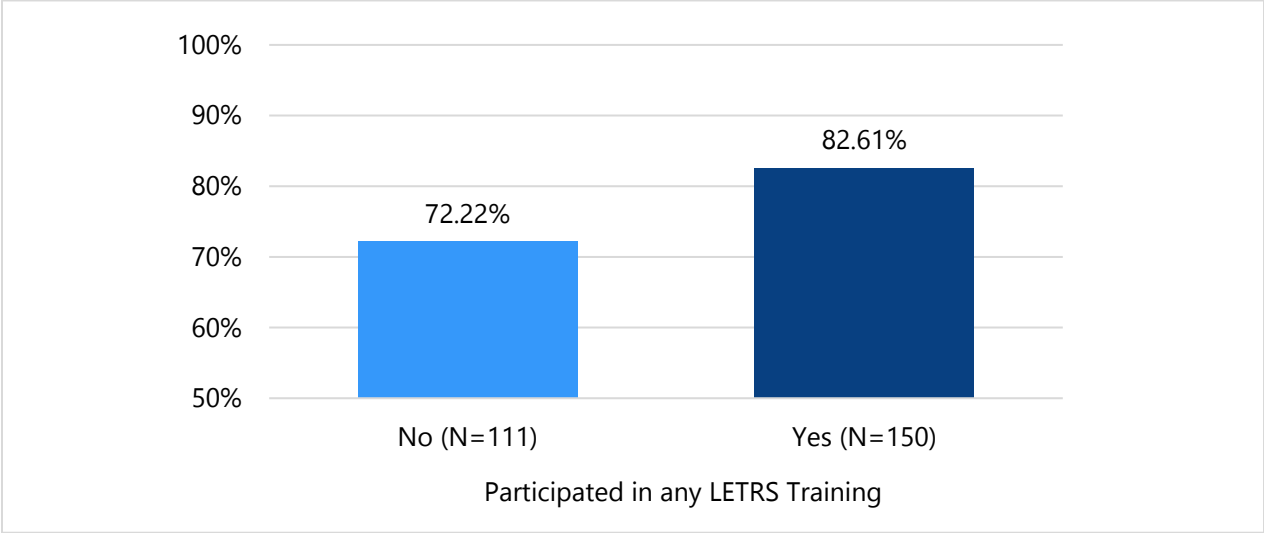
Figure 66. Agreement with principles of Code vs. Meaning-based Instruction





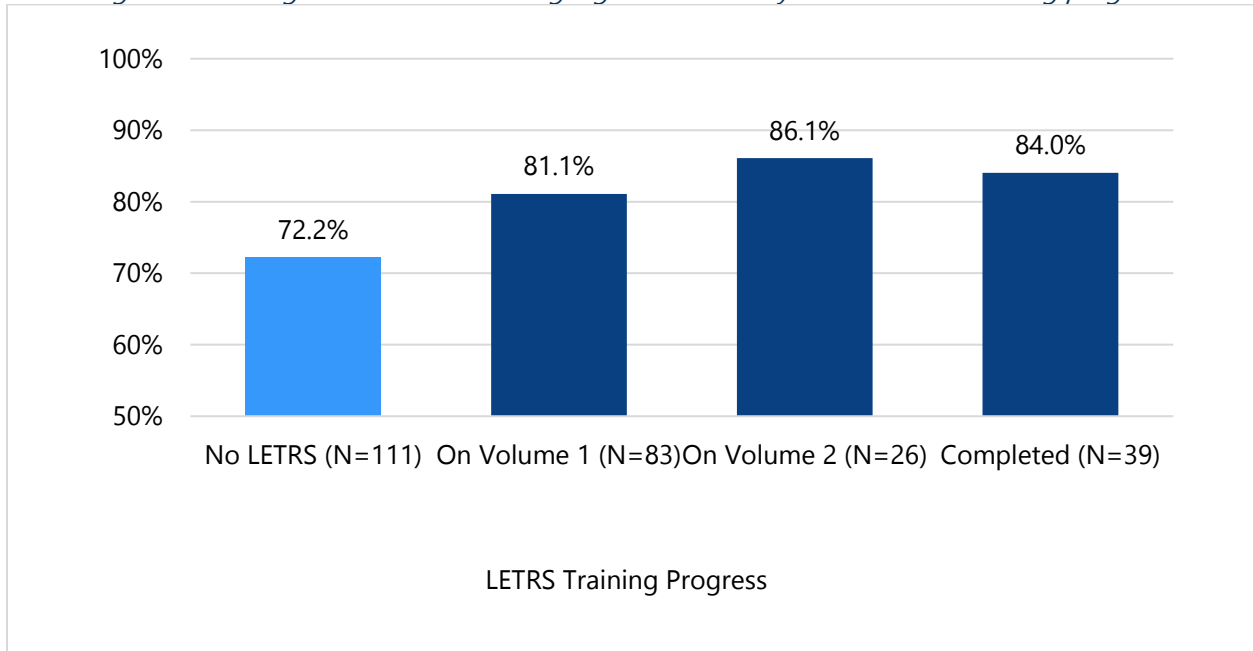
When it came to educators' knowledge, those who had participated in LETRS training were more likely to score higher on the Basic Language Constructs test compared to educators who had not yet participated in LETRS training (see Figure 67). Further statistical analysis revealed that this difference in knowledge between LETRS and non LETRS-trained teacher was significant ( $p < .001$ ), and that there was a small but meaningful effect size ( $\eta_p^2 = .21$ ). Teacher's beliefs about code or meaning-based instructional practices were looked at as a moderator between LETRS participation and knowledge, but were not found to be significant.

Figure 67. Average Scores on Basic Language Constructs Test



Although LETRS participation was a significant predictor of participants' knowledge of basic language constructs, post-hoc analyses revealed no further significant differences in knowledge based on how far educators had progressed through their LETRS training (see Figure 68). One potential explanation for this is that the items on the knowledge test were mostly related to topics that are introduced in LETRS Volume 1 rather than Volume 2.

Figure 68. Average Scores on Basic Language Constructs by level of LETRS training progress



Only eighty of the educators who participated in this supplemental study could be linked to students with available Fall 2022 and Spring 2023 DIBELS (i.e., the assessment used by PPS to measure student reading achievement) data. At the teacher-level, student achievement results were measured by calculating, for each teacher, the percentage of their students (based on available data) who were at or above benchmark (i.e., Core support or above) according to the DIBELS assessment.

A linear regression was conducted to assess the relation between educators' knowledge and the percent of their students who were at or above benchmark at the Spring 2023 timepoint, controlling for the percent of students at or above benchmark in the Fall of 2022. The results of this analysis were non-significant, as they did not reveal a correlation between educator knowledge and student achievement outcomes. Rather, variation in student achievement at the Spring timepoint was predicted only by student achievement at the Fall timepoint, according to our model. Similarly, an analysis of variance revealed no significant relation between educators' participation in LETRS training and the percent of students who were at or above benchmark at the Spring 2023 timepoint (again, controlling for the percentage of students at benchmark in the Fall of 2022). This non-significant association between LETRS training and student achievement outcomes aligns with the PPS student achievement findings discussed earlier in this report. As with previous recommendations, we suggest providing more time for LETRS teachers to fully complete the training and fully integrate new techniques prior to looking for changes in student achievement.

## Evaluation Insights & Recommendations

- ◆ Educators who received LETRS training shared enthusiasm for the opportunity it gave them to enhance their knowledge and skill in reading instruction and to become better equipped to meet their students' learning needs. According to multiple data sources (i.e., LETRS pre- and post-tests, supplemental study findings, educator surveys and interviews), the training indeed had a positive impact on teacher knowledge and skill. Furthermore, educators agreed that compared to other literacy-related professional development, they not only enjoyed the LETRS training more but found it more useful and relevant. As implementation progressed, buy-in to the LETRS program across districts seems to have increased as well, with some educators sharing that they joined after hearing positive reactions from their colleagues.
- ◆ Despite the overriding positive reception of LETRS, educators shared (in surveys, focus groups, and interviews) that the time commitment presents a substantial challenge to completing the program. Educators often used nights and weekends to complete their training, and district points of contact sited time requirements as a likely cause of attrition from the program. One district (Reynolds) provided dedicated time for educators to spend on LETRS, which educators from that district noted as a strong area of support. Reynolds also gave educators the option of completing LETRS in four years (rather than two) but found that many participants struggled more on the four-year track and were now interested in completing at a faster pace.
- ◆ The topic of monetary compensation for LETRS training was an important one for many interview and focus group participants, which also came through in survey findings. Some districts (PPS, Centennial, and Reynolds) provided compensation to LETRS participants. Points of contact noted that additionally, some educators expressed interest in receiving a pay increase for completing the program, which presents challenges when the program is not tied to college credit. Finally, some educators had paid for the LETRS training upfront and expressed some uncertainty regarding the process of being reimbursed by their district. Going forward, it may be beneficial for districts to engage in even more detailed communication with perspective LETRS participants regarding what to expect, particularly in relation to financial types of support.
- ◆ Administrators and educators shared ideas and lessons learned related to strengthening the support offered to LETRS participants. Administrators from several districts agreed that educators who were able to participate in the LETRS training with colleagues benefitted from going through the training with group support. Additionally, the three districts whose educators received coaching support (Centennial, DDS, and Reynolds) found that support to be valuable. Some administrators suggested that, in the future, PLCs, accountability groups, or partners may promote better experience, more program endurance, and greater application of the training into practice. Notably, all interviewed district administrators agreed that they would like to continue to provide LETRS training to their educators.
- ◆ According to survey results, educators perceived that their application of the LETRS training into their work had positively impacted the literacy outcomes of their students. In educational

intervention research, it is extremely rare to find evidence of student achievement outcomes associated with teacher professional development in less than 2 years. Nevertheless, findings on student achievement show some promising outcomes for students of LETRS teachers, compared to their peers. In particular, statistical analyses found that students of LETRS trained teachers in DDSD were 1.71 times more likely to have a Spring reading composite score at or above benchmark compared to students of non-LETRS trained teachers. Further, this finding held true for important subgroups, in that both ELL students and HU students at DDSD were more likely to have a reading composite score that was at or above benchmark compared to ELL and HU students of non-LETRS trained teachers. It is important to note that the impact of LETRS training was the most pronounced for students in the kindergarten grade-level, suggesting that the influence of LETRS informed teaching on student success may be highly meaningful for younger students.

# **Appendix A. Literature Review**



*A Review of the Literature on*  
Language Essentials for Teachers of Reading  
and Spelling (LETRS)



Prepared by:  
Pacific Research and Evaluation, LLC  
October 2022

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# INTRODUCTION

Language Essentials for Teachers of Reading and Spelling (LETRS) is a professional learning program for early childhood educators and administrators focused on early literacy and language foundations. Over a two-year period, participants engage in online units, face-to-face sessions, readings, and dedicated time to practice applying skills in the classroom, with learning measured by quizzes, tests, and document submission. Within Multnomah County, five districts have begun investing in LETRS training, including Portland Public Schools, Reynolds School District, David Douglas School District, Parkrose School District, and Centennial School District. In partnership with the Multnomah Education Service District (MESD), Portland Public Schools received funding from the Oregon Department of Education to support implementation of LETRS across these five districts, in addition to an independent study of LETRS implementation and outcomes. Ultimately, the study aims to provide information that supports state-level decisions about whether and how to invest in LETRS training statewide. Pacific Research and Evaluation was selected through a competitive bid process to complete the independent study, which includes in its scope the current literature review.

## *Purpose and structure of this review*

The purpose of this comprehensive review is to summarize and interpret the current body of literature related to the utilization, implementation, and impact of LETRS training. This literature review provides information and background for the formative and summative evaluation of LETRS across the five identified school districts in MESD and will support the contextualization of findings at the end of the study period. To increase relevance and applicability to the five districts included in this study, this review focuses to the extent possible on literature produced in the past decade and involving schools in urban locations. Where available, this review highlights the findings and conclusions drawn from peer-reviewed empirical studies. However, as discussed further in the conclusion of this review, there is a paucity of empirical literature examining LETRS; therefore, recent scientific literature is supplemented by older works as well as other sources, including reports, press releases, and other non-peer-reviewed articles.

This review begins with an overview on the science of reading, including theories and seminal work that form the foundational principals of LETRS, as well as a brief summary of the longstanding debate known as the 'reading wars.' Next, findings related to the impact of LETRS are presented. This review concludes by considering limitations and future directions for research and evaluation, as well as the types of additional supports for teachers that may complement LETRS training.

The LETRS program is one, but not the only, professional training that uses the science of reading as its foundation; however, it was beyond the scope of this review to explore the



literature around additional professional development programs. For more information on available options, refer to the National Council on Teacher Quality's action guide for states (2020).

## SCIENCE OF READING OVERVIEW

Scientific inquiry into early reading development spans many decades and constitutes a vast and multi-faceted body of research, an important segment of which is summarized in the oft-cited National Reading Panel Report from the National Institute of Child Health and Human Development (NICHD, 2000). The NICHD report, which was used to inform the No Child Left Behind Act of 2001 and the Reading First initiative, identified five components of effective reading instruction that the authors found to be repeatedly supported by research findings.

### *Five components of effective reading*

Since the publication of the NICHD report (2000) and the No Child Left Behind Act (2001), these five components have been increasingly referenced in articles and material related to professional development (PD) for teachers of reading (for example, see: Jiban, 2022; National Council on Teacher Quality, 2020; Learning Point, 2004). The components are listed below, along with examples of how they appear in classroom instruction (Jiban, 2022):

- ◆ **Phonemic awareness** – developing students' understanding of the sounds made by spoken words
- ◆ **Phonics** – systematically mapping sounds of spoken words onto letters and letter combinations
- ◆ **Fluency** – providing extended reading practice to increase students' reading efficiency and lower the effort involved in word identification so that more mental energy can be devoted to understanding the meaning of the text
- ◆ **Vocabulary** – including ongoing, long-term vocabulary instruction, and teaching vocabulary words prior to assigning reading in order to build students' lexicons
- ◆ **Comprehension** – giving instruction that helps students develop their ability to construct reasonable and accurate meaning from text using background knowledge and context

These five components have become the central hallmarks of what has been termed the science of reading. More research released since the NICHD report has continued to point to the importance of these five factors in students' reading achievement (e.g., see McCutchen et al., 2009). Taken together, there is a strong body of evidence for their significance.

Much of the research supporting these components rests on several theoretical models that emphasize the importance of phonics in the development of literacy skills. Three of the most

influential models—the simple view of reading (Gough & Tunmer, 1986), Scarborough’s (2001) rope model of reading, and the four-part processing model (Seidenberg & McClelland, 1989)—are outlined below and covered extensively in the first module of the LETRS training (Moats, 2009).

*The simple view of reading*

The simple view of reading model describes reading comprehension as the product of decoding (or the ability to use phonics awareness to sound out words) and language comprehension (Gough & Tunmer, 1986). Moats cites the simple view of reading in LETRS training material, noting the multiplicative properties between decoding and comprehension which make both domains necessary and positively related to reading comprehension.

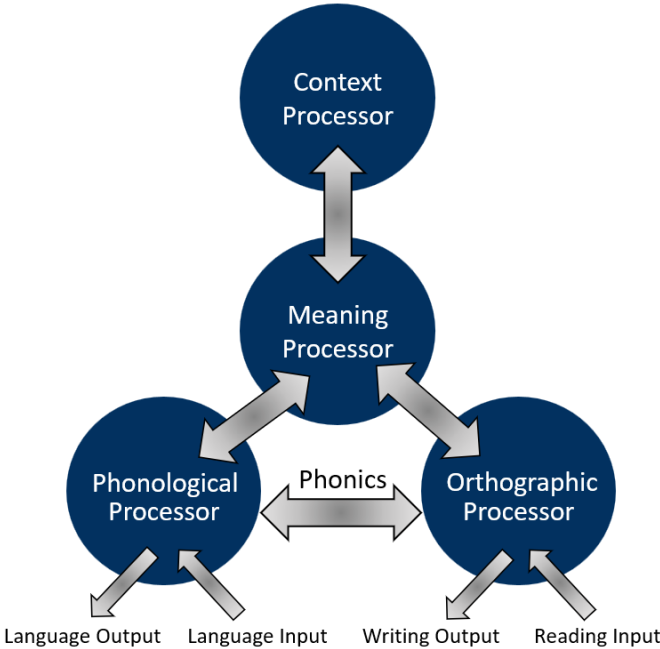
*Figure 1. Two domains of reading comprehension in the simple view of reading*



*The four-part processing model*

Another model that often arises in discourse on the science of reading is Seidenberg and McClelland’s (1989) four-part processing model (Figure 2), which describes the brain-processing systems involved in word recognition. The LETRS program extensively emphasizes the components of this model and explicitly focuses a number of its training modules on these processing systems as they relate to teaching and reading development. Moats explains that most reading disorders, including dyslexia, originate with a language processing weakness; therefore, providing teachers with the skills to identify and help students with processing challenges may be an important early intervention strategy (Moats, 2019).

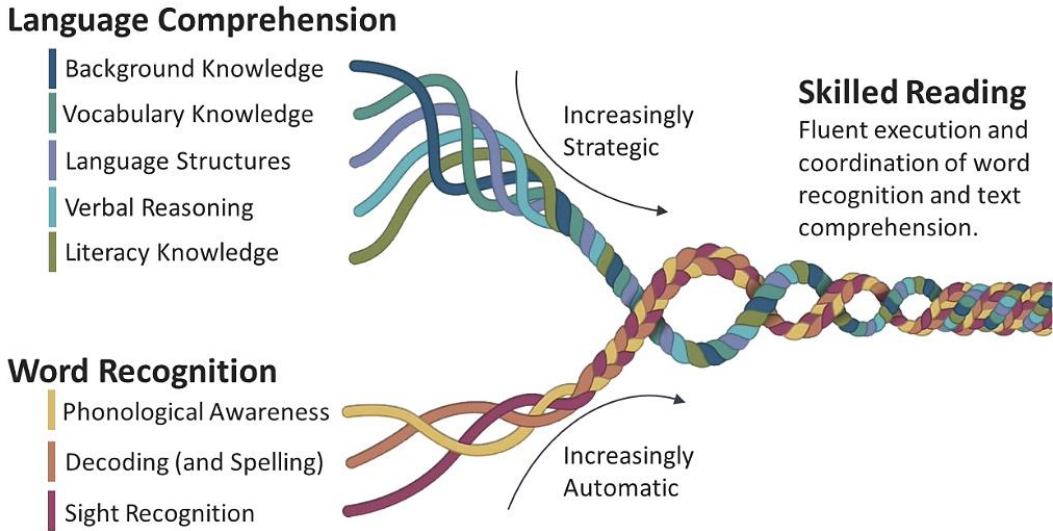
Figure 2. The four-part processing model for word recognition



**Scarborough’s reading rope**

A third notable model popular among science of reading advocates, including Moats, is Scarborough’s (2001) reading rope (Figure 3). Expanding on the simple view of reading, Scarborough proposed subsets of skills that contribute to each of the two domains of reading. Each skill can be thought of as a strand that together compose a ‘reading rope,’ with more and stronger skills contributing to stronger overall reading.

Figure 3. Scarborough’s Reading Rope



### *Debate and commentary on the science of reading*

The term 'science of reading' has long been closely associated with phonics and decoding, as far back as the 1830s (Shanahan, 2020). The debate over the science of reading is, at its core, a debate over how much or if phonics and decoding should be explicitly taught to emerging and early readers (Castles et al., 2018). Proponents of the argument opposite of science of reading support approaches that, to varying degrees, deemphasize phonics. For example, the whole language approach stresses the importance of repeated exposure to words and literacy-rich environments when it comes to reading development, and the value of reading comprehension at the text-level above and beyond the word-level (Goodman, 1967; Smith & Goodman, 1971). Whole language theorists suggest that reading is the result of a three-part cueing system in which readers take cues from context (e.g., surrounding words or sentence structure) as well as letter-sound knowledge to help them identify words, at times using some degree of guesswork (Watson, 1989; Smith, 2012).

While whole language and cueing-based reading approaches generally support some level of phonics instruction, they tend to be less systematically incorporated into lessons—a key crux of the debate over the science of reading (Semingson & Kerns, 2021). However, as LETRS founder Louisa Moats (2020) and other science of reading advocates assert, there is a preponderance of evidence to suggest that students who receive systematic phonics instruction learn to read faster, more fluently, and with higher comprehension compared to students who do not (Dehaene, 2011; Ehri et al., 2001; NICHD, 2000). For them, it is 'settled science,' and the debate is over.

### *Translating the science of reading into policy and practice*

Unfortunately, some highly publicized attempts to translate this body of research into policies and practice have not been as well executed or as effective as hoped. For example, the No Child Left Behind Act of 2001 has been widely criticized for the constraints it put on teachers' ability to make use of their individual expertise and creativity, pushing them instead to 'teach to the tests' and to use scripted, drill-oriented instructional methods, which many teachers perceived to have a negative impact on students' motivation to read and write (Powell et al., 2009).

Perhaps most discouraging is that, despite the collective interest in improving literacy among school-aged children, and the investment of a great deal of resources and time, reading proficiency has remained stagnant and even declined in many states (US Department of Education, 2019). According to 2019 reading assessment data from the US Department of Education, only 35% of fourth graders and 34% of eighth graders were proficient readers. In 17 states, reading proficiency for fourth graders significantly decreased between 2017 and 2019. Only one state, Mississippi, saw significant reading improvement among fourth graders in that

same period (US Department of Education, 2019). Notably, teachers in Mississippi have been receiving universal LETRS training since 2014, thanks to a science of reading bill passed by state legislatures the previous year (Mississippi Department of Education, 2021). Additional information and data from this statewide implementation are included in the Impact of LETRS section that begins on the next page of this review.

Promoters of reading reform today call for more teacher autonomy, combined with PD that supports teachers in gaining the science-based knowledge that they need to more effectively teach reading (Moats, 2020). While traditional teacher education programs (i.e., undergraduate and graduate programs for teachers) have begun adopting more coursework that aligns with the science of reading, it remains far from a universal practice among institutions (National Council on Teacher Quality, 2020), and does little to address gaps in veteran teacher knowledge. For years, experts have been warning that the majority of teacher preparation programs do not thoroughly prepare teachers to help students develop all of the essential skills for reading (Brady et al., 2009; Joshi et al., 2009a; Joshi et al., 2009b; Walsh et al., 2006). These apparent gaps in teacher education are a main focus of what LETRS (and other similar PD programs) aims to address (Hejtmanek, 2021).

## THE IMPACT OF LETRS

As previously mentioned, the LETRS program is a PD program for teachers. LETRS is not a curriculum, but it is designed to provide teachers with the knowledge and skills to more successfully use curricula that are based on the science of reading in their classrooms. Teachers with more foundational reading and writing knowledge (e.g., regarding phoneme awareness, phonics, etc.) are more likely to instruct students on those essential foundational skills (Cunningham et al., 2004), which supports all developing readers, especially those who are struggling (McCutchen et al., 2009). Therefore, the intended impact of LETRS can be thought of in two general ways: the direct impact on teachers (e.g., their knowledge, confidence, or the ways in which they teach); and the indirect impact on students (most notably, their reading and writing achievement).

### *Scientific evidence on the impact of LETRS*

This section presents research finding from two rigorous evaluations on the impact of the LETRS program. These studies stand out in the body of literature based on their specific focus on the LETRS training and its impact, as well as their use of research designs and methods that are scientifically founded. This review of the literature identified no other studies that met the same criterion.

**Overview of study & methods:** In 2014 the Mississippi Department of Education began providing LETRS training to K-3 teachers using online modules and face-to-face workshops, and provided literacy coaches in target schools with the lowest reading achievement scores based on statewide assessments. This study examined changes in Mississippi teachers' knowledge and competency, quality of instruction, and student engagement with literacy instruction between winter 2014 and fall 2015. To measure these outcomes, the authors developed and validated an evaluation tool called the Teacher Knowledge of Early Literacy Skills (TKELS) survey, as well as a classroom observation tool called the Coach's Classroom Observation Tool (CCOT). The TKELS was administered by the Mississippi Department of Education to kindergarten through third grade teachers statewide at four timepoints between winter 2014 and fall 2015; it was completed by 7,638 individual teachers, 40% of whom completed the survey at multiple timepoints. The CCOT was administered at four timepoints between winter 2014 and spring 2015 by literacy coaches in target schools only; it was used to observe the classrooms of 316 teachers, 80% of whom were observed at multiple timepoints.

**Outcomes - teacher knowledge:** Findings revealed that teacher knowledge of early literacy skills increased between the first to the fourth timepoint, rising from an overall score in the 48<sup>th</sup> percentile to the 59<sup>th</sup> percentile (based on a standardized distribution with an average of 50). Moreover, teachers who had completed the LETRS program were found to have significantly more knowledge of early literacy skills at the end of the study (ending in the 65<sup>th</sup> percentile) compared to teachers who had not yet started the LETRS program (this group scored in the 54<sup>th</sup> percentile at the final timepoint).

**Outcomes – teacher competency & quality of instruction:** Within target schools, average ratings of teacher competency increased between the first and the final timepoint, moving from the 30<sup>th</sup> percentile to the 44<sup>th</sup> percentile. Also within target schools, the average ratings of quality of early literacy instruction increased, rising from the 31<sup>st</sup> percentile to the 58<sup>th</sup> percentile. At the final study timepoint, teachers who had completed LETRS training were rated as significantly higher on competency and quality of instruction compared to teachers who had not yet started the training.

**Outcomes – student engagement:** Within target schools, average ratings of student engagement increased between the first and the final timepoint, from averaging in the 37<sup>th</sup> percentile to the 53<sup>rd</sup> percentile. At the final timepoint, student engagement was rated as significantly higher in the classrooms of teachers who had completed LETRS training, compared to those who had not yet started it.

**Limitations:** The authors acknowledge that the study design does not allow for causal inferences to be made. In other words, it is not known with certainty that the LETRS training or literacy coaching (versus other variables that were not controlled for) were the reasons that measured outcomes improved over the course of the study. The study also was not designed to take into account LETRS' impact on student reading or writing achievement outcomes.

**Additional notes:** Other sources have noted that Mississippi students' reading achievement increased more than any other state in the years since Mississippi teachers began widely receiving LETRS training (Hanford, 2019); however, these observations still do not offer causal evidence (Helms, 2021). It is also worth noting that in 2013 Mississippi was scoring much lower than other states for student reading proficiency, and the state's increase (which started trending upward even before 2013) has just begun to put them on par with national averages (Helms, 2021).

*Garet et al., 2008*

**Overview of study & methods:** This study assessed the impact of LETRS training and literacy coaching on second grade teachers' knowledge and instructional practices (based on the five components of reading from the NICHD report; 2000), and on their students' reading achievement. The sample consisted of 90 schools from six urban school districts in low-income areas. Schools were randomly assigned to one of three treatment groups (treatment A, treatment B, and a control group). Schools in treatment A implemented LETRS training with second grade teachers in the 2005-2006 school year; treatment B schools implemented LETRS training plus literacy coaching for second grade teachers the same year; and the control group continued 'business as usual' by providing their district's standard PD to second grade teachers.

Teacher knowledge was measured after the PD implementation phase using the Reading Content and Practices Survey (RCPS), which the authors developed for this study. A classroom observation tool measured reading instructional practices. Reading scores from district assessment records from 2004 to 2007 were used to assess student reading outcomes. Across schools, a total of 270 second grade teachers participated in this study during the implementation year; during the follow-up year, 250 and 254 teachers participated in data collection during the fall and spring, respectively.

**Outcomes - teacher knowledge:** Teachers in both treatment groups A and B scored significantly higher on reading knowledge measured at the end of the implementation year (spring 2006) compared to teachers in the control group.



**Outcomes - teacher instructional practice:** Classroom observations revealed that teachers in both treatment groups A and B used significantly more explicit reading instruction related to phonemic awareness, phonics, fluency, vocabulary and comprehension. No significant differences were found between groups when it came to two other types of instructional practices (i.e., independent student activity instruction, and differentiated instruction).

**Outcomes – student reading achievement:** Based on student reading assessment data, the authors of this study found no significant difference between any of the treatment groups when it came to student reading achievement. This null finding held both when looking at student achievement during the implementation year, as well as the year following. Although there were no significant differences in student achievement between the treatment groups, the study did reveal a significant positive association overall between teacher knowledge and student achievement scores.

**Limitations:** The authors suggest that student mobility could have limited the ability of this study to uncover significant results related to student achievement. At the end of the implementation year, 17% of enrolled students were ones that had not been enrolled at the beginning of the school year, meaning that they did not receive a full year of instruction from the same teacher or within the same school.

**Additional notes:** The impact of the LETRS and coaching treatment on teacher knowledge is encouraging, particularly when considered alongside the finding that teacher knowledge was positively associated with student achievement. It is possible that the effect of LETRS and coaching on teacher knowledge was not large enough to result in significant student achievement outcomes. This interpretation of Garet et al.'s findings, if accurate, would suggest that LETRS and coaching-based PD might be especially beneficial for teachers who are less knowledgeable about one or more of the five key reading components.

### ***Supplemental evidence***

Several other reports and articles related to the impact of LETRS were identified during this review process but were determined to be less relevant to the current study than those outlined above. Articles from this supplemental body of evidence are briefly presented below.

#### ***Preskitt & Ernest, 2020***

In 2018, Alabama began providing LETRS training to pre-K through third grade teachers. This non-peer reviewed evaluation report focused on the impacts of LETRS training in Alabama's pre-K classrooms. Findings indicated that LETRS-trained pre-K teachers had more positive teacher-child interactions and classroom quality (according to the CLASS,



or Classroom Assessment Scoring System) compared to a national comparison group. The study also found that children in LETRS classrooms showed more progress toward kindergarten readiness from the beginning of the school year to the end compared to the progress made by children in non-LETRS classrooms.

#### *North Carolina Department of Public Instruction, 2022*

This recent press release compared student reading proficiency data from kindergarten, first grade, and second grade students in North Carolina (NC) to data from 1.6 million students in other states (measured on the same reading assessment). Results revealed that NC students in each target grade level began the 2021–2022 school year with lower reading proficiency compared to students in other states but ended the school year at or above the national average (these were observed differences, not tested for statistical significance). Kindergarten students in NC in particular made impressive reading gains. At the beginning of the school year only 27% of NC kindergarteners scored at or above the national reading proficiency benchmark (compared to 36% of kindergarteners in other states), but by the end of the school year 67% of NC kindergarteners were at or above the benchmark (compared to 60% of kindergarteners in other states). These notable improvements come just a year after NC passed related legislation and began providing LETRS training to elementary and pre-K teachers statewide (see Fofaria, 2022). While promising, these results are observational and descriptive only and, as such, do not provide causal evidence of LETRS' impact.

#### *Carlisle et al., 2009*

This peer-reviewed study examined the relation between first through third grade teachers' knowledge about early reading with their students' improvement on word analysis and reading comprehension. Prior to the study, participating teachers received two types of PD, one of which was LETRS. This study did not differentiate the impact of one type of PD over the other on teacher knowledge. Teacher knowledge was assessed using the Language Reading Concepts test. Findings from this study regarding the association between teacher knowledge and student reading improvement were not significant. The authors suggest that a lack of alignment between the content of the LRC, the reading curriculums being used, and the assessment used to measure students' learning could have undermined their ability to find significance.

#### *Carlisle & Berebitsky, 2009*

This peer-reviewed study investigated the impact of literacy coaches on teacher and student outcomes. Teachers in this study were first grade teachers, all of whom received LETRS training the previous year. The study compared outcomes for 43 teachers who

received literacy coach support to 33 teachers who did not. Looking at changes from beginning of the school year to the end, findings revealed greater improvement on word decoding for students of teachers with literacy coaches compared to those without. Results suggest benefits of a model of PD in reading that includes school-based coaching for teachers of first grade.

## CONCLUSION

Overall, evidence for the impact of the LETRS training for teachers on their students' reading development is limited, but promising. Some results indicate that LETRS training increases teacher knowledge of core reading development processes and strategies (Folsom et al., 2017). Other studies have positively linked teacher knowledge in this domain with student reading achievement (Garet et al., 2008), although researchers investigating this association have not always established its significance (Carlisle et al., 2009).

Mississippi and North Carolina stand out as states that have implemented LETRS training widely and, soon after, recorded better than average improvements in students' reading proficiency scores (US Department of Education, 2019; Mississippi Department of Education, 2021; North Carolina Department of Public Instruction, 2022). However, the role of LETRS in those states' student achievement results has yet to be empirically established. It is also worth noting that prior to implementing LETRS, Mississippi and North Carolina were performing far below national averages for elementary students' reading proficiency (Helms, 2021; Fofaria, 2021). Therefore, it is not clear that the same results could be expected in states where student reading proficiency is already closer to the national average, or in classrooms of teachers who are already knowledgeable about the science of reading.

As LETRS training for teachers and administrators becomes more widely implemented, studies examining its impact in classrooms and communities with a variety of characteristics will be important additions to this body of research. Also, it may be helpful for researchers to explore whether the effects of LETRS on teachers' knowledge and performance varies based on teachers' previous exposure to science of reading (i.e., especially as colleges and universities continue to add more of a focus in this area for teacher preparation). Along the same lines, research on the effectiveness of different elementary reading curriculums, the use of school-based literacy coaches, and other potential resources and supports may reveal useful strategies for promoting the success of LETRS.

### *Strategies for supporting teacher success*

As LETRS implementation moves forward in Multnomah County, districts may want to consider additional strategies to support teacher success with the program. Fortunately, certain aspects

of the LETRS program already align with expert suggestions for making PD successful, such as incorporating opportunities for reflection and active learning (Darling-Hammond et al., 2017). Another recommended component of LETRS includes coaching to support teachers; this strategy is echoed by experts in the field of effective PD practices (Darling-Hammond et al., 2017) and has been incorporated into the proposed implementation plan to support teachers in Multnomah County. Perhaps most importantly, teachers need adequate time to complete the program, connect their learning to their classroom lessons, and to discuss what they are learning with other teachers. A research brief from the National Comprehensive Center for Teacher Quality (Archibald et al., 2011) provides some guidance around how schools can make more time for teacher PD, including setting aside hours each week by adjusting the amount of time used for other tasks (e.g., teacher planning or staff meetings). Finally, school leadership can play an important role by demonstrating that they support, prioritize, and are committed to PD for teachers (Bredeson, 2000).

## WORKS CITED

- Archibald, S., Coggshall, J., Coft, A., & Goe, L. (2011). High-quality professional development for all teachers: Effectively allocating resources. National Comprehensive Center on Teacher Quality Research & Policy Brief. Retrieved from <https://files.eric.ed.gov/fulltext/ED520732.pdf>
- Brady, S., Gillis, M., Smith, T., Lavalette, M., Liss-Bronstein, L., Lowe, E., ... & Wilder, T. D. (2009). First grade teachers' knowledge of phonological awareness and code concepts: Examining gains from an intensive form of professional development and corresponding teacher attitudes. *Reading and writing, 22*(4), 425-455.
- Bredeson, P. V. (2000). The school principal's role in teacher professional development. *Journal of in-service education, 26*(2), 385-401.
- Carlisle, J. F., & Berebitsky, D. (2011). Literacy coaching as a component of professional development. *Reading and Writing, 24*(7), 773-800.
- Carlisle, J. F., Correnti, R., Phelps, G., & Zeng, J. (2009). Exploration of the contribution of teachers' knowledge about reading to their students' improvement in reading. *Reading and Writing, 22*(4), 457-486.
- Castles, A., Rastle, K., & Nation, K. (2018). Ending the reading wars: Reading acquisition from novice to Expert. *Psychological Science in the Public Interest, 19*(1), 5-51. Retrieved from <https://doi.org/10.1177/1529100618772271>
- Cunningham, A. E., Perry, K.E., Stanovich, K.E., & Stanovich, P.J. (2004). Disciplinary knowledge of K-3 teachers and their knowledge calibration in the domain of early literacy. *Annals of Dyslexia, 54*, 139-167.
- Darling-Hammond, L., Hyler, M. E., Gardner, M. (2017). Effective Teacher Professional Development. Palo Alto, CA: Learning Policy Institute. Retrieved from <https://learningpolicyinstitute.org/product/teacher-prof-dev>
- Dehaene, S. (2011). The massive impact of literacy on the brain and its consequences for education. *Human neuroplasticity and education, 117*, 19-32.
- Ehri, L. C., Nunes, S.R., Stahl, S. A., & Willows, D. M. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's meta-analysis. *Review of Educational Research, 71*, 393-447.

- Fofaria, R. (2022, April 8). A year after enacting science of reading law, what's happening with literacy instruction? Education North Carolina. Retrieved from <https://www.ednc.org/a-year-after-enacting-science-of-reading-law-whats-happening-with-literacy-instruction/>
- Fofaria, R. (2021, October 6). Reading proficiency has tumbled in the early grades. Here's the DPI report, with steps to reform instruction. Education North Carolina. Retrieved from <https://www.ednc.org/2021-10-06-reading-proficiency-early-grades-nc-students-north-carolina-dpi-state-board-education/>
- Folsom, J. S., Smith, K. G., Burk, K., & Oakley, N. (2017). Educator Outcomes Associated with Implementation of Mississippi's K-3 Early Literacy Professional Development Initiative. REL 2017-270. *Regional Educational Laboratory Southeast*.
- Garet, M. S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., ... & Szejnberg, L. (2008). The Impact of Two Professional Development Interventions on Early Reading Instruction and Achievement. NCEE 2008-4030. *National Center for Education Evaluation and Regional Assistance*.
- Goodman, K. S. (1967). Reading: A psycholinguistic guessing game. *Literacy Research and Instruction*, 6(4), 126-135.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7(1), 6-10.
- Hanford, E. (2019, December 5). There is a right way to teach reading, and Mississippi knows it. The New York Times. Retrieved from <https://www.nytimes.com/2019/12/05/opinion/mississippi-schools-naep.html>
- Hejtmanek, D. (Guest). (2021, March 30). The science of reading: Why didn't we learn what we needed to know in college? [audio podcast episode]. In Voyager Sopris Learning. Retrieved from <https://www.voyagersopris.com/podcast/2021/the-science-of-reading-why-didnt-we-learn-what-we-needed-to-know-in-college>
- Helms, A. (2021, April 26). Some NC leaders say Mississippi's model charts the way to helping kids read. National Public Broadcasting, Charlotte, NC. Retrieved from <https://www.wfae.org/education/2021-04-26/some-nc-leaders-say-mississippis-model-charts-the-way-to-helping-kids-read>
- Jiban, C. (2022). The science of reading explained. The education blog of Northwest Evaluation Association. Retrieved from: <https://www.nwea.org/blog/2022/the-science-of-reading-explained/>

- Joshi, R., Binks, E., Graham, L., Dean, E., Smith, D., & Boulware-Gooden, R. (2009a). Do textbooks used in university reading education courses conform to the instructional recommendations of the National Reading Panel? *Journal of Learning Disabilities, 42*, 458–463.
- Joshi, R., Binks, E., Hougen, M., Dahlgren, M., Dean, E., & Smith, D. (2009b). Why elementary teachers might be inadequately prepared to teach reading. *Journal of Learning Disabilities, 42*, 392–402
- Learning Point (2004). A closer look at the five essential components of effective reading instruction: A review of scientifically based reading research for teachers. Naperville, IL: Learning Point Associates. Retrieved from: <https://files.eric.ed.gov/fulltext/ED512569.pdf>
- McCutchen, D., Green, L., Abbott, R. D., & Sanders, E. A. (2009). Further evidence for teacher knowledge: Supporting struggling readers in grades three through five. *Reading and Writing, 22*(4), 401-423.
- Mississippi Department of Education (2021). The Office of Elementary Education and Reading, Division of Literacy (website). Retrieved from <https://www.mdek12.org/Literacy>
- Moats, L. C. (2020). Teaching Reading "Is" Rocket Science: What Expert Teachers of Reading Should Know and Be Able to Do. *American Educator, 44*(2), 4. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1260264.pdf>
- Moats, L. (2019). Structured Literacy: Effective instruction for students with dyslexia and related reading difficulties. *Perspectives on Language and Literacy, 45*(2), 9-11. Retrieved from <https://www.idaontario.com/wp-content/uploads/2019/10/Moats-2019-Structured-Literacy-Effective-Instruction-for-Students-with-dyslexia-and-related-reading-difficulties.pdf>
- Moats, L. (2009). LETRS module 1, chapter 3: What the brain does when it reads. Boston, MA: Sopris West Educational Services. Retrieved from [https://cdn2.hubspot.net/hubfs/208815/2014-15\\_SchoolYear/LETRS/169261\\_Letrs2E\\_M1\\_29-38.pdf](https://cdn2.hubspot.net/hubfs/208815/2014-15_SchoolYear/LETRS/169261_Letrs2E_M1_29-38.pdf)
- National Council on Teacher Quality (2020). Program Performance in Early Reading Instruction. Teacher Prep Review. Retrieved from:

[https://www.nctq.org/dmsView/NCTQ\\_2020\\_Teacher\\_Prep\\_Review\\_Program\\_Performance\\_in\\_Early\\_Reading\\_Instruction](https://www.nctq.org/dmsView/NCTQ_2020_Teacher_Prep_Review_Program_Performance_in_Early_Reading_Instruction)

National Council on Teacher Quality (2020). The four pillars to reading success: An action guide for states. Retrieved from: <https://www.nctq.org/publications/The-Four-Pillars-to-Reading-Success>

NICHD (2000). Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

No Child Left Behind Act of 2001, P.L. 107-110, 20 U.S.C. § 6319 (2002).

North Carolina Department of Public Instruction (2022, August 25). NC early grade student make strong gains in literacy skills, assessment shows. [Press release]. Retrieved from <https://www.dpi.nc.gov/news/press-releases/2022/08/25/nc-early-grade-students-make-strong-gains-literacy-skills-assessment-shows>

Powell, D., Higgins, H. J., Aran, R. & Freed, A. (2009). Impact of No Child Left Behind on curriculum and instruction in rural schools. *The Rural Educator*, 31(1), 19-28.

Preskitt, J. & Ernest, J. (2020). Language Essentials for Teachers of Reading and Spelling Professional Development Course for Early Childhood Educators Cohort 1 (Focus on Pre-K Teachers) Preliminary Evaluation and Outcomes. A report by the First-Class Pre-K Research Evaluation team. Retrieved from [https://children.alabama.gov/wp-content/uploads/2021/09/Cohort-1-EC-LETRS-Training-Eval-Report\\_FINAL.pdf](https://children.alabama.gov/wp-content/uploads/2021/09/Cohort-1-EC-LETRS-Training-Eval-Report_FINAL.pdf)

Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis) abilities: Evidence, theory, and practice In Neuman SB & Dickinson DK (Eds.), Handbook of early literacy research (pp. 97–110). NY: Guilford Press.

Seidenberg, M. S., & McClelland, J. L. (1989). A distributed, developmental model of word recognition and naming. *Psychological review*, 96(4), 523.

Semingson, P., & Kerns, W. (2021). Where is the evidence? Looking back to Jeanne Chall and enduring debates about the science of reading. *Reading Research Quarterly*, 56, S157-S169.

- Shanahan, T. (2020). What constitutes a science of reading instruction? *Reading Research Quarterly, 55*, S235-S247.
- Smith, F. (2012). *Understanding reading: A psycholinguistic analysis of reading and learning to read*. Routledge: New York.
- Smith, F., & Goodman, K. S. (1971). On the psycholinguistic method of teaching reading. *The Elementary School Journal, 71*(4), 177-181.
- US Department of Education (2019). The Nation's Report Card: Results from the 2019 Mathematics and Reading Assessments. Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress. Retrieved from [https://www.nationsreportcard.gov/mathematics/supportive\\_files/2019\\_infographic.pdf](https://www.nationsreportcard.gov/mathematics/supportive_files/2019_infographic.pdf)
- Walsh, K., Glaser, D., & Dunne-Wilcox, D. (2006). *What elementary teachers don't know about reading and what teacher preparation programs aren't teaching*. Washington DC: National Council for Teacher Quality.
- Watson, D. J. (1989). Defining and describing whole language. *The Elementary School Journal, 90*(2), 129-141.