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Educational Policy (CREP)

**The Efficacy of the Leveled Literacy
Intervention System for Students in Grades 3–5:**
Data Summary Report for Denver Public Schools
2015–2016





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The Efficacy of the Leveled Literacy Intervention System for Students in Grades 3-5: Data Summary Report for Denver Public Schools 2015-2016

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Executive Summary

This report summarizes the results of an efficacy study of the Leveled Literacy Intervention system (LLI) conducted by the Center for Research in Educational Policy (CREP) in Denver Public Schools (DPS) during the 2015-2016 school year. Developed by authors Irene C. Fountas and Gay Su Pinnell and published by Heinemann, LLI is a short-term, small-group, supplemental literacy intervention system that uses a series of “leveled” texts (i.e., texts of progressing difficulty) to help students in third through fifth grade achieve grade-level competency in literacy. There were three key purposes of this study: (1) to determine the efficacy of the Leveled Literacy Intervention system (LLI) in increasing literacy achievement for students in grades 3-5 and associated student subgroups; (2) to examine LLI program implementation fidelity in grades 3-5; and (3) to determine perceptions of the LLI system according to relevant stakeholders.

A total of 115 DPS students in grades 3-5 participated in this mixed-methods quasi-experimental study (QED) that included both quantitative and qualitative data. The students were matched demographically and assigned to treatment and control groups. During the study, the treatment group students participated in LLI (approximately 24 weeks), while the control group students could not receive LLI until after the study was over. The control students could receive other literacy interventions, however. Treatment and control group students’ pre- and posttest performance was compared on two measures of student literacy achievement: the Fountas & Pinnell Benchmark Assessment System, and their state’s reading assessment. Further, an assessment of LLI implementation fidelity included independent observations of LLI groups and teacher-provided data taken from the LLI Online Data Management System. The quality of the core literacy instruction was also examined using classroom literacy observations, and feedback regarding LLI and the participating schools’ core literacy programs was obtained from LLI teachers, classroom teachers, principals, parents/guardians, and independent site researchers who collected data for the study. Results from the current study are summarized by research question below.

1. What progress in literacy achievement, if any, do students who receive LLI in grades 3-5 make compared to students who receive core literacy instruction alone?

Results revealed that LLI positively impacts some 3rd-5th grade students’ literacy achievement. In particular, two of the three types of analyses showed important results: 1) when treatment and control group students were equivalent at baseline, and 2) when the control group had a baseline advantage. Positive effects were observed for several subgroups in DPS. While none of the findings were statistically significant, there were a number considered substantively important based on guidelines from the What Works Clearinghouse (WWC) (i.e., an effect size of +/- 0.25; What Works Clearinghouse, 2014). Detailed findings for each subgroup are presented in the body of this report; however, some of the strongest findings are outlined below.

With regard to **benchmark levels**:

- When equivalent at baseline, 4th grade white students in LLI showed substantively higher gains compared to control students.
- When starting at a disadvantage, 3rd grade low achieving students in LLI showed substantively higher gains compared to control students. This was also true for 3rd grade low achieving minority and economically disadvantaged students.
- Even when starting at a disadvantage, 4th grade high achieving minority students in LLI showed higher gains close to substantively important compared to control students.

With regard to state achievement scale scores in literacy:

- When equivalent at baseline, 4th grade low achieving students in LLI and 5th grade LLI students in general, as well as those also minorities, ELLs, or economically disadvantaged showed substantively higher gains compared to control students.
- When starting at a disadvantage, 4th grade ELL students in LLI showed substantively higher gains compared to control students.
- When starting at a disadvantage, 5th grade economically disadvantaged students in LLI, including those that were high achieving, as well as high achieving minority students showed substantively higher gains compared to control students.

With regard to state achievement proficiency in literacy:

- When starting at a disadvantage, 4th grade students in LLI overall, as well as various subgroups, such as Hispanic LLI students, showed substantively higher gains compared to control students.

2. At what level of fidelity to the program model is LLI implemented by teachers participating in the study?

Overall, the observation results from the current study suggest that LLI was implemented with good fidelity to design. When observed, the majority of lesson components received acceptable to high fidelity ratings, with very few indications of needing improvement. However, a few components went unobserved in over half of the observations. More generally, the majority of site researchers concluded that the lessons they observed were delivered as designed. Site researchers also had a favorable opinion in their open-ended comments, of which the large majority were positive and very few indicated areas needing improvement. Site researchers largely described the observed LLI instruction as rigorous and of high quality, including the pacing, organization, and adherence to LLI protocols, as well as including effective use of instructional strategies and lesson resources. Additionally, the observation results revealed that LLI implementation was consistent across the school year, with acceptable fidelity scores at both time points when the observations were conducted. Changes in implementation over the year generally indicated improvement, with a substantively important improvement literacy instructional strategies in third grade and in quality of implementation in 5th grade. However, there was a substantively important decrease in quality of implementation and learning environment for third grade as well, though no subscale was rated as needing improvement at either time point.

The observation results were complemented with self-report feedback from the participating LLI teachers, a majority of whom reported implementing LLI as designed (e.g., meeting daily for 45 minutes,

following the LLI Lesson Guide), understanding the LLI goals and procedures, and having sufficient training to implement LLI effectively. However, there was a decrease between Fall and Spring in how many teachers thought they had sufficient training to implement LLI and a thorough knowledge of how to implement LLI. Also, LLI teachers noted that they were often asked to do other tasks that conflicted with LLI lesson time and were not given the planning time necessary or support needed for LLI implementation. This may have impacted students' progress as seen in the overall achievement results.

Finally, the LLI attendance records that were available (90% of treatment group) from the current study revealed that the average number of days attended by the treatment group was just over the recommended number of LLI instructional days (i.e., approximately 90-120 days/18-24 weeks). Of these students with attendance data, when looking individually at each student, the data revealed that 51% of these students *did* receive the recommended dosage; however, the remaining 50% of LLI students *did not*. Student absences were due to several student-level factors (e.g., individual absences or unavailability during LLI group time) as well as school or district limitations (e.g., holidays, assessment windows during which LLI teachers and/or students were pulled during LLI group time, delays in starting LLI due to scheduling conflicts or difficulty accessing student data). Therefore, the findings at each grade level which are not meeting statistical significance or substantively important progress may have been impacted due to a large number of treatment students not receiving a full dosage of LLI. Schools should note the importance of consistently providing LLI throughout the year so the students can make the most progress by receiving, at a minimum, the recommended amount of LLI lessons.

3. What are stakeholders' perceptions of the LLI system for grades 3-5 and the core literacy program?

Overall, LLI teachers, classroom teachers, principals, parents/guardians, and site researchers shared positive perceptions of the LLI system and its impact on struggling students' literacy success. Stakeholders felt that LLI has benefits for students' literacy achievement and skills as well as their engagement in reading and writing. Stakeholders also reported positive perceptions of such aspects of the LLI system as its design, instructional components, and materials (particularly the lesson books). However, although stakeholders generally perceived LLI as helpful, there was common feedback regarding the need for improving the data management system used for LLI and the need to more thoroughly incorporate writing. In general, stakeholders discussed the need for more time to complete lessons, more staff in order to appropriately serve students, and better identification of different students for participation rather than targeting the same students all year.

Regarding the core literacy instruction, stakeholders' perceptions were mixed, with both positive and negative opinions. Stakeholders perceived that their schools are generally supportive of literacy and provide a high-quality learning environment conducive to learning. Further, stakeholders shared positive perceptions of the core literacy program's classroom materials. However, stakeholders agreed that the core literacy instruction also has areas of improvement. This included needing a new curriculum that is consistent for all grade levels, as different grade levels used different programs, an increased focus on comprehension, more materials for home and school, and the need to cover a greater range of skills.

The current study encountered several limitations that may limit the generalizability of the findings and that prevented researchers from obtaining adequate power to draw definitive conclusions. These limitations included primarily that the sample was not randomized, which, while not ideal for research, was a real-world constraint for obtaining districts that would participate in the study. Other limitations include that only a portion of the treatment group students received the recommended

amount of LLI instructional time and the acknowledgement that control group students were allowed to receive other supplemental literacy services besides LLI while they were participating in the study. However, despite these limitations, the current study found educationally meaningful, positive effects of LLI on students' literacy achievement when implemented with sufficient fidelity to the LLI model. Further, stakeholders in these districts – including teachers, administrators, and parents/guardians – were supportive of LLI and perceived positive benefits of the LLI system for their students. Altogether, the results from this study allow us to conclude that LLI positively impacts upper elementary students' literacy skills, particularly in 4th and 5th grades, and for minorities, ELL, and Economically Disadvantaged students as well as the lowest-level readers coming into LLI. These results also suggest that continued implementation of LLI would be beneficial in each of these three participating districts and offer an opportunity for research-based recommendations that may enhance the system, future research, and ultimately student achievement. A list of these recommendations – including items related to LLI design, implementation, and professional development, as well as future directions for LLI research – may be found in the main body of this report.

Introduction

This report summarizes the results of a multi-site efficacy study of the Leveled Literacy Intervention system (LLI) conducted by the Center for Research in Educational Policy (CREP) in Denver Public Schools (DPS). A small number of schools within this district have adopted the targeted, small-group implementation model of LLI with support from Heinemann consultants providing LLI professional development, along with continuing support and development provided by trained staff in the district. This report focuses on the implementation and impact of the LLI System for grades 3-5 in a sample of 3 elementary schools who voluntarily adopted the LLI system.

CREP is a State of Tennessee Center of Excellence, located at the University of Memphis, whose mission is to implement a research agenda associated with educational policies and practices in preK-12 public schools and to provide a knowledge base for use by educational practitioners and policymakers. Since 1989, the Center has served as a mechanism for mobilizing community and university resources to address educational problems and to meet the University's commitment to primary and secondary schools. Functioning as a part of the College of Education, CREP seeks to accomplish its mission through a series of investigations conducted by Center personnel, college and university faculty, and graduate students.

This study was designed to extend the findings of prior LLI research conducted by CREP regarding the efficacy of LLI in grades K-2 in rural, suburban, and urban settings. While the efficacy of LLI was established in the prior study for the students in these settings, additional research was needed to establish LLI's effectiveness in grades 3-5 across multiple settings. Reading is the tool for learning knowledge in the upper-grade classroom, which plays a central role for academic success across different subjects (Lubliner, 2004; Salinger, 2003). In the long run, without effective reading intervention, struggling upper-graders are likely to experience frustration and failure when they move into middle school and beyond (Lubliner, 2004).

Schools in both rural and urban areas often face challenges such as limited resources, issues related to student mobility and teacher retention, and students often come from high-risk neighborhoods into high-risk schools. Further, these at-risk school districts have a great need for research-based programs that clearly demonstrate a positive impact on student achievement. The goal of this study was to examine the extent to which participation in LLI influenced student literacy achievement and teachers' instructional practices in LLI. Additionally, this study was designed to determine the strengths and weaknesses of LLI according to relevant stakeholders.

Research Questions

There were three key purposes of this study: (1) to determine the efficacy of the Leveled Literacy Intervention system (LLI) in increasing literacy achievement for students in grades 3-5 and associated student subgroups; (2) to examine LLI program implementation fidelity in grades 3-5; and (3) to determine perceptions of the LLI system according to relevant stakeholders. The study used a mixed-methods design to address the following confirmatory and exploratory research questions:

1. What progress in literacy achievement, if any, do students who receive LLI in grades 3-5 make compared to students who receive core literacy instruction alone?

- a. Does the effectiveness of LLI vary by the following subgroups: English Language Learners, students with a special education designation, and ethnic minorities (i.e., African-American and Hispanic students)?
2. At what level of fidelity to the program model is LLI implemented by teachers participating in the study?
 3. What are stakeholders' perceptions of the LLI system for grades 3-5 and the core literacy program?

Method

The present study of the LLI system employed a mixed-methods quasi-experimental design that included both quantitative and qualitative data. A matched-pair design was utilized to assist in the equivalency between treatment and control groups, and pre-post comparisons of student achievement in literacy were conducted. In addition, an assessment of fidelity of implementation – including LLI and classroom observations as well as feedback from teachers, parents/guardians, school-level administrators, and independent site researchers – yielded both observational and self-reported data.

Multiple instruments were utilized in the study, including two measures of reading achievement for evaluating students' progress in literacy; two observational tools for assessing LLI and classroom teachers' instructional practices; and four surveys – along with two focus groups – to obtain feedback on LLI and the core literacy program from LLI and classroom teachers, parents/guardians, principals, and site researchers. Details of each instrument will be discussed later in this section.

Setting and Population of Participants

Three elementary schools in Denver Public Schools (DPS) in Denver, Colorado, volunteered to participate in the study. DPS is a large urban district that served 92,331 students and employed 4,329 teachers during the 2015-2016 school year. There are 199 schools in the district, including 93 elementary schools. The majority of students are Hispanic or White (55.5% and 23.2%, respectively), with over half of the students eligible for free or reduced lunch (68.5%). Additionally, one third of students are English Language Learners (36.8%). Table 1 summarizes the overall demographic characteristics of the district.

Table 1: Demographic Overview of DPS Schools for the 2015-2016 School Year

Grade Levels	District-Wide Population			District-Wide Student Demographics							
	Students	Teachers	Student/Teacher Ratio	% Asian	% Black	% Hispanic	% White	% Other	% Free/Reduced Lunch	% Special Education	% English Language Learners
ECE-12	92,331	4,329	21.1	3.2	13.4	55.5	23.2	4.0	68.5	11.0*	36.8

Source: DPS Communications Office (<http://communications.dpsk12.org/facts.html>)

*This information was obtained from the latest enrollment counts provided by the DPS Department of Planning and Analysis (<http://planning.dpsk12.org/enrollment-reports/standard-reports>).

Teacher Demographics

When asked to respond to a survey for LLI teachers, data was obtained from 14 participating LLI teachers. The majority of LLI teachers in the study taught 5th grade, followed by 4th grade, and then 3rd grade. Around half of the teachers had been at their current school for one to five years. Half had been teaching in general for 15 or more years. The majority of LLI teachers had acquired a regular/professional teaching certificate and half were fully trained in LLI. All of the teachers were female, and the majority were White, followed by Hispanic. Overall, these teachers had a solid background of teaching experience at their current school and teaching in general. Taken together, they appear to have been well positioned to implement the LLI curriculum. Table 2 summarizes the demographic characteristics of the LLI teachers in the study, as reported on the LLI teacher survey.

Table 2: Demographic Characteristics of Participating LLI Teachers (n = 14)

Item	Percent Responded
Grade level(s) taught	
3 rd grade	31.3
4 th grade	37.5
5 th grade	52.1
Years of teaching experience at current school	
Less than 1 year	12.5
1-5 years	45.9
6-10 years	8.4
11-15 years	6.3
More than 15 years	27.1
Years of teaching experience at any school	
Less than 1 year	0.0
1-5 years	35.4
6-10 years	14.6
11-15 years	0.0
More than 15 years	50.0
Highest level of education completed	
Bachelor's degree	29.2
Master's degree	47.9
Master's plus 30 hours	14.6
Education Specialist degree	0.0
Doctoral degree	0.0
Ethnicity	
Asian or Pacific Islander	0.0
American Indian or Alaskan Native	0.0
African-American/Black	0.0
Hispanic	20.9
White, not of Hispanic origin	79.2
Multi-racial/Other	0.0
Gender	
Male	0.0
Female	100.0

Table 2: Continued

Item	Percent Responded
Age group	
29 years or less	20.9
30-39 years	6.3
40-49 years	37.5
50-59 years	29.2
60 years or older	6.3
Level of LLI training	
Completed training	75.0
Partially trained	0.0
None	25.0
Teacher certification level	
Paraprofessional	22.9
Alternative certificate	0.0
Initial/apprentice certificate	6.3
Regular/professional certificate	70.9

Note. Item percentages may not total 100% due to missing input or multiple responses from some participants.

Twenty-six DPS classroom teachers participated in the classroom teacher survey. According to data obtained from this survey, the classroom teachers in the current study primarily taught 4th grade, followed by 5th grade, and then 3rd grade. Roughly half of the classroom teachers had been at their current school between one and five years and slightly less than half had been teaching in general for one to five years. Further, over half held a master's degree or masters plus 30 hours, and the majority held a regular/professional teaching certificate. Almost all of the participating classroom teachers were female, and the majority were White or Hispanic. Overall, the participating classroom teachers were generally well-qualified and had a substantial amount of teaching experience. Table 3 summarizes the demographic characteristics of the 3rd-5th classroom teachers in the study, as reported on the classroom teacher survey.

Table 3: Demographic Characteristics of Participating 3rd-5th Grade Classroom Teachers (n =26)

Item	Percent Responded
Grade level(s) taught	
3 rd grade	17.3
4 th grade	45.5
5 th grade	34.3
Years of teaching experience at current school	
Less than 1 year	14.4
1-5 years	51.6
6-10 years	11.1
11-15 years	8.5
More than 15 years	14.4

Table 3: Continued

Item	Percent Responded
Years of teaching experience at any school	
Less than 1 year	8.5
1-5 years	42.5
6-10 years	20.3
11-15 years	14.4
More than 15 years	14.4
Highest level of education completed	
Bachelor's degree	42.8
Master's degree	28.8
Master's plus 30 hours	28.4
Education Specialist degree	0.0
Doctoral degree	0.0
Ethnicity	
Asian or Pacific Islander	0.0
American Indian or Alaskan Native	0.0
African-American/Black	0.0
Hispanic	37.3
White, not of Hispanic origin	57.2
Multi-racial/Other	5.6
Gender	
Male	3.0
Female	97.1
Age group	
29 years or less	25.8
30-39 years	51.4
40-49 years	11.5
50-59 years	0.0
60 years or older	11.5
Teacher certification level	
Paraprofessional	0.0
Alternative certificate	8.5
Initial/apprentice certificate	8.5
Regular/professional certificate	83.0

Note. Item percentages may not total 100% due to missing input or multiple responses from some participants.

Student Demographics

Treatment Group. Across the participating schools in DPS there were a total of 50 students who comprised the treatment group for the study. 64% of treatment students in the sample were Hispanic, 16% were Black, 12% were White, and 6% were of another or mixed ethnicity. Half of the students were female. In addition, 44% of the participating students were English Language Learners and 10% of students had a special education designation. Compared to the overall treatment group sample, DPS had a much higher English Language Learner population in part due to their high Hispanic population. Table 4 summarizes the demographic characteristics.

Table 4: Demographic Characteristics of Treatment Group Students (n =50)

District	Grade Levels	Students	% Asian	% Black	% Hispanic	% White	% Multi/Other	% Male	% Female	% English Language Learners	% Special Education	% Economically Disadvantaged
DPS	3-5	50	0.0	16.0	64.0	12.0	6.0	48.0	50.0	44.0	10.0	90.0

Source: DPS Department of Accountability, Research and Evaluation

Control Group. Across the participating schools in DPS, a total of 65 students were in the control group. Across the participating schools, 83.1% of control group students in the sample were Hispanic, 7.7% were White, 4.6% were Black, 1.5% were Asian, and 1.5% were of another or mixed ethnicity. Slightly over half of the students were female (53.8%). In addition, 64.6% of the participating students were English Language Learners and 9.2% of students had a special education designation. Compared to the overall control sample, DPS had a much higher English Language Learner population, in part due to their high Hispanic population. Table 5 summarizes the demographic characteristics overall and each district separately.

Table 5: Demographic Characteristics of Control Group Students (n =65)

District	Grade Levels	Students	% Asian	% Black	% Hispanic	% White	% Multi/Other	% Male	% Female	% English Language Learners	% Special Education	% Economically Disadvantaged
DPS	3-5	65	1.5	4.6	83.1	7.7	1.5	44.6	53.8	64.6	9.2	89.2

Source: DPS Department of Accountability, Research and Evaluation.

Instrumentation

Both quantitative and qualitative data were collected in this efficacy study. CREP researchers used three measures of reading achievement for evaluating students’ progress in literacy: the Fountas & Pinnell Benchmark Assessment System (BAS) was administered by local site researchers trained by CREP, while the state assessments in each district are routinely administered by the district each spring. Two observational tools developed by CREP – the Leveled Literacy Intervention Observation Tool (LLIOT) and the Literacy Observation Tool (LOT) – were used to evaluate LLI and classroom teachers’ literacy practices and instructional strategies in the classroom. CREP also developed two teacher surveys, the Leveled Literacy Intervention Teacher Questionnaire – Revised (LLITQ-R) and the Classroom Teacher Literacy Instruction Questionnaire (CTLIQ), as well as a principal survey (the Leveled Literacy Intervention Principal Questionnaire, or LLIPQ) and a parent/guardian survey (the Home Literacy Support Questionnaire, or HLSQ), to ascertain these stakeholders’ feedback on LLI and core literacy classroom instruction. Finally, structured focus groups were conducted with LLI teachers and site researchers to gather additional qualitative feedback regarding LLI. Details of each instrument are discussed below.

Student Literacy Achievement

Fountas & Pinnell Benchmark Assessment System (BAS)

The Fountas & Pinnell Benchmark Assessment System 1, 2nd Edition (2010) was used to measure the following literacy skills: phonemic awareness, letter-sound relationships (decoding), vocabulary, comprehension, fluency, and writing. Both treatment and control group students in the study were tested

by independent site researchers at the beginning and end of LLI. These data were used to measure individual student gains as well as the composition of the groups in respect to homogeneity of student needs.

The Fountas & Pinnell Benchmark Assessment System (BAS) is an individually administered assessment tool designed by the developers of LLI to reliably place students on the Fountas & Pinnell Text Level Gradient™ (Fountas & Pinnell, 2007), an A-Z gradient of text difficulty. LLI is comprised of three systems for upper elementary grades: Levels L-Q are in the Red System; Levels O-T are in the Gold System; and Levels R-W are in the Purple System. The Red System is generally used in 3rd grade, the Gold System in 4th grade, and the Purple System in 5th grade. The goal of the LLI system is to bring children up to their current grade level in reading, starting from the earliest Level A (usually mid-kindergarten) to Level W (early 4th grade). System 1 of the BAS, which is designed for students reading Levels A-N, and System 2 of the BAS, which is designed for students reading Levels L-Z, use both fiction and nonfiction texts to determine an independent and an instructional reading level for the student. The BAS demonstrates high test-retest reliability (0.97 overall), and convergent validity was established between the reading accuracy rates of BAS System 1 books and those of Reading Recovery assessment texts (0.94 for fiction, 0.93 for nonfiction; Heinemann, 2007). For BAS System 2 books, convergent validity was moderately established with the Slossen measure of word reading (0.69 for fiction, 0.62 for nonfiction) and the Degrees of Reading Power text passage reading assessment (0.44 for fiction, 0.42 for nonfiction; Heinemann, 2007).

State Assessments in Literacy

As a second measure of student literacy achievement, we also requested state assessment scores and proficiency levels in literacy from each of the three participating districts. In DPS, the CMAS (PARCC) is administered each Spring in grades 3-5, and we requested pretest (Spring 2015) and posttest (Spring 2016) scores in literacy for each participating 4th and 5th grade study student. Additional details and technical information on the CMAS assessment can be found on <https://www.cde.state.co.us/assessment/newassess-parcc>.

Intervention Fidelity

Leveled Literacy Intervention Observation Tool (LLIOT): Grades 3-5

The Leveled Literacy Intervention Observation Tool (LLIOT), developed by CREP researchers for a previous study of LLI, involves a targeted, 30-minute observation of an LLI group completing a randomly selected LLI lesson. The LLIOT is used to rate LLI teachers' fidelity to the LLI model as well as the quality of their literacy instructional strategies and the learning environment of the lesson. Ratings are provided using a 4-point scale that ranges from 0 (Not Observed) to 3 (Excellent). Containing 32 items, the LLIOT is comprised of three subscales: Quality of LLI Implementation (19 items), which is designed to measure LLI teachers' implementation of the 10 main LLI lesson components; Literacy Instructional Strategies (6 items), which is designed to assess LLI teachers' use of general teaching strategies that should be present in a successful literacy intervention; and Learning Environment (7 items), which is designed to assess the quality of lesson factors such as organization, pacing, and the availability of materials.

Site researchers trained by CREP conducted observations of two intervention sessions with each participating LLI group, one near the beginning of LLI and one near the end, using the LLIOT. This observation data contributed to the evaluation of fidelity to the LLI model and to gauge the level of

literacy instruction provided in these groups. To ensure the reliability of data, observers received a manual which provided definitions of terms, examples and explanations of target strategies, and a description of procedures for completing the instruments. Observers also received training on the instrument in a group session and monitoring by CREP researchers throughout the observations.

LLI Online Data Management System Intervention Record

The LLI Online Data Management System (ODMS) is a tool developed by Heinemann to allow teachers to enter and track data for their LLI groups and individual students, including demographic information, entry and exit benchmark scores, Weekly Reading Record scores, attendance, lessons completed, and current reading level. This data management tool allows teachers and administrators to create individual, group, or school-level reports to monitor students' progress. The Intervention Record in the ODMS was used for tracking student and teacher attendance, reasons for absence, student reading selections, and achievement levels. When possible, CREP utilized teacher-provided intervention records from ODMS to provide an additional measure of the LLI implementation fidelity at each school, particularly with regard to the 30-minutes-a-day, 5-days-a-week instructional cycle.

Quality of Core Literacy Instruction

Literacy Observation Tool (LOT)

The Literacy Observation Tool (LOT) was developed by researchers at CREP to serve as an instrument for observing in elementary classrooms where teachers are engaged in teaching reading and other literacy-related practices. The LOT has been aligned to the National Reading Panel and National Research Council findings. It captures explicit instruction in the five essential components of reading identified by the National Reading Panel as important in achieving effective reading instruction: Phonemic Awareness, Phonics, Fluency, Text Comprehension, and Vocabulary. Standard use of the LOT involves multiple classroom observations during a designated literacy block (typically 1.5 to 2 hours), with seven to nine classrooms each observed for 10 minutes. In a study of 70 schools across Tennessee, strong evidence was established for the reliability of the LOT, with a phi coefficient of .75 for five observations and .82 for eight observations at a school (Sterbinsky & Ross, 2003).

Twice during the 2015-2016 school year (once at the beginning and once at the end), site researchers trained by CREP conducted a set of seven to nine 10-minute LOT observations in the regular 3rd-5th grade classrooms at each participating school. Each set of observations was conducted in one day during the school's literacy block, and the ratings from the seven to nine individual classroom observations were combined to form a single LOT composite for that school. Therefore, the LOT was used to obtain a measure of the quality of the regular classroom literacy instruction received by students in the study by taking a "snapshot" of each school's core literacy instruction. To ensure that the identifying and coding of literacy instructional variables occurred in a consistent manner, observers received formal training, user's manuals, and monitoring by CREP researchers.

School and Home Support for Literacy

Leveled Literacy Intervention Teacher Questionnaire – Revised (LLITQ-R)

The Leveled Literacy Intervention Teacher Questionnaire – Revised (LLITQ-R), developed by CREP researchers for a previous study of LLI, was used in this study as a measure of the participating LLI teachers' views of the efficacy of LLI, their implementation of the LLI model, and their students' progress in literacy, as well as the overall support for literacy and LLI in their schools. The LLITQ-R consists of 23 items on a 5-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), five items on a 4-point scale ranging from 0 (Not at All) to 3 (Extensively), five items on a 5-point scale ranging from 0 (Not at All/Never) to 4 (Regularly/Every Day), and three open-ended items regarding LLI's strengths and areas for improvement as well as reasons to continue or not continue using the LLI system. The LLITQ-R was administered to participating LLI teachers at the beginning and end of the school year.

Classroom Teacher Literacy Instruction Questionnaire (CTLIQ)

The Classroom Teacher Literacy Instruction Questionnaire (CTLIQ), also developed by CREP for a previous study of LLI, was used in the current study to measure the overall support for literacy in the participating schools and the nature of the regular classroom literacy instruction received by the students in the study. The CTLIQ assessed 3rd-5th grade classroom teachers' self-reported literacy instructional practices and their perceptions of the core literacy program at their schools, as well as their perceptions of LLI. The CTLIQ consists of 24 items on a 5-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), five items on a 4-point scale ranging from 0 (Not at All) to 3 (Extensively), 10 items on a 5-point scale ranging from 0 (Not at All/Never) to 4 (Regularly/Every Day), and three open-ended items regarding the core literacy program's strengths and areas for improvement as well as reasons to continue or not continue the program. The CTLIQ was administered to 3rd-5th grade classroom teachers at the participating schools at the beginning and end of the school year.

Leveled Literacy Intervention Principal Questionnaire (LLIPQ)

CREP researchers developed the Leveled Literacy Intervention Principal Questionnaire (LLIPQ) for the current study as a measure of school support for literacy at the administrative level as well as principals' support for LLI specifically. The LLIPQ assessed principals' perceptions of their schools' core literacy program, their understanding of and familiarity with the LLI system, and their perceptions of LLI's implementation and efficacy at their schools. The LLIPQ consists of 26 items on a 5-point scale ranging from 0 (Strongly Disagree) to 4 (Strongly Agree) and three items on a 4-point scale ranging from 0 (Not at All) to 3 (Extensively). In addition, the survey contains five open-ended items designed to ascertain principals' perceptions of the strengths and areas for improvement of the LLI system, reasons to continue or not continue using the system, challenges to LLI implementation, additional resources needed, and efficacy of LLI in comparison with other supplemental literacy interventions at the principals' schools. The LLIPQ was administered to principals of the schools participating in the study at the end of the school year.

Home Literacy Support Questionnaire (HLSQ)

In order to measure the amount of support for literacy received by participating students at home, CREP researchers developed the Home Literacy Support Questionnaire (HLSQ). The HLSQ is a brief survey that asks parents/guardians (or other caretaking family members) about literacy activities in which their

child may engage at home, as well as their own involvement in and encouragement of these activities. Additionally, the HLSQ assesses respondents’ feedback on LLI, if applicable. The HLSQ is comprised of 14 items on a 5-point scale ranging from 0 (Strongly Disagree) to 4 (Strongly Agree) and two open-ended items regarding respondents’ perceptions of the strengths and areas for improvement of their child’s literacy instruction at school. The HLSQ was provided in both English and Spanish versions, and was administered to parents/guardians of both treatment and control group students in the study at the end of the school year.

Stakeholder Feedback

LLI Teacher and Site Researcher Focus Groups

Voluntary, structured focus groups were conducted with LLI teachers and site researchers at the end of the school year to provide more information about the overall climate for literacy instruction in the district as well as additional feedback on the LLI system. Participating LLI teachers responded to questions regarding LLI’s strengths and areas for improvement, the efficacy of LLI in meeting students’ needs, support within their schools for LLI, and their opinion of the LLI professional development they received. Finally, site researchers discussed their perceptions of LLI’s strengths and areas for improvement, students’ response to LLI, the quality of LLI and core literacy instruction received by students in the study, and their opinion of the training and use of the data collection instruments for the study.

Instrumentation Summary

Table 6 summarizes each of the research questions and the participants and provides the data sources and methodology used to investigate each question.

Table 6: Summary of Data Sources and Participants by Research Question

Research Questions	Participants	Data Sources	Method
1) What progress in literacy achievement, if any, do students who receive LLI in grades 3-5 make compared to students who receive core literacy instruction alone? a) Does the effectiveness of LLI vary by the following subgroups: English Language Learners, students with a special education designation, and ethnic minorities (i.e., African-American and Hispanic students)?	<ul style="list-style-type: none"> • LLI treatment and control students • LLI and classroom teachers • Principals 	<ul style="list-style-type: none"> • Fountas & Pinnell Benchmarks • State Assessments • LLI teacher survey (LLITQ-R) • LLI teacher focus group • Classroom teacher survey (CTLIQ) • Classroom literacy observations (LOT) • Principal survey (LLIPQ) 	<ul style="list-style-type: none"> • Quantitative assessments of student progress in reading achievement • Qualitative assessment of student progress through teacher and administrator feedback • Quantitative data regarding regular classroom literacy instruction

Table 6: Continued

Research Questions	Participants	Data Sources	Method
2) At what level of fidelity to the program model is LLI implemented by teachers participating in the study?	<ul style="list-style-type: none"> • LLI teachers • Site researchers 	<ul style="list-style-type: none"> • LLI observations (LLIOT) • LLI Online Data Management System Intervention Records • LLI teacher survey (LLITQ-R) • LLI teacher focus groups • Site researcher focus groups 	<ul style="list-style-type: none"> • Quantitative and qualitative assessments of LLI instructional strategies and delivery
3) What are stakeholders' perceptions of the LLI system for grades 3-5 and the core literacy program?	<ul style="list-style-type: none"> • LLI teachers • Classroom teachers • Parents/guardians • Principals 	<ul style="list-style-type: none"> • LLI teacher survey (LLITQ-R) • LLI teacher focus groups • Classroom teacher survey (CTLIQ) • Parent/guardian survey (HLSQ) • Principal survey (LLIPQ) 	<ul style="list-style-type: none"> • Quantitative and qualitative assessment of LLI teachers' perceptions regarding LLI's impact on their instruction and their students' literacy, as well as classroom teachers', parents'/guardians', and principals' perceptions of LLI and the core literacy program in general

Procedure

The current study extended from Fall 2014 through Fall 2016. In Fall 2014 and Spring 2015, CREP researchers worked with the sponsor to develop a research plan and select school districts as sites for the research. Three school districts, including DPS, agreed to participate and were chosen due to varying regional locations and student populations (i.e., a high percentage of ELL, minority, and economically disadvantaged students), and the established relationships with the sponsor and with LLI. Although the original study proposal included randomization of eligible students to treatment and control groups, this methodology was replaced with a quasi-experimental matched-pair design to better serve districts' needs. Participating districts agreed to deliver LLI as designed by the developers, allow the Fountas & Pinnell Benchmark Assessments to be administered to students in the study, and provide the researchers with individual student-level data (e.g., demographic information, district-selected state assessment scores).

In May and June 2015, CREP researchers conducted site visits in Denver, CO to meet with key district-level administrators as well as principals and teachers, when possible, at schools interested in participating in the study. The research team provided an overview of the study requirements and the incentives to participate, which included – for each school – a set of Fountas & Pinnell Benchmark Assessment Systems 1 and 2 (as needed), Heinemann professional development on the BAS and LLI, as well as a \$1500 per semester stipend, complimentary use of the LLI Online Data Management System, and a school-level report of results as requested by school principals. Although DPS had agreed to take part in the study, the district decided to allow schools to participate on a voluntary basis; therefore, following these initial meetings, a total of three schools elected to participate in Denver.

During Summer 2015, CREP researchers refined the existing data collection instruments, which were developed for a previous LLI study in 2011, obtained IRB approval for the study, and worked with district staff to identify school coordinators and site researchers to conduct ongoing local work for the study. One school coordinator was identified from the team of LLI teachers and instructional coordinators at each participating school to coordinate data collection activities with CREP and help ensure smooth LLI implementation. Additionally, site researcher applicants were selected from pools of local-area educators, primarily retired teachers in each district; these applicants formed teams of site researchers to collect data for the study (i.e., Fountas & Pinnell benchmarks, LOT and LLIOT observations) throughout the school year. In Denver, six site researchers were selected from the previous study, with four of the six serving as full-time site researchers and two serving as back-up researchers. The LLI District Coordinator from the previous study in Denver agreed to serve as a LLI District Coordinator for the present study.

During early Fall 2015, CREP researchers returned to each district to meet with district personnel, site researchers, and school coordinators in order to finalize the study timelines and logistics, including plans for pretesting students in the study on the Fountas & Pinnell benchmarks between late August and early October. The CREP research team also worked with Heinemann consultants and the district professional development teams to provide training to the site researchers and LLI teachers who would be participating in the study, which included the following: (1) two full days of LLI training for teachers and site researchers (a follow-up training day was conducted in each district according to district convenience); (2) a full-day training on the Fountas & Pinnell Benchmark Assessment System for LLI teachers and site researchers. Training for site researchers on the LLI and classroom observation tools (i.e., LLIOT and LOT) also occurred each day following the Heinemann-led training sessions. One Heinemann consultant conducted the LLI and benchmark trainings, while two CREP researchers conducted the observation trainings. In early Spring 2016, CREP researchers led refresher trainings for site researchers on the Fountas & Pinnell benchmarks and the LOT and LLIOT observations. These refresher trainings occurred prior to the second round of LLIOT and LOT observations and the benchmark post-testing.

At the beginning of the 2015-2016 school year, parental consent forms were distributed in each district to students in grades 3-5 who were preliminarily identified by classroom teachers as students who might qualify for the LLI study. The CREP research team also worked with the district coordinators/liasons and school coordinators to develop lists of students in grades 3-5 who were eligible to participate in the study. Selection criteria included students who would be able to receive delayed literacy intervention services if assigned to the control group, could receive instruction in English, were not known to demonstrate high absenteeism, were below grade level based on each district's state or district testing standards according to scores in Spring 2015. CREP researchers also worked with the district coordinator and school coordinators to obtain active consent from LLI and classroom teachers who would be taking part in the study.

Once eligible students were identified and parental consent was received, pretesting of these students with the Fountas & Pinnell benchmarks was conducted by the site researchers. Subsequently, CREP researchers and statisticians conducted a matched-pairs analysis to match students based on demographic characteristics (i.e., gender, ethnicity, ELL status, special education, and economically disadvantaged status), and Spring 2015 Fountas & Pinnell benchmark scores of instructional reading level. Students in the treatment groups were then placed in LLI groups by LLI teachers, and the planned 24 weeks of LLI instruction for students began. The starting date for LLI varied across the participating districts and schools due to varying school-year academic calendars, the length of time needed to identify eligible students, obtain consent, complete matching, administer the benchmarks, and organize and

schedule the LLI groups; however, all groups began LLI by October 2015. Posttests with the Fountas & Pinnell benchmarks for all students were completed in Spring 2016.

Consistent with LLI program recommendations, the LLI research period lasted for a minimum of 24 calendar weeks, excluding the two weeks that districts were out of session for the winter holidays and other holidays in each district. During this 24-week period, control group students did not receive LLI; however, they could receive it after the research period if they still needed it (e.g., according to teacher judgment or post-benchmark scores). Site researchers used the LLIOT to conduct two random observations of each LLI group, one in Fall 2015 and one in Spring 2016; additionally, they conducted the first set of LOT (classroom literacy) observations in Fall 2015. A series of partnered observations using the LLIOT were also conducted in groups (five site researchers and one CREP researcher) during the round of observations in Fall 2015, in order to allow an assessment of inter-rater reliability.

In Fall 2015 and Spring 2016, the school and district coordinators/district liaisons were asked to encourage all 3rd-5th grade LLI and classroom teachers with students in the study to complete the online LLI Teacher Questionnaire – Revised (LLITQ-R) or Classroom Teacher Literacy Instruction Questionnaire (CTLIQ), as applicable. Additionally, the principals at the participating schools were asked to complete the online LLI Principal Questionnaire (LLIPQ) at the end of the school year. CREP assisted in the online survey process by providing instructions and log-in information to all participants. CREP also distributed paper copies of the Home Literacy Support Questionnaire (HLSQ) to the school coordinators, who sent them home with both treatment and control group students. Parents/guardians could complete the survey and return it to the child’s school, where it was collected by the school coordinator, or return it directly to CREP via mail.

The CREP research team held end-of-year meetings with each district, including school coordinators, district coordinators/liaisons, participating LLI teachers, and site researchers to debrief them, discuss any remaining issues, and conduct structured focus groups. The purpose of the focus groups was to collect qualitative data related to the study, the LLI materials, and participants’ individual and collective views of LLI. CREP researchers also met individually with LLI teachers, as needed, to verify teachers’ group and student data taken from the LLI Online Data Management System and to request missing information. Finally, demographic and state assessment achievement data (i.e., Spring 2015 and Spring 2016 state assessment scores) were provided electronically for participating students by each district in Summer and Fall 2016.

Table 7 provides a summary of data collection procedures, including the instruments organized by type, a general timeline and description of the data collection process, and the number received for each instrument.

Table 7: Data Collection Summary

Type of Measure	Instrument	Timeline	Description
Student Achievement Measures	<ul style="list-style-type: none"> Fountas & Pinnell Benchmarks State Assessments (Literacy) 	<ul style="list-style-type: none"> September/October 2015 April - June 2016 Spring 2015 Spring 2016 	<ul style="list-style-type: none"> The Fountas & Pinnell Benchmarks were administered to all students in both treatment and control groups as a pretest in Fall 2015 and a posttest in Spring 2016. Both scale and proficiency scores in literacy were collected from each district for participating students in grades 4 and 5 for Spring 2015 and Spring 2016, for whom scores were available.
Observations	<ul style="list-style-type: none"> LLIOT LOT 	<ul style="list-style-type: none"> September/October 2016 March-May 2016 October/November 2016 March-May 2016 	<ul style="list-style-type: none"> Trained on-site researchers observed all 3rd-5th grade LLI groups twice--once in Fall 2015 and once in Spring 2016. Trained on-site researchers observed randomly selected 3rd-5th grade classrooms during the literacy block at the beginning and end of the school year.
Surveys	<ul style="list-style-type: none"> LLITQ CTLIQ LLIPQ HLSQ 	<ul style="list-style-type: none"> September/October 2015 & May/June 2016 September/October 2015 & May/June 2016 May/June 2016 May/June 2016 	<ul style="list-style-type: none"> Surveys were completed at the beginning and end of the school year to obtain feedback from LLI teachers and 3rd-5th grade classroom teachers. Surveys were completed at the end of the school year to obtain feedback from principals and parents/guardians.
Focus Groups	<ul style="list-style-type: none"> LLI Teachers Site Researchers 	<ul style="list-style-type: none"> September/October 2015 & May/June 2016 September/October 2015 & May/June 2016 	<ul style="list-style-type: none"> Focus groups were completed at the beginning and end of the school year to obtain qualitative feedback about LLI and students' progress from LLI teachers. Focus Groups were completed at the beginning and end of the school year to obtain qualitative feedback about LLI and students' progress from site researchers.

LLI Dosage: Number of Days of LLI Instruction

Across all participating schools, the number of LLI instructional days for LLI students from student attendance data was available for almost all (90%) of the treatment group (N = 45). For the students with LLI instructional days provided, treatment group students received, on average, 93 days of LLI instruction over the minimum of 24 calendar weeks between October 2015 and May 2016, with a range of 77 to 113 days of instruction.

The recommended amount of LLI instruction for 3rd-5th grade students, according to the LLI program guide, is 18-24 weeks (approximately 90-120 days). The average of 93 days of LLI instruction provided did meet these recommended amounts. However, it is also important to note from the student attendance data provided that approximately 50% of treatment students did not receive the recommended minimum of 90 days due to student-level factors (e.g., individual absences or unavailability during LLI group time) as well as school or district limitations (e.g., holidays, assessment windows during which LLI teachers and/or students were pulled during LLI group time, delays in starting LLI due to scheduling conflicts or difficulty accessing student data).

Results

The following section presents the results of the study, discussed in relation to each instrument and each grade level, as appropriate. First, a summary of the quantitative and qualitative results will be presented, and the conclusion section will further discuss these results as they pertain to each of the research questions in the present study.

Student Literacy Achievement

To determine whether LLI students' progress in literacy was statistically significantly or substantively different from that of their control group counterparts, analyses of pretest to posttest gains were conducted at Grades 3-5 with respect to three measures of literacy achievement: the Fountas & Pinnell Benchmark Assessment System (BAS), state literacy assessment proficiency levels, and state literacy assessment scale scores.

Benchmark Assessment (BAS)

At all three grades, benchmark gains were computed by obtaining a numeric equivalent for students' beginning and ending instructional levels (e.g., A = 1, B = 2, and so on) and then computing the difference between the posttest and pretest numeric scores. Students who scored below the lowest level, A, were assigned a level of "Pre-A" with a corresponding score of 0.

State assessment proficiency level

Gains on the state literacy assessments were computed based on students' proficiency level, recoded as a dichotomous variable (Proficient = 1, Not Proficient = 0) for the Spring 2015 administration (pretest) and Spring 2016 administration (posttest). In a manner similar to computing benchmark gains, Proficiency Level gains were derived by subtracting posttest from pretest "levels." However, students who were in the Proficient level for both Spring 2015 and Spring 2016 also received a gain score of one (1) as that was considered to be a positive outcome. While benchmark gain scores have a wider range of 27 (0 through 26), Proficiency Level gain scores have a much smaller range of only 3 (-1 through 1).

State assessment scale scores

In addition to the proficiency level, gains on the state literacy assessments were also computed on students' scale scores, which were derived by directly subtracting posttest from pretest scale scores.

For the three measures of literacy gains, differences between LLI (treatment) and control groups overall, and by various subgroups based on students' demographic characteristics, such as ethnicity, English Language Learner (ELL) status, Special Education status, and Economically Disadvantaged status, were compared within grade level via multiple analysis of covariance (ANCOVA) procedures, with no correction applied to the probability level of the statistical outcomes, as these analyses were regarded as exploratory. In addition, differences in gains at each grade level were explored by classifying students' based on their achievement level on the Fall 2015 benchmark as either (1) "Low-Achievers" (scoring **at or below** the median for the combined (i.e., both LLI and control) study sample on the Fall 2015 benchmark assessment) or (2) "High-Achievers" (scoring **above** the median for the combined study sample on the Fall 2015 benchmark assessment). Although both groups would be considered low achieving based on the fact

that they were receiving LLI, the “Low-Achievers” group closely relates to the benchmark level cut score for “Does Not Meet Expectations: Needs Intensive Intervention” (i.e., this group would be considered the “lowest of the Low-Achievers” so to speak). The mean gains for these groups were also statistically tested using ANCOVA procedures, with no corrections for multiple comparisons. The covariates in the ANCOVA models included dummy variables for Minority (i.e., non-White), ELL status, Special Education status, and Economically Disadvantaged status. A total of eight comparisons were made: All students, White, African-American, Hispanic, Minority, Special Education, Limited English Proficient, and Economically Disadvantaged.

In addition to testing for statistical significance, an effect size was calculated. As an indicator of the impact or “practical significance” of the treatment, the “effect size” (calculated as Hedges’ *g*) is a descriptive statistic that indicates the magnitude of the difference (in standard deviation units) between two measures. For example, a positive effect size would indicate a larger (i.e., better) LLI group gain, while a negative effect size would indicate a larger (i.e., better) control group gain. Based on the guidelines from the What Works Clearinghouse (WWC), a unit within the research division of the U.S. Department of Education, an effect size of +/- 0.25 is considered to be “substantively important” (i.e., educationally meaningful) (What Works Clearinghouse, 2014).

Three types of ANCOVA analyses were conducted for the current report, namely:

(1) when LLI and control group students had baseline equivalence (i.e., neither group had an advantage on the pretest) and LLI students demonstrated either statistically significantly and/or substantively larger gains compared to their control counterparts with respect to any of the three outcome measures;

(2) LLI students showed larger gains in outcomes despite control group students having a substantively important advantage at baseline; and

(3) when control group students had a substantively important baseline advantage and an advantage on the outcome, but the outcome difference favoring the control group was not substantively important.

(1) Baseline equivalence + LLI group outcome advantage

Table 8 presents the subgroups where LLI students demonstrated substantively larger growth with respect to two of three outcomes of interest relative to their control counterparts. Specifically, one subgroup showed substantively larger gains on benchmark level (BAS) gains:

- 4th grade White students ($g = 0.45$).

In addition, four Low-Achiever subgroups at 4th grade and three subgroups for the combined sample at 5th grade exhibited substantively larger gains on state Literacy Assessment scale scores:

- 4th grade Low-Achiever students ($g = 0.60$);
- 4th grade Low-Achiever Minority students ($g = 0.58$);
- 4th grade Low-Achiever English Language Learners ($g = 0.42$);

- 4th grade Low-Achiever Economically Disadvantaged students ($g = 0.57$);
- 5th grade aggregate [All Students] ($g = 0.49$);
- 5th grade Minority students ($g = 0.49$);
- 5th grade Hispanic students ($g = 0.62$).

It should be noted that the sample sizes in all cases were small or very small, and therefore may not be representative of LLI impacts.

Table 8: Control and LLI Gains: Students with Baseline Equivalence

Grade level	Student group	Control			LLI			F	p	g
		n	M	SD	n	M	SD			
Fountas & Pinnell Benchmarks										
4	White	5	2.10	0.55	6	2.58	1.21	0.605	0.462	0.45
State Achievement Scale Scores										
4	Low-Achievers	7	-0.84	27.67	12	14.24	21.65	0.903	0.508	0.60
	Low-Achiever Minority	7	-2.36	27.67	10	12.75	22.96	0.753	0.575	0.58
	Low-Achiever English Language Learners	5	5.18	30.84	6	18.18	26.64	0.147	0.928	0.42
	Low-Achiever Economically Disadvantaged	7	-1.30	27.67	10	13.81	23.68	0.942	0.473	0.57
	All	21	3.45	18.79	18	13.59	21.85	0.844	0.507	0.49
5	Minority	21	3.45	18.79	18	13.59	21.85	0.844	0.507	0.49
	Hispanic	19	2.73	17.51	15	15.14	21.82	1.073	0.388	0.62

Note: Cells shaded in gray have very small sample sizes, and results should be treated with caution. Effect sizes in red are substantively important (i.e., ≥ 0.25)

(2) Control group baseline advantage + LLI group outcome advantage

For some subgroups, LLI students showed larger gains despite control students having a substantively important advantage at the baseline (see). Here we define “larger” as being either substantively important and/or statistically significant, or simply larger without being either statistically significant or substantively important. For benchmark level (BAS) gains, 3rd grade Low-Achiever students showed substantively larger gains compared to control students ($g = 2.31$), and these 3rd grade Low-Achievers were also both Economically Disadvantaged and Minority students. In addition, 4th grade High-Achiever Minority students also showed larger gains relative to their control counterparts, and the gain difference was nearly substantively important ($g = 0.23$).

With regard to students’ proficiency level gains, only LLI students in 4th grade showed larger gains, but all of these gains were substantively important. The specific 4th grade subgroups demonstrating such results included:

- Aggregate [All Students] ($g = 0.58$);
- Minority students ($g = 0.58$);
- Hispanic students ($g = 0.72$);
- Economically Disadvantaged students ($g = 0.62$);
- Low-Achiever students ($g = 0.68$);
- Low-Achiever Minority students ($g = 0.64$);

- Low-Achiever English Language Learners ($g = 0.61$);
- Low-Achiever Economically Disadvantaged students ($g = 0.64$).

However, all sample sizes were small or very small, and therefore may not be representative of LLI impacts.

With regard to students' scale score gains, one 4th grade subgroup and three 5th grade subgroups showed substantively larger gains compared to their control counterparts:

- 4th grade English Language Learners ($g = 0.25$);
- 5th grade Economically Disadvantaged students ($g = 0.49$);
- 5th grade High-Achievers ($g = 0.62$);
- 5th grade High-Achiever Minority students ($g = 0.62$);
- 5th grade High-Achiever Economically Disadvantaged students ($g = 0.59$).

Table 9: Control and LLI Gains: Control Students with Baseline Advantage/LLI Students with Outcome Advantage

Grade level	Student group	Control			LLI			F	p	g
		n	M	SD	n	M	SD			
Fountas & Pinnell Benchmarks										
3	Low-Achievers	3	1.33	0.58	3	3.00	0.58	9.375	0.055	2.31
	Low-Achiever Minority	3	1.33	0.58	3	3.00	0.58	9.375	0.055	2.31
	Low-Achiever Economically Disadvantaged	3	1.33	0.58	3	3.00	0.58	9.375	0.055	2.31
4	High-Achiever Minority	11	1.45	0.93	3	1.69	1.16	0.109	0.748	0.23
State Achievement Proficiency Levels										
4	All	20	-0.06	0.22	15	0.08	0.26	3.555	0.069	0.58
	Minority	16	-0.08	0.25	11	0.03	0.00	3.232	0.086	0.58
	Hispanic	13	-0.11	0.28	9	0.05	0.00	4.001	0.062	0.72
	Economically Disadvantaged	16	-0.08	0.25	13	0.09	0.28	3.532	0.072	0.62
	Low-Achiever	7	-0.15	0.38	12	0.01	0.00	2.353	0.149	0.68
	Low-Achiever Minority	7	-0.15	0.38	10	0.01	0.00	2.185	0.165	0.64
	Low-Achiever English Language Learners	5	-0.20	0.45	6	0.00	0.00	1.750	0.227	0.61
	Low-Achiever Economically Disadvantaged	7	-0.15	0.38	10	0.01	0.00	2.185	0.165	0.64
State Achievement Scale Scores										
4	English Language Learners	8	6.29	24.60	7	13.24	27.45	0.107	0.954	0.25
5	Economically Disadvantaged	20	3.69	19.26	17	14.07	22.38	1.042	0.387	0.49
	High-Achiever	6	1.46	16.78	4	18.06	32.94	0.214	0.920	0.62
	High-Achiever Minority	6	1.46	16.78	4	18.06	32.94	0.214	0.920	0.62
	High-Achiever Economically Disadvantaged	6	3.02	16.78	3	19.63	38.97	0.279	0.839	0.59

Note: Cells shaded in gray have very small sample sizes, and results should be treated with caution. Effect sizes in red are substantively important (i.e., ≥ 0.25)

(3) Control group baseline advantage + control group outcome advantage

In addition to the two types of results reported above, there were also outcomes where control students had a substantively important advantage at the baseline, and also achieved larger gains than LLI students on the outcome, but the gain was not substantively important. This type of result would suggest that LLI students moved to close the achievement gap relative to their control counterparts, even though LLI students did not show better gains. However, based on the ANCOVA analyses, no subgroups in Denver demonstrated this type of outcome.

Summary

In looking at the three outcome measures:

- For the **Benchmark Assessment (BAS)**
 - The greatest number of outcomes were for low-achieving 3rd grade students, with a total of three, all of which were cases where the control group had a baseline advantage, but LLI students had an outcome advantage (All students, Economically Disadvantaged students, Minority Students).
 - There were no positive findings for 5th grade.
 - Across grade levels, Minority students had the largest number of positive findings ($n = 2$): 3rd and 4th grade Low-Achievers, and in both cases, the control group had a baseline advantage, but LLI students had an outcome advantage.
 - Across grade levels, the largest percentage of outcomes (4 out 5 or 80%) were those where the control group had a baseline advantage, but LLI students had an outcome advantage. In addition, all but one outcome was substantively important.

- For State Literacy Assessment **Scale Scores**
 - The strongest findings were for the 4th grade Low-Achievers, which had four positive outcomes (All Students, Economically Disadvantaged, Limited English Proficient, Minority). All outcomes had baseline equivalence and a substantively important LLI outcome. The combined sample in 5th grade also had four positive findings, three of which had baseline equivalence and a substantively important LLI outcome.
 - There were no positive findings for 3rd grade.
 - Across grade levels, All Students, Economically Disadvantaged students, and Minority students had the largest number of positive findings ($n = 3$ each). For both All Students and Minority students, two out of the three outcomes were cases with baseline equivalence and a substantively important LLI outcome (4th grade Low-Achievers and the 5th grade combined sample).
 - Across grade levels, the largest percentage of outcomes (7 out 12 or 58.3%) were those with baseline equivalence and LLI students having a substantively important outcome. Furthermore, all outcomes were substantively important.

- For State Literacy Assessment **Proficiency Levels**
 - The greatest number of outcomes were in 4th grade for both the combined and low-achieving samples, with a total of four each, all of which were cases where the control group had a baseline advantage, but LLI students had an outcome advantage. Both samples demonstrated positive outcomes for the same three groups: All students, Economically Disadvantaged, and Minority students.
 - There were no positive findings for either 3rd or 5th grade. In addition, all outcomes were substantively important.
 - Across grade levels, All students, Economically Disadvantaged, and Minority students each had the largest number of positive findings ($n = 2$ each), all with either the combined samples or Low-Achievers, and being cases where the control group had a baseline advantage and LLI students had a positive outcome.
 - Across grade levels, all outcomes (8 out of 8 or 100%) were cases where the control group had a substantively important advantage on the baseline and LLI students had a positive outcome. In addition, all outcomes were substantively important.

- Across the three outcomes
 - The largest number of positive outcomes was for scale scores ($n = 12/25$ or 48%), followed by proficiency levels ($n = 8/25$ or 32%), and benchmark levels ($n = 5/25$ or 20%). The largest percentage of positive outcomes for scale scores were cases where there was baseline equivalence and LLI students had a substantively important advantage on the outcome (7/12 or 58.3%).
 - More than two-thirds of positive outcomes (17/25 or 68%) were cases where the control group had a substantively important advantage on the baseline, but LLI students had a positive outcome.
 - Minority students had the largest number of positive findings (7/25 or 28%), followed closely by all students (6/25 or 24%) and Economically Disadvantaged students (6/25 or 24%). For all three groups, the largest percentage of positive outcomes (57.1%, 50%, and 50% respectively) were in 4th grade.
 - All outcomes ($n = 25$) had small sample sizes, which limits the generalizability of the findings.

Intervention Fidelity

Leveled Literacy Intervention Observation Tool (LLIOT)

Descriptive Results

The Leveled Literacy Intervention Observation Tool (LLIOT) involved a targeted, 30-minute observation of LLI implementation and instructional strategies ($n = 34$ observations). Table 10 illustrates the frequencies for each item on the LLIOT, as observed during the visits. The results from the LLIOT revealed that 6 of the 19 components were rated “Acceptable” or “Excellent” at least 70% of the time. The highest rated lesson components (i.e., demonstrating the highest degree of implementation fidelity) included reading a new book with guiding questions (73.5% Excellent, 26.5% Acceptable), reading a new book with students reading silently (50% Excellent, 35.3% Acceptable), reading a new book with assistance to students who need help (47.1% Excellent, 38.2% Acceptable), discussing and revisiting the text (41.2% Excellent, 38.2% Acceptable), revisiting yesterday’s book with a focus on comprehension (50% Excellent, 29.4% Acceptable), and phonics/word study (41.2% Excellent, 32.4% Acceptable). However, 6 of the 19 lesson components, those related to test preparation, were not seen in the vast majority of observations (97.1-100%). The lesson component that needed the most improvement was shared and independent writing (5.9%). Teachers were also rated highly (i.e., “Acceptable” or “Excellent”) on their use of literacy instructional strategies, such as emphasizing comprehension (100%), modeling use of appropriate strategies (100%), assisting students in problem-solving (100%), and engaging students in conversation about the text (97.1%). Further, teachers received particularly high ratings on the lesson being well organized, the teacher appropriately pacing lesson components, the teacher continually assessing student learning, and instructional materials needed being readily available. Observers perceived that the lesson was delivered as designed 85.3% of the time, and the average rating across all subscales of the LLIOT was 2.53 (i.e., between “Acceptable” [2] and “Excellent” [3]). All items can be found in Table 10 below.

Table 10: LLIOT Response Frequencies ($n = 34$)

Item	Percent Responded			
	Excellent	Acceptable	Needs Improvement	Not Observed
Quality of LLI Implementation				
Revisiting yesterday’s new book- Comprehension focus	50.0	29.4	0.0	20.6
Revisiting yesterday’s new book- Vocabulary focus	8.8	14.7	0.0	76.5
Revisiting yesterday’s new book- Fluency focus	20.6	11.8	0.0	67.6
Phonics/word study (e.g., vowel sounds, suffixes, plurality, etc.)	41.2	32.4	2.9	20.6
New book - Guiding questions	73.5	26.5	0.0	0.0
New book - Students read silently	50.0	35.3	2.9	11.8
New book – Assist students who need help	47.1	38.2	2.9	11.8
Discussing and revisiting the text	41.2	38.2	0.0	20.6
Rereading and assessment- Setting specific purposes	17.6	38.2	0.0	38.2
Rereading and assessment- Listens to one student read	26.5	23.5	0.0	50.0
Shared and independent writing	17.6	17.6	5.9	58.8
Classroom and homework	11.8	41.2	2.9	44.1
Use of prompting guide	14.7	8.8	0.0	76.5
Test preparation - Think together - Explain test	0.0	0.0	0.0	100.0

Table 10: Continued

Item	Percent Responded			
	Excellent	Acceptable	Needs Improvement	Not Observed
Test preparation – Think together – Recognize answer based on question	2.9	0.0	0.0	97.1
Test preparation- Have a try- Students read text	0.0	0.0	0.0	100.0
Test preparation- Have a try- Students identify main words	0.0	0.0	2.9	97.1
Test preparation- Have a try- Students organize thinking	0.0	2.9	0.0	97.1
Test preparation- On your own- Students read passage independently	0.0	2.9	0.0	97.1
Literacy Instructional Strategies				
Teacher models, encourages, and provides opportunities for fluent oral reading.	23.5	47.1	2.9	17.6
Teacher introduces vocabulary words (e.g., high frequency, story-specific words).	32.4	47.1	0.0	0.0
Teacher emphasizes understanding/comprehension of what is read.	70.6	29.4	0.0	0.0
Teacher models and encourages students to use appropriate reading strategies (e.g., phonemic awareness).	26.5	73.5	2.9	0.0
Literacy Instructional Strategies				
Teacher engages students in conversation about the text.	70.6	26.5	2.9	0.0
Teacher assists students in problem-solving.	32.4	67.6	0.0	0.0
Learning Environment				
Lesson is well organized.	73.5	26.5	0.0	0.0
Teacher appropriately paces lesson components.	52.9	47.1	0.0	0.0
Teacher engages in ongoing assessment of student learning (e.g., questioning, providing feedback/corrective instruction, checking responses).	64.7	35.3	0.0	0.0
Students are actively engaged.	70.6	26.5	2.9	0.0
Instructional modifications are observed when needed.	32.4	61.8	0.0	5.9
Instructional materials needed to implement lesson are readily available.	88.2	11.8	0.0	0.0
The lesson is delivered as designed.	55.9	29.4	14.7	0.0

Note. Item percentages may not total 100% due to missing input from some participants and because they are only implemented during even-numbered lessons.

The LLIOT also included items designed to describe the groups observed, which are summarized in Table 11. Results from these items indicated that observers most frequently saw 4th and 5th grade groups. All of the observed groups took place in a designated intervention area, and lasted between 35 and 50 minutes, which was consistent with LLI’s design. Further, just under half of the observed groups had four students, with most of the remaining groups having three students. Finally, there were more odd- than even-numbered lessons observed (58.8% and 41.2, respectively). All items can be found in Table 11 below.

Table 11: LLIOT Summary Items (n = 364)

Item	Percent Responded
Grade Level	
3	23.5
4	50.0
5	32.4
Location of Group	
Intervention Area	100.0
Classroom	0.0
Other	0.0
Number of Students in Group	
2	8.8
3	35.3
4	47.1
5 or more	8.8
Total Instructional Minutes	
Less than 35	0.0
35 – 50	100.0
More than 50	0.0
LLI Lesson Number	
Even	41.2
Odd	58.8

Note. Item percentages may not total 100% due to missing input or multiple responses from some participants.

Observers conducting the LLIOT also recorded open-ended comments summarizing the instructional materials used during the lesson and their perceptions of the quality of instruction, level of student participation, and overall success of the lesson. Observers' comments were summarized using a structured, multi-step process. First, the original comments were assigned codes representing their basic content. Next, these codes were grouped into categories, which were then organized into overarching themes. Final analysis produced frequency percentages for each theme. Because it was possible for some comments to contain multiple content codes, the percentages reported reflect the total number of codes within each theme and not necessarily the total number of comments received from observers. Observers' responses are summarized below by Fall 2015 and Spring 2016.

Fall 2015

In the Fall of 2015 for DPS, 56.3% of the comments were related to the quality of literacy instruction, 18.8% were related to the success of the lesson, 18.8% were related to student participation and engagement, and 6.3% were related to lesson resources and materials. The majority of these comments (81.3%) were positive in nature, while only 6.3% indicated areas needing improvement. Furthermore, 12.5% were neutral or descriptive in nature. In general, observers reported that the lessons were appropriately paced, well-organized, and delivered according to LLI guidelines. Comments were made that acknowledged teachers made effective use of such strategies as monitoring, questioning, prompts, and reinforcement; the students were actively engaged, motivated to learn, and enthusiastic, and a wide variety of instructional materials were readily available. However, in some lessons, observers noted poor time management or students off task. Sample comments from the observers are provided below.

“Very organized. Objective posted, all materials easily accessible; students worked independently well. Students focused. Lesson paced well. Teacher made connections with past readings. Teacher showed lots of pleasure and warmth toward teaching. In new book, guided students thru [sic] intro hitting comprehension, vocab, word attack, and parts of book. Teacher gave feedback to every child.”

“Students knew exactly what to do when they entered the room. It was obvious that high expectations were respected and valued. I observed effective well-paced lessons. It included a revisit of yesterday's book, word study of prefixes, shared writing with character web and reading a new book. Lesson ended with take home book.”

“The classroom showed evidence of multi-leveled literacy instruction. The teacher encouraged the 5th graders to think in advance terms and explain their reasoning with evidence from text. During word study students are encouraged to work cooperatively. Environment is conducive to learning!”

Spring 2016

In the Spring of 2016 for DPS, 43.8% of the comments were related to the success of the lesson, 25.0% were related to the quality of literacy instruction, 18.6% were related to lesson resources and materials, and 12.5% were related to student participation and engagement. The majority of these comments (56.3%) were neutral or descriptive in nature, while 37.5% were positive. Only 6.3% of comments were related to areas needing improvement. In general, observers reported that the lessons were appropriately paced, well-organized, and delivered according to LLI guidelines. The teachers made effective use of such strategies as monitoring, questioning, prompts, and reinforcement; the students were actively engaged, motivated to learn, and enthusiastic, and a wide variety of instructional materials were readily available. However, in some lessons, observers noted inadequate use of lesson resources, poor time management, and students off task. Sample comments from the observers are provided below.

“Very organized. Dictated sentences. Students engaged in lesson. Environment is inviting. Lesson well-paced. Teacher modeled on white board. Teacher and students had a good discussion about the book.”

“Reader's Theater: students struggled with multi-syllable words. No vocabulary or word attack skills before tackling the story. Good discussion about story sequence. New book-intro for comprehension was good. Only one vocabulary word was discussed.”

“Students warming up on test #146. The Disappearing Box-- Quick retell. Introduced New book #147. Did not have time to discuss book. Will do tomorrow. I did not see Phonics/ Word Work. Rereading of text #146 took 17 min.”

Consistency of LLI Implementation

The LLIOT was conducted at both the beginning and end of each LLI group containing at least one treatment group student in order to measure any changes in implementation over time. For third through fifth grades, pretest observations were conducted in Fall 2015, and posttest observations were conducted in Spring 2016. The 24 individual LLIOT items were divided into and analyzed as three subscales: Quality

of LLI Implementation (Items 1-11), Literacy Instructional Strategies (Items 12-17), and Learning Environment (Items 18-24), with each item rated on a three-point scale: Needs Improvement (1), Acceptable (2), and Excellent (3). For each subscale, a mean (i.e., average) across all of the items was calculated, and the means between the two time points tested via an independent *t*-test, as it was not possible to link individual observations across the two time points.

In addition to testing for statistical significance, an effect size was calculated. As an indicator of the impact or “practical significance” of the treatment, the effect size (calculated as Hedges’ *g*) is a descriptive statistic that indicates the magnitude of the difference (in standard deviation units) between two measures. For example, a positive effect size would indicate a higher (i.e., better) Spring 2016 mean, while a negative effect size would indicate a higher (i.e., better) Fall 2015 mean. Based on guidelines from the What Works Clearinghouse (WWC), a unit within the research division of the U.S. Department of Education, an effect size of +/- 0.25 is considered to be “substantively important” (What Works Clearinghouse, 2014). Results are summarized by grade level below.

Overall, it appears that LLI instruction remained consistently acceptable or improved throughout the program for students in grade levels 4 and 5, with substantively important improvement in quality of implementation for fifth grade and literacy instructional strategies in third grade. For third grade, there was substantively important decreases in quality of implementation and learning environment. It should be noted that no subscale was rated as needing improvement at either time point.

3rd Grade

The three independent *t*-tests that contrasted teacher behaviors at times one and two conducted on the set of means obtained on the LLIOT’s ten-item “Quality of LLI Implementation” scale ($t = 1.085, p = 0.320, g = -0.76$), its six-item “Literacy Instructional Strategies” scale ($t = -0.654, p = 0.537, g = 0.46$), and its seven-item “Learning Environment” scale ($t = 0.594, p = 0.574, g = -0.41$), showed substantively important differences. For both “Quality of LLI Implementation” and “Learning Environment”, there was a substantively important decrease in performance from pretest to posttest, while there was a substantively important increase in performance from pretest to posttest for “Literacy Instructional Strategies”. The average rating was between “Acceptable” (2.00) and “Excellent” (3.00) for each subscale at both time points (see Table 12).

4th Grade

The descriptive statistics and independent *t*-test results for each of the three LLIOT subscales for the fourth grade groups are presented in Table 12. There were no statistically significant or substantively important differences between the pretest and posttest observations for any of the three subscales: “Quality of LLI Implementation” ($t = -0.258, p = 0.800, g = 0.12$). “Literacy Instructional Strategies” ($t = -0.312, p = 0.760, g = 0.15$) and “Learning Environment” ($t = -0.180, p = 0.859, g = 0.09$). For all subscales, the average rating was between “Acceptable” (2.00) and “Excellent” (3.00) at both time points.

5th Grade

The results for the three independent *t*-tests for the fifth grade groups observed at the posttest revealed no statistically significant or substantially important improvement between the two sets of observations for the subscales “Literacy Instructional Strategies” ($t = 0.186, p = 0.856, g = -0.11$) and

“Learning Environment” ($t = 0.000, p = 1.00, g = 0.00$). Though not statistically significant, there was substantively import improvement for “Quality of LLI Implementation” ($t = -0.598, p = 0.564, g = 0.37$).

The average rating was between “Acceptable” (2.00) and “Excellent” (3.00) for each subscale at both time points. Descriptive statistics and independent t -test results are summarized in Table 12 below.

Table 12: Independent T-Test Results for LLIOT Subscales by Grade Level

Achievement Measure	Pretest			Posttest			t	p	g
	n	M	SD	n	M	SD			
Quality of LLI Implementation									
3rd Grade	4	2.57	0.23	4	2.41	0.20	1.085	0.320	-0.76^
4th Grade	9	2.45	0.38	8	2.50	0.32	-0.258	0.800	0.12
5th Grade	6	2.53	0.29	5	2.63	0.22	-0.598	0.564	0.37^
Literacy Instructional Strategies									
3rd Grade	4	2.44	0.27	4	2.54	0.15	-0.654	0.537	0.46^
4th Grade	9	2.35	0.28	8	2.39	0.26	-0.312	0.760	0.15
5th Grade	6	2.54	0.17	5	2.52	0.27	0.186	0.856	-0.11
Learning Environment									
3rd Grade	4	2.64	0.25	4	2.50	0.41	0.594	0.574	-0.41^
4th Grade	9	2.52	0.23	8	2.55	0.43	-0.180	0.859	0.09
5th Grade	6	2.71	0.31	5	2.71	0.36	0.000	1.000	0.00

* $p < .05$

^ Substantively important effect size (i.e., $g \geq 0.25$)

Quality of Core Literacy Instruction

Literacy Observation Tool (LOT)

Descriptive Results

The Literacy Observation Tool (LOT) involved seven to nine 10-minute observations of core literacy instruction in grades 3-5 during each school semester throughout the course of the study ($n = 4$ LOTs in Fall 2015 and $n = 3$ LOTs in Spring 2016). The LOT is designed to capture explicit instruction in the five essential components of reading: Phonemic Awareness, Phonics, Fluency, Text Comprehension, and Vocabulary. Whole group instruction was seen frequently or extensively during both observation time points. Learning environments that were conducive to cooperative interactions and that actively engaged students were also frequently or extensively observed during both time points, as were effective classroom management and teacher monitoring. Classroom libraries were also frequently noted by CREP observers during both semesters. However, although some of the literacy activities in the LOT are more frequently a part of literacy instruction in grades K-2 rather than grades 3-5, it is important to note that some activities within all five of the essential reading components were rarely observed or not observed at all during the Fall 2015 and Spring 2016 observations. This included learning centers, small group instruction, book/print conventions, all aspects of alphabetics, guidance in visual imaging, writing instruction, student writing, and most assessment strategies. Also, some materials were rarely or never used, such as basal texts, audio books, and worksheets. Table 13 illustrates the frequencies for each item on the LOT, as observed during the visits.

Table 13: LOT Response Frequencies

Literacy Observation Tool Data Summary (LOT) Items	% Rarely or Not Observed		% Occasionally		% Frequently or Extensively	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
Instructional Orientation						
Small group	75.0	100.0	25.0	0.0	0.0	0.0
Whole class	0.0	0.0	25.0	33.3	75.0	66.7
Learning centers	75.0	100.0	25.0	0.0	0.0	0.0
Cooperative/Collaborative learning	25.0	33.3	25.0	0.0	50.0	66.7
Concepts of Print						
Book/print conventions	100.0	100.0	0.0	0.0	0.0	0.0
Alphabets						
Letter naming/knowledge	100.0	100.0	0.0	0.0	0.0	0.0
Phonemic awareness instruction	100.0	100.0	0.0	0.0	0.0	0.0
Rhyming	100.0	100.0	0.0	0.0	0.0	0.0
Explicit phonics instruction	100.0	100.0	0.0	0.0	0.0	0.0
Fluency						
Models fluent oral reading	0.0	66.7	25.0	0.0	75.0	33.3
Has student(s) read/reread orally (together)	50.0	66.7	50.0	0.0	0.0	33.3
Vocabulary						
Introduces/reviews key vocabulary	25.0	66.7	50.0	0.0	25.0	33.3
Explicit vocabulary instruction	50.0	33.3	50.0	66.7	0.0	0.0
Text Comprehension						
Explicit comprehension strategy instruction	0.0	66.7	50.0	33.3	50.0	0.0
Makes connection to prior knowledge	50.0	33.3	25.0	33.3	25.0	33.3
Asks students for predictions	75.0	66.7	0.0	0.0	25.0	33.3
Uses higher level questioning	0.0	66.7	75.0	0.0	25.0	33.3
Guides visual imaging	100.0	100.0	0.0	0.0	0.0	0.0
Guides interactive discussion	25.0	33.3	25.0	0.0	50.0	66.7
Independent Reading - The Student:						
Reads self-selected materials	25.0	0.0	50.0	66.7	25.0	33.3
Writing - The Teacher:						
Letter formation/handwriting	100.0	100.0	0.0	0.0	0.0	0.0
Writing process	75.0	100.0	0.0	0.0	25.0	0.0
Language mechanics lessons	100.0	100.0	0.0	0.0	0.0	0.0
Conference with students	100.0	100.0	0.0	0.0	0.0	0.0
Provides for students sharing	100.0	100.0	0.0	0.0	0.0	0.0
Writing - The Student:						
Writes independently	75.0	0.0	25.0	66.7	0.0	33.3
Response writing	50.0	66.7	25.0	33.3	25.0	0.0
Assessment						
Formal testing	75.0	66.7	0.0	0.0	25.0	0.0
Portfolios	100.0	66.7	0.0	0.0	0.0	0.0
IRI, running records	100.0	66.7	0.0	0.0	0.0	33.3
Learning Environment						
Conducive to cooperative interactions	0.0	0.0	50.0	33.3	50.0	66.7
Students actively engaged	0.0	0.0	0.0	0.0	100.0	100.0
Effective classroom management	0.0	0.0	0.0	0.0	100.0	100.0
Teacher actively monitors	0.0	0.0	0.0	0.0	100.0	100.0

Table 13: Continued

Literacy Observation Tool Data Summary (LOT) Items	% Rarely or Not Observed		% Occasionally		% Frequently or Extensively	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
Visible Print Environment						
Alphabet	25.0	66.7	50.0	0.0	25.0	33.3
Word wall	0.0	33.3	75.0	33.3	25.0	33.3
Labeling (names, objects, areas)	50.0	33.3	25.0	0.0	25.0	66.7
Classroom library	0.0	0.0	0.0	0.0	100.0	100.0
Evidence of student writing/work products	50.0	33.3	0.0	0.0	50.0	66.7
Materials Used						
Basal texts	75.0	66.7	25.0	0.0	0.0	0.0
Big books	100.0	66.7	0.0	0.0	0.0	0.0
Books on tape	100.0	66.7	0.0	0.0	0.0	0.0
Computers	25.0	0.0	50.0	33.3	25.0	66.7
Fiction books	25.0	0.0	50.0	0.0	25.0	100.0
Non-fiction books	50.0	33.3	25.0	0.0	25.0	66.7
Materials Used						
Poetry	50.0	33.3	25.0	33.3	25.0	0.0
Newspaper/magazines	75.0	33.3	25.0	33.3	0.0	0.0
Word/vocabulary materials	75.0	33.3	25.0	0.0	0.0	33.3
Worksheets/workbooks	50.0	66.7	25.0	33.3	25.0	0.0
Materials Used - Other	25.0	0.0	50.0	33.3	25.0	0.0

There were notable changes across observation time points that are worth addressing. Interestingly, the observation of modeling fluent oral reading, introduction of key vocabulary, explicit instruction on comprehension strategies, use of higher level questioning and presence of an alphabet in the classroom dropped from Fall 2015 to Spring 2016. However, from Fall 2015 to Spring 2016, observation of independent student writing and labeling in the classroom environment, as well as use of some materials, such as fiction and non-fiction books, newspapers/magazines, and word/vocabulary materials, increased. Some of these changes could be attributed to the heightened focus on academic achievement tests during the spring semester. Given the increased pressure on student and teacher performance in educational settings over the past several years, teachers may be utilizing reading activities that they feel are most beneficial to student achievement on standardized tests as the testing season approaches, particularly during the spring semester.

Given the small number of comments provided, site researchers' open-ended responses for Fall 2015 and Spring 2016 are summarized in general by question below. Observers conducting the LOT noted comments related to the strengths and areas for improvement across the observed classrooms during their school visits, as well as notes on the students' progress and recommendations for next steps.

When asked to describe the strengths of the classroom literacy programs observed, site researchers mentioned seeing welcoming classroom environments that were conducive to learning. In addition, observers listed student engagement as another fundamental component when discussing strengths.

When asked to discuss concerns they had regarding the classroom literacy lessons that they observed, most site researchers' responses reflected the theme of general instructional strategies. One observer noted a lack of student writing, with the class lesson being only oral. Another observer mentioned not seeing direct reading instruction, while also noting that this may have been due to a school-wide focus on upcoming standardized assessments.

When asked to discuss student progress and next steps regarding the classrooms that they observed, site researchers mentioned that students were making progress and were engaged in reading. Site researchers commented that this progress could be attributed to the availability of daily independent reading and good instruction. One observer also mentioned that daily guided reading groups were occurring, though they were not directly observed.

Strengths

"Welcoming and friendly environment throughout school. Respectful, well behaved, and focused students. Overall good classroom management."

Concerns

"Unfortunately, I didn't see direct reading instruction. End of year activities and testing demands take precedent over regular classroom reading programs."

Next Steps

"Progress was evident using the BAS test results. Continue with LLI intervention and instruction."

School and Home Support for Literacy

Leveled Literacy Intervention Teacher Questionnaire – Revised (LLITQ-R)

The Leveled Literacy Intervention Teacher Questionnaire – Revised (LLITQ-R) was administered online to LLI teachers as a general measure of their implementation and perceptions of LLI in Fall 2015 ($n=6$) and Spring 2016 ($n=8$). Table 13 illustrates the frequencies of responses for each item on the LLITQ-R.

Overall, LLI teachers at both time points were most likely to "Agree" or "Strongly Agree" that all children can learn to read and write (100% each time point), there is ongoing communication between LLI and classroom teachers (100% each time point), they understand the goals of LLI (100.0% in the Fall and 87.5% in the Spring), their school should continue the LLI program (100.0% in the Fall and 87.5% in the Spring), and LLI has positively impacted participating students' literacy achievement (100.0% in the Fall and 87.5% in the Spring). However, LLI teachers at both time points were most likely to "Disagree" or "Strongly Disagree" that their students' parents participate in LLI home literacy activities with their child(ren) (50% in the Fall and 25% in the Spring) and that administration protects the time needed for LLI teaching (33.3% in the Fall and 37.5% in the Spring).

Through their responses, participants suggested differences between Fall 2015 and Spring 2016 regarding LLI implementation and perceptions of the LLI program. A lower percentage of LLI teachers indicated that they received adequate professional development for implementing LLI (100% in the Fall, 50% in the Spring), they had a thorough understanding of how to implement LLI (100% in the Fall, 50% in the Spring), that instructional materials were readily available (100% in the Fall, 62.5% in the Spring), and that LLI training had improved their reading instruction (100% in the Fall, 50% in the Spring). In addition, a higher percentage “Disagreed” or “Strongly Disagreed” that their school had sufficient faculty and staff to provide LLI to all students who needed it (16.7% in the Fall, 50% in the Spring). There was also a decrease in the percentage of LLI teachers who believed that their school and district supported them as an LLI teacher (100% in the Fall, 65% in the Spring for the school, 66.7% in the Fall, 12.5% in the Spring for the district). All items can be found in Table 14 below.

Table 14: LLITQ Response Frequencies (Fall 2015 *n* = 6, Spring 2016 *n* = 8)

Item	Percent Responded					
	Strongly Agree/Agree		Neutral		Disagree/Strongly Disagree	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
I understand the goals of the Leveled Literacy Intervention (LLI) program.	100.0	87.5	0.0	0.0	0.0	12.5
I have received adequate professional development for implementing LLI.	100.0	50.0	0.0	12.5	0.0	37.5
I have a thorough understanding of how to implement LLI.	100.0	50.0	0.0	12.5	0.0	25.0
Guidance and support are provided by our instructional and administrative staff to help us implement LLI.	66.7	50.0	16.7	25.0	16.7	25.0
I believe LLI has positively impacted LLI students' literacy achievement.	100.0	87.5	0.0	12.5	0.0	0.0
LLI teachers are given sufficient planning time to implement the program.	50.0	50.0	33.3	25.0	16.7	25.0
Students who receive LLI in this school are more enthusiastic about reading, writing, and learning because of LLI.	83.3	87.5	16.7	12.5	0.0	0.0
Our school has sufficient faculty and staff to provide LLI to all students who need the intervention.	50.0	37.5	33.3	12.5	16.7	50.0
Our administration protects the time needed for daily uninterrupted LLI teaching.	66.7	37.5	0.0	25.0	33.3	37.5
Our students' parents participate in LLI home literacy activities with their child(ren).	33.3	25.0	16.7	50.0	50.0	25.0
Teachers in this school are generally supportive of LLI.	100.0	87.5	0.0	0.0	0.0	0.0
Ongoing communication exists between LLI teachers and classroom teachers.	100.0	100.0	0.0	0.0	0.0	0.0
LLI teachers are encouraged to communicate concerns, questions, and constructive ideas regarding the program to school staff or administration.	50.0	75.0	50.0	25.0	0.0	0.0
LLI allows for teachers to provide differentiated instruction to address the varying strengths and needs of students.	100.0	87.5	0.0	12.5	0.0	0.0
Instructional materials (books, assessments, and other resources) needed to implement LLI are readily available.	100.0	62.5	0.0	12.5	0.0	25.0
The faculty, staff, and administration in my school believe that all children can learn to read and write.	100.0	100.0	0.0	0.0	0.0	0.0
LLI is aligned with state and district reading and language arts standards.	83.3	75.0	0.0	0.0	16.7	25.0
LLI training has improved my reading instruction.	100.0	50.0	0.0	25.0	0.0	25.0
LLI students perform better on state assessments as a result of their participation in LLI.	66.7	50.0	16.7	25.0	16.7	25.0

Table 14: Continued

Item	Percent Responded					
	Strongly Agree/Agree		Neutral		Disagree/Strongly Disagree	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
Because of LLI, I have a greater understanding of...						
The reading process.	83.3	62.5	0.0	25.0	0.0	0.0
The characteristics of leveled books and their relationship to successful reading.	83.3	75.0	0.0	12.5	0.0	0.0
The role of comprehension in successful reading.	83.3	75.0	0.0	12.5	0.0	0.0
How to improve children’s writing strategies.	50.0	50.0	33.3	37.5	0.0	0.0
Item	Percent Responded					
	Extensively/Sufficiently		Somewhat		Not At All	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
To what degree does your school administration support your efforts as an LLI teacher?	100.0	62.5	0.0	25.0	0.0	0.0
To what degree does the district support your efforts as an LLI teacher?	66.7	12.5	16.7	62.5	0.0	12.5
To what degree does your teaching schedule allow time to implement LLI effectively?	100.0	25.0	0.0	50.0	0.0	12.5
To what extent do you feel LLI has helped your English Language Learner students?	100.0	62.5	0.0	25.0	0.0	0.0
To what extent do you feel LLI has helped your students with special needs?	33.3	50.0	50.0	37.5	16.7	0.0
Item	Percent Responded					
	Regularly (Every day)/Frequently (3-4 days per week)		Occasionally (1-2 days per week)		Rarely (Less than 1 day per week)/Not At All (Never)	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
How often did your LLI group lessons last 45 minutes or more?	83.3	62.5	0.0	12.5	0.0	12.5
Were you able to meet every day with your LLI group(s)?	100.0	62.5	0.0	12.5	0.0	12.5
How often did you follow the LLI lessons exactly as instructed in the Lesson Guide?	100.0	62.5	0.0	0.0	0.0	25.0
How often were you able to implement LLI reading activities?	100.0	62.5	0.0	12.5	0.0	12.5
How often were you able to implement LLI writing activities?	100.0	62.5	0.0	12.5	0.0	12.5
Item	Percent Responded					
	Fall 2015			Spring 2016		
Do you think your school should continue the Leveled Literacy Intervention program?						
Yes	100.0			87.5		
No	0.0			0.0		

Note. Item percentages may not total 100% due to missing input from some participants.

The LLITQ invited LLI teachers to share open-ended comments regarding the reasons their schools should continue or not continue using the LLI system, and the strengths and areas for improvement of LLI. Participants’ responses to these items were summarized using a structured, multi-step process. First, the original comments were assigned codes representing their basic content. Next, these codes were grouped into categories, which were then organized into overarching themes. Final analysis produced frequency

percentages for each theme. Because it was possible for some comments to contain multiple content codes, the percentages reported reflect the total number of codes within each theme and not necessarily the total number of comments received from participants. Responses for each question are summarized and discussed below.

Continuation of LLI

In Fall 2015, when participating LLI teachers in DPS district were asked why their school should continue or not continue using LLI, no teachers provided a reason for their school to discontinue the use of LLI. Responses regarding reasons to continue LLI most frequently focused on the program design and instruction of the LLI (63.6%), with the majority of these comments related to the LLI's intervention design for low achieving students (57.1%). Other reasons cited by LLI teachers involved LLI's effectiveness in improving literacy skills (18.2%), positive effects for students and teachers (9.1%), and the LLI materials and resources (9.1%), particularly the interesting and excellent quality books. With regard to the positive effects of LLI program for students and teachers, most teachers' responses were related to student engagement.

In Spring 2016, when participating LLI teachers in DPS district were asked why their school should continue or not continue using LLI, no teachers provided a reason for their schools to discontinue the use of LLI. Reasons to continue LLI most frequently focused on the program design and instruction of the LLI (52.9%), with the majority of these comments related to LLI's intervention design for low achieving students (33.3%) and the regular basis of the system (22.2%). Other reasons cited by LLI teachers involved LLI's effectiveness in improving literacy skills (17.6%), positive effects for students and teachers (17.6%), and the materials and resources (11.9%). With regard to the positive effects of LLI program for students and teachers, all teachers discussed students' increased confidence in reading and learning in general. Finally, the materials and resources included the interesting books and differentiated reading materials.

Strengths of LLI

In Fall 2015, when participating LLI teachers in DPS district were asked about the strengths of LLI, their responses most frequently focused on the materials and resources (60.0% of overall comments) – particularly the interesting and leveled books, which were mostly mentioned in these responses (83.3%). Other resources mentioned included the resources for teachers' training (16.7%). The next most common theme regarding strengths involved the instructional components (20.0%) and the design and organization (20.0%) of LLI. Responses concerning the instructional components most frequently cited the targeted and differentiated instruction (50.0%) and the word work (50.0%). In the responses regarding the design and organization, teachers referenced the pacing of lesson plans or routines and the regular basis of LLI system.

In Spring 2016, when participating LLI teachers in DPS district were asked about the strengths of LLI again, their responses most frequently focused on LLI system's materials and resources (33.3%) as well as the instructional components of LLI (33.3%). The responses concerning materials and materials involved LLI interesting and leveled books (80.0%) and other supporting materials (e.g., take-home materials, 20.0%). The comments with regard to instructional components most frequently cited the targeted and differentiated instruction (40.0%), word work (20.0%), and the writing and reading emphasis (20.0%). The next most common theme of all the comments involved the design and organization of LLI (26.7%). In these responses, the participating teachers discussed the good pacing of LLI lesson plans or routines (25%), highlighted the small group format (25%) and regular basis (25%), and the user-friendly

characteristic (25%) of LLI system. Finally, 6.7% of overall responses were related to the effectiveness of LLI system, particularly about student engagement.

Improvements for LLI

In Fall 2015, regarding areas for improvement of the LLI system, participating LLI teachers in DPS district most frequently discussed the specific strategies and instructional components (57.1% of overall comments), including word work, writing, homework, and the transition between systems or programs (25.0% each). Another theme that frequently arose regarding areas for improvements involved program implementation (28.6%). With this theme, teachers discussed the need for more time during lessons (particularly on even-numbered lesson days) and the scheduling issues (e.g., protected time to teach). Lastly, 14.3% of teachers' overall comments were related to LLI materials and resources, specifically the online data management. One teacher stated that compared to the new version, the old version of online data management system was easier to use and had more attendance options.

In Spring 2016, regarding areas for improvement of the LLI system, participating LLI teachers in DPS district most frequently discussed the program implementation (60.0% of overall comments). With this theme, teachers highlighted the scheduling issues (e.g., protected time for both teachers and students, and the schedule for writing and reading lessons, 50.0%), the need for more staff to serve more students (33.3%), and more time during lessons (16.7%). Another theme that frequently arose regarding areas for improvements involved specific strategies and instructional components (20.0%), particularly the writing. Teachers mentioned that the writing section is challenging and more training is needed to implement it better. Lastly, 20.0% of teachers' overall comments were related to LLI resources, specifically more training and support for teachers.

Sample comments from LLI teachers are provided below.

Reasons to Continue or Not Continue

"I think that we should continue using LLI for our students because the lessons keep them engaged and the students love the books. It also helps us move our struggling students reading levels up quickly."

Strengths of LLI

"It [LLI] meets students at their level and also provides support for comprehension and decoding strategies at any level."

Areas for Improvements

"The homework could be more rigorous especially in the blue kit. F & P need to create booster kit that is between blue and red for third (or fourth) grade students who aren't ready to jump into red but have already been through blue."

Classroom Teacher Literacy Instruction Questionnaire (CTLIQ)

The Classroom Teacher Literacy Instruction Questionnaire (CTLIQ) was administered online to regular classroom teachers during Fall 2015 and Spring 2016 as a general measure of classroom teachers' literacy instructional strategies and perceptions of LLI and the core literacy program at their schools (Fall $n = 9$; Spring $n=17$). Table 15 illustrates the frequencies of responses for each item on the CTLIQ.

Overall, participating classroom teachers were most likely to “Agree” or “Strongly Agree” that their school believes that all children can learn to read and write (100% in Fall, 94.1% in Spring), that there is ongoing communication between LLI teachers and classroom teachers (88.9% in Fall, 76.5% in Spring), and that students who participate in LLI show increased achievement in literacy (77.8% in Fall, 70.6% in Spring). Also, classroom teachers “Regularly” or “Frequently” reported that students participate in whole group reading instruction (88.9% in Fall, 94.1% in Spring), students participate in small group or individual reading instruction (77.7% in Fall, 82.3% in Spring), they provide guided reading instruction with leveled texts (77.8% in Fall, 88.2% in Spring), they integrate vocabulary and comprehension (88.9% in Fall, 76.4% in Spring), and they read high-quality children’s literature to their students and engage in discussion on the text (88.9% in Fall, 88.3% in Spring). Regarding less positive areas of their school’s core literacy program, classroom teachers reported they “Disagree” or “Strongly Disagree” that parents participate in home literacy activities with their child(ren) (44.4% in Fall 2015 and 47.1% in Spring 2016). In addition, classroom teachers did not feel they were given sufficient planning time to fully implement the literacy program (66.7% in Fall 2015 and 52.9% in Spring 2016), and some a fair amount did not believe that instructional materials were readily available (55.6% in Fall 2015, 35.3% in Spring 2016).

Through their responses, participants also suggested differences regarding core literacy implementation and perceptions of the LLI program in Fall 2015 and in Spring 2016. In Spring 2016, a higher percentage of classroom teachers believed that they understood the goals of the school’s core literacy program (66.7 in Fall 2015, 94.1 in Spring 2016) and that they have a thorough understanding of how to implement the core program (11.1% in Fall 2015, 41.2% in Spring 2016). However, a lower percentage believed that administration protected the time needed for daily instruction (88.9% in Fall 2015, 52.9% in Spring 2016) and that the core program aligned with state standards (88.9% in Fall 2015, 52.9% in Spring 2016). Also in Spring 2016, teachers reported they were more likely to teach phonological awareness rarely or never at all (11.1% in Fall 2015, 35.3% in Spring 2016). There was also a drop in the number of classroom teachers who believed their school should continue to use their core reading model (66.7% yes in Fall 2015, 35.3% yes in Spring 2016). All items can be found in Table 15 below.

Table 15: CTLIQ Response Frequencies (Fall 2015 n = 9, Spring 2016 n = 17)

Item	Percent Responded					
	Strongly Agree/Agree		Neutral		Disagree/Strongly Disagree	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
I understand the goals of our school's core literacy program.	66.7	94.1	22.2	5.9	11.1	0.0
I have received adequate professional development for implementing our school's core literacy program.	33.3	29.4	33.3	52.9	33.3	11.8
I have a thorough understanding of how to implement our school's core literacy program.	11.1	41.2	66.7	52.9	22.2	5.9
Guidance and support are provided by our instructional and administrative staff to help us implement our core literacy program.	44.4	64.7	33.3	29.4	22.2	5.9
I believe our core literacy program has positively impacted students' literacy achievement.	33.3	41.2	44.4	23.5	22.2	35.3
Teachers are given sufficient planning time to fully implement our school's core literacy program.	11.1	29.4	22.2	17.6	66.7	52.9
Students in this school are more enthusiastic about reading, writing, and learning because of our core literacy program.	22.2	17.6	44.4	58.8	33.3	23.5
Our school has sufficient faculty and staff to fully implement its core literacy program.	55.6	47.1	44.4	35.3	0.0	17.6
Our administration protects the time needed for daily uninterrupted core literacy instruction.	88.9	52.9	11.1	29.4	0.0	17.6
Our students' parents participate in home literacy activities with their child(ren).	44.4	23.5	11.1	29.4	44.4	47.1
Teachers in this school are generally supportive of our core literacy program.	33.3	47.1	33.3	23.5	33.3	23.5
Teachers are encouraged to communicate concerns, questions, and constructive ideas regarding our core literacy program to school staff or administration.	44.4	35.3	33.3	41.2	22.2	17.6
Our core literacy program allows for teachers to provide differentiated instruction to address the varying strengths and needs of students.	33.3	47.1	55.6	23.5	11.1	29.4
Instructional materials (books, assessments, and other resources) needed to implement our core literacy program are readily available.	22.2	35.3	22.2	17.6	55.6	35.3
The faculty, staff, and administration in my school believe that all children can learn to read and write.	100.0	94.1	0.0	0.0	0.0	5.9
Our core literacy program is aligned with state and district reading and language arts standards/frameworks.	88.9	52.9	11.1	23.5	0.0	17.6
Professional development for our school's core literacy program has improved my reading instruction.	44.4	35.3	22.2	35.3	33.3	29.4
Our core literacy program adequately prepares our students for state assessments.	11.1	35.3	55.6	11.8	33.3	47.1
I have a clear understanding of the Leveled Literacy Intervention (LLI) program.	44.4	52.9	33.3	29.4	22.2	17.6
LLI supports the goals of my school's core literacy program.	77.8	64.7	22.2	23.5	0.0	11.8
Ongoing communication exists between LLI teachers and classroom teachers.	88.9	76.5	0.0	5.9	0.0	17.6
Students who participate in LLI show increased enjoyment of reading and writing.	55.6	64.7	22.2	11.8	22.2	23.5
Students who participate in LLI show increased achievement in literacy.	77.8	70.6	11.1	11.8	11.1	17.6
Students who participate in LLI show increased participation in classroom literacy activities and instruction.	55.6	52.9	33.3	29.4	11.1	17.6

Table 15: Continued

Item	Percent Responded					
	Extensively/ Sufficiently		Somewhat		Not at all	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
To what degree does your school administration support your efforts to implement your school's core literacy program?	44.4	53.0	55.6	41.2	0.0	0.0
To what degree does the district support your efforts to implement your school's core literacy program?	33.3	41.2	44.4	47.1	22.2	5.9
To what degree does your teaching schedule allow time to implement your school's core literacy program effectively?	0.0	35.3	100.0	41.2	0.0	17.6
To what extent do you feel your school's core literacy program has helped your English Language Learner students?	22.2	17.6	44.4	58.8	22.2	17.6
To what extent do you feel your schools' core literacy program has helped your students with special needs?	11.1	11.8	44.4	64.7	33.3	17.6
Item	Percent Responded					
	Regularly (Every day)/ Frequently (3-4 days per week)		Occasionally (1-2 days per week)		Rarely (Less than 1 day per week)/ Not At All (Never)	
	Fall 2015	Spring 2016	Fall 2015	Spring 2016	Fall 2015	Spring 2016
Students participate in whole group reading instruction.	88.9	94.1	11.1	0.0	0.0	5.9
Students participate in small group or individual reading instruction.	77.7	82.3	22.2	11.8	0.0	0.0
I provide guided reading instruction using leveled texts for groups of students with similar learning levels.	77.8	88.2	22.2	11.8	0.0	0.0
Students meet in small, heterogeneous groups to discuss the books that they are reading.	44.4	58.8	33.3	17.6	11.1	23.5
Students participate in writing activities, such as mini-lessons, independent writing, conferencing, and sharing.	77.8	70.5	22.2	23.5	0.0	5.9
I provide opportunities to develop oral reading fluency (e.g., shared reading, partner reading).	66.6	82.4	22.2	11.8	11.1	5.9
I teach phonological awareness (sound patterns, rhymes, etc.) to my students.	33.3	41.2	11.1	11.8	0.0	5.9
I integrate both vocabulary and comprehension into my literacy instruction and activities.	88.9	76.4	11.1	11.8	0.0	5.9
I read high-quality children's literature (e.g., fiction, non-fiction, poetry) to my students and engage them in interactive discussion.	88.9	88.3	11.1	5.9	0.0	5.9
I assign students home literacy activities to encourage parent participation.	66.6	58.8	33.3	35.3	0.0	5.9
Item	Fall 2015			Spring 2016		
Do you think your school should continue the current core literacy program?						
Yes	66.7			35.3		
No	22.2			52.9		

Note. Item percentages may not total 100% due to missing input from some participants.

The CTLIQ also invited classroom teachers to share open-ended comments regarding the strengths and areas for improvement of their school's core literacy program and the reasons that their school should continue or not continue the core literacy program. Classroom teachers' open-ended responses were analyzed using the same structured, multi-step process employed for the LLITQ comments and are summarized by question below. Also, because participating classroom teachers' responses were similar

for both Fall 2015 and Spring 2016, their responses for each question are summarized across both time points, and discussed regarding each question below.

Continuation of Core Literacy Program

In Fall 2015, participating DPS classroom teachers were asked why their school should continue or not continue using the current core literacy program. Overall, 40.0% of the comments were shared by the respondents who believed the program should be continued, while 20.0% were shared by the respondents who felt the program should be discontinued. Of the respondents who supported the program, half involved belief that the program meets students' needs (50.0%). A fourth of the respondents included supporting the writing component (25.0%), as well, a fourth of the respondents commented that they needed more time to implement properly (25.0%). Of the respondents who did not want to continue the core literacy program half of the responses exclaimed the length of lessons (50.0%) and half exclaimed the writing component to be weak (50.0%). 40.0% of the respondents fell into the not sure theme having either no opinion (75.0%) of the program or not participating in the core literacy program (25.0%).

In Spring 2016, participating DPS classroom teachers were asked why their school should continue or not continue using the current core literacy program. Overall, 19.6 of the comments were shared by the respondents who believed the program should be continued, while 73.91% were shared by the respondents who felt the program should be discontinued. A third of the respondents who supported the program comments involved belief that the program meets standards (33.3%). Other categories within this theme included the ability to meets students' needs (22.2%) and found the materials to be engaging (22.2%). Of the respondents who did not want to continue the core literacy program, the responses exclaimed a lack of materials (35.0%), more emphasis on the reading component (14.7%), and that the program does not meet students' needs (11.7%). 6.5% of the respondents fell into the not sure theme having either no opinion of the program (33.3%) or not participating in core literacy (66.6%).

Strengths of Core Literacy Program

In Fall 2015 participating DPS classroom teachers were asked about the strengthens of their school's core literacy components. Of the overall responses, 44.4% commented that they did not participate in the program. 33.3% of the overall respondents focused on resources, particularly books (66.6 %) and the curriculum (33.3%). Additionally, teachers mentioned the instructional components as a strength with 22.2% of the overall comments. All of these comments focused on teacher implementation (100%).

In Spring 2016 participating DPS teachers were asked about the strengths of their school's core literacy components. Over half of the overall responses (63.1%) focused on the resource component such as curriculum (33.3%), books (25.0%), and materials (25.0%). Of the overall responses discussed, 26.3% focused on positive program characteristics. These consisted of the ability to meet standards (40.0%), the ability to meet individual students' needs (20.0%), time (20.0%), and schedule (20.0%). 5.2% of the responses discussed focused on the program's instructional components, in particular the reading portion (100%). Finally, one comment mentioned that they did not participate in the program (5.2%).

Improvements for Core Literacy Program

Regarding areas of improvement for the core literacy program, fall 2015 DPS teachers most frequently commented on the instructional component with 33.3% of the overall comments. Within this theme, nearly half (40.0%) of the comments were related to time restraints. Other categories included specialized instruction for subgroups (20.0%), writing skills (20.0%), and reading skills (20.0%). Further, of the overall responses, 26.6% involved resources, a fourth (25.0%) focused on books, a fourth (25.0%) on professional development, a fourth (25.0%) on materials, and a fourth (25.0%) on staff support. The classroom teachers cited the curriculum organization and delivery to be an area of improvement in 20.0% of the comments which all included organization. Finally, 20.0% of the responses were from teachers who did not participate in the core literacy program.

Regarding areas of improvement for the core literacy program, Spring 2016 DPS teachers most frequently commented on the instructional component with 45.8% of the overall comments. Within this theme, nearly half (45.4%) of the comments were related to writing skills. Other categories included specialized instruction for subgroups (18.0%), comprehension skills (18.0%), and time restraints (18.0%). Further, of the overall responses, 33.3% involved the curriculum organization and delivery. Half of these comments focused the need of simplification, roughly a third (37.5%) focused on organization, and a fourth (25.0%) on materials. Finally, the classroom teachers cited resources to be an area of improvement in 20.8% of the comments, which included materials (60.0%), books (20.0%), and professional development (20.0%).

Selected comments:

“We should continue, but with more professional development, teacher planning time, and invitations to teachers to talk through and change lesson plans as needed. If we do not continue, it only means we will need a different program, and too much time and energy is spent by teachers each year learning/planning for new curriculum.”

Leveled Literacy Intervention Principal Questionnaire (LLIPQ)

Given the small number of responding principals in DPS, these responses were left aggregated to protect confidentiality. Please see the overall report for general principal comments across districts.

Home Literacy Support Questionnaire (HLSQ)

The Home Literacy Support Questionnaire (HLSQ) was administered to parents/guardians of treatment and control group students at the end of the school year as a general measure of their support for literacy at home and perceptions of their child’s literacy instruction at school – including LLI, if applicable ($n = 96$). Table 16 illustrates the frequencies of responses for each item on the HLSQ. Most of the participating parents/guardians reported positive perceptions of their child’s literacy activities at home and school and the amount of home literacy support they provide. Further, of those parents/guardians who indicated that their child has participated in LLI, a large majority shared positive perceptions of the experience.

Overall, participating parents/guardians were most likely to “Agree” or “Strongly Agree” that they encourage their child to practice reading at home (96.9%), that they believe their child can become a good reader and writer (95.8%), and that they encourage their child(ren) to practice writing at home (89.4%). Additionally, of those parents indicating that their child participated in LLI, almost all “Agreed” or “Strongly Agreed” that their child’s school should continue using LLI (90.0%) and that their child’s participation in LLI improved his/her reading and writing (92.5%). More than half of the participating parents/guardians “Agreed” or “Strongly Agreed” that they participate in LLI take-home activities with their child (60.0%). All items can be found in Table 16 below.

Table 16: HLSQ Response Frequencies (n = 96)

Item	Percent Responded		
	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree
My child enjoys reading and writing.	83.3	13.5	3.1
My child reads and writes at home.	89.6	7.3	2.1
I read and write with my child at home.	75.0	19.8	4.2
I have books at home for my child to read.	91.7	5.2	3.1
I read books to my child at home.	75.0	17.7	7.3
I encourage my child to practice reading at home.	96.9	2.1	1.0
I encourage my child to practice writing at home.	91.7	4.2	3.1
I believe my child can become a good reader and writer.	95.8	3.1	0.0
I am pleased with the instruction my child is receiving in reading and writing at school.	86.5	10.4	3.1
I participate in reading and writing activities at my child’s school.	55.2	22.9	20.8
I know how my child is doing in reading and writing at school.	85.4	9.4	3.1
Item	Percent Responded		
Has your child participated in the Leveled Literacy Intervention (LLI) program at his/her school?			
No	35.4		
Yes	41.7		
Not sure	20.8		
Item	Percent Responded		
Item	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree
I think my child’s participation in LLI has improved his/her reading and writing.	92.5	5.0	2.5
I participate in LLI take-home activities with my child.	60.0	22.5	15.0
I think my child’s school should continue using the LLI program.	90.0	10.0	0.0

Note. Item percentages may not total 100% due to missing input from some participants.

Parents/guardians who completed the HLSQ also responded to open-ended questions regarding their perceptions of the strengths and areas for improvement of their child’s literacy instruction at school. Their open-ended responses were analyzed using the same structured, multi-step process employed for the teacher and principal surveys and are summarized by question below.

When asked their opinion of the best things about the reading and writing instruction their child receives at school, participating parents/guardians most commonly discussed the positive impact the program had on the students (51.4%), including: children having learned and/or noticeably improved (86.1%), children having more enthusiasm for reading and writing (11.1%), and children having more

confidence regarding reading and writing (2.8%). In addition, one-fifth (20.0%) of responses related to positive characteristics of the program in general, including: instruction that is targeted to individual reading levels and needs (28.6%), encouragement to read and write (28.6%), support for struggling students (21.4%), opportunity for home practice (14.3%), and instruction and experiences that are enjoyable (7.1%). Further, one-tenth (10.0%) of the overall responses were related to specific instructional components, including: one-on-one or small group instruction (42.9%), group work (28.6%), books/materials (14.3%), and reading and writing strategies (14.3%). Finally, in 4.3% of comments, respondents generally discussed liking the literacy program and feeling pleased with the instruction their child is receiving, though respondents in 10.0% of comments stated that they were not sure or did not share any positive perceptions. 4.3% of comments were not directly related to the reading program.

Participating parents/guardians were also asked what changes they would like to see in their child's reading and writing instruction. The most common response was that no changes were needed or that they were pleased with their child's progress (41.4%). In slightly less than one quarter (24.1%) of responses participants recommended instructional changes, including: greater emphasis on writing and/or handwriting (57.1%), more challenging instruction (21.4%), fewer demands on children and/or more flexibility with work (14.3%), and more reading (7.1%). Further, in slightly over one-sixth of responses (17.2%), participants discussed the need for additional support or resources, including: school-level resources and support (e.g. expanded library access, classroom books, expansion of the literacy program across grades, etc.; 40.0%) communication with parents/guardians (30.0%), and individualized attention for students (30.0%). Finally, parents/guardians discussed a general desire to see continued improvement in reading and writing in 6.9% of comments, while others in 6.9% of comments expressed a more substantial need for increased student achievement (e.g. to get on grade level, because child was still struggling significantly, etc.). 1.7% of respondents stated not being sure what could be improved. Another 1.7% of comments were not directly related to improvements for the reading program.

Sample comments from parents/guardians are provided below.

Strengths

"My daughter's teacher challenges her to try new things. She has drastically improved this year! She is now confident in her reading ability".

Changes Needed

"I think they need to have writing homework each night also. It is not to just practice writing, teaching about also how it looks."

Stakeholder Feedback

LLI Teacher Focus Group

In order to obtain feedback regarding implementation of the LLI system from current LLI instructors, a voluntary focus group was conducted with those LLI teachers who took part in the study. A semi-structured focus group was utilized. Responses from LLI teachers are summarized by question below.

Responses from LLI teachers were overwhelmingly positive in regard to their overall perceptions of LLI. Most respondents commented that their students made good progress and were consistently engaged in the program. Teachers thought that the quality of the books was particularly good, which kept the students interested. Teachers also liked that the program allowed for greater involvement with the students, since it is small-group focused.

When LLI teachers were asked to discuss the strengths of the LLI system, responses were varied and enthusiastic. One of the most frequently mentioned strengths was the material, including the guides and books. Teachers mentioned that having the guides was very helpful during the lessons because they were structured and provided a good routine. The teachers also mentioned that both the fiction and nonfiction books were well written and that the students could relate the books to their own lives. One teacher also commented that it was good that LLI uses real literature, whereas many other sources do not. On that point, the respondent also mentioned that one of the teachers had personally bought one of the books because of the high quality. Further, the teachers reported particularly liking the book series, as the students seemed to like them the most. In addition to liking the materials, the teachers also reported liking the activities, as they found them to be engaging for the students. One teacher mentioned that the students love the extra activities that go along with the reading. A last commonly mentioned strength was in the breadth and depth of the content. Teachers liked that the program covered multiple aspects of reading, from phonics to more advanced skills. In addition, some reported liking that the program allowed them to come back around to certain principles multiple times.

When asked about areas of LLI that might need improvement, LLI teachers primarily mentioned issues with the data system, the need for more coverage of writing, and the length of time to complete certain activities. Teachers mentioned that the data system was in general not very user friendly. Further, while some issues had been addressed from the previous year, such as being able to enter data for a group rather than individuals only, other issues had arisen. For instance, a number of teachers mentioned what could be entered into the system was very limited. Specifically, one teacher mentioned that one could no longer enter date ranges for holidays and fieldtrips, while also addressing the need for more options regarding why a teacher or student is not available. Another teacher agreed with this and suggested adding an “other” option that could be filled in. Aside from these issues, teachers also mentioned the need to better cover writing. Some teachers mentioned that there was not enough time allotted to work on writing and that more time needs to be spent on learning the basics of writing strong paragraphs. One teacher also mentioned that students need to build up to writing but are at times required to jump between tasks of varying difficulty. Finally, a number of the participants mentioned issues getting certain activities to fit with others within the allotted time frames. One teacher mentioned that the novel lessons are longer and do not fit into a 45-minute period, especially if there are other parts to the lesson. In addition, some teachers believed it was very difficult to get a reading record done in a brief time frame in order to then get writing done in the same day.

When focus group participants were asked to comment on common logistical issues they encountered when implementing the LLI system, many comments focused on issues with scheduling and consistency in getting students, the amount of time allotted, and difficulties having students of significantly different reading level in the same group. In terms of scheduling, respondents commented that it was sometimes hard to secure a space for the groups and that getting the students for the groups on a regular basis was difficult. Consistency in getting the students for group was seen as the largest of these concerns, as students were sometimes late, thus not receiving the full 45 minutes, or would be held in the regular classroom to complete other assignments that were considered more important by the regular classroom teachers. One respondent mentioned that some classroom teachers have even sent assignments for the students to finish before returning from the LLI group, preventing actual participation even when the student is there. A final logistical issue mentioned was the difficulty of effectively addressing great differences in student reading levels within the same group. One teacher mentioned that having quicker readers in with slower readers prevented the groups from being most effective. In this case, the teacher mentioned that it would be helpful to have the students with others of similar level. However, the teachers mentioned that rotating students to other groups was not always feasible given the limited number of groups and teachers.

When LLI teachers were asked how effective LLI has been in meeting individual students' needs, all respondents reported that it had been very effective. Some of the teachers mentioned that it was effective because it allowed them to identify student strengths and set goals based on those strengths, though one teacher mentioned that this requires teacher "know-how" to be effective. In addition, teachers mentioned that LLI allows for one-on-one time with students in order to focus on meeting individual needs. Aside from this, a number of the teachers mentioned that having prompts helped them know where to get students to focus in order to meet their specific needs. Finally, one of the teachers mentioned that the program helped boost students' confidence in reading, which helped the students enjoy the work and think more deeply about it than they would have otherwise.

When LLI teachers were asked about administrative support, they reported mixed support. While some teachers felt very supported by administration, others commented that administration had been placing too many demands on them without providing additional support. Some mentioned that they did not think administration understood the importance of having intervention every day. One problem mentioned across many of the respondents was being pulled to substitute. Many of the respondents, even those that did feel supported by administration, mentioned that they had been pulled many times to substitute for other classes or serve as proctors for exams. Many times this would happen without notice and would disrupt their ability to have the LLI groups as planned. A final issue mentioned by one teacher is that LLI has become a catch-all for some administrators in that they will place any students in the groups when they do not know where else to place them. This also leads to getting some of the same students repeatedly, even if they are not responding to the intervention. When asked about support from other faculty, respondents mentioned that the teachers were mostly supportive. In general, respondents felt that the teachers saw the value in LLI and have been flexible with scheduling. One teacher mentioned that the classroom teachers always enforce going to LLI. Some teachers also mentioned that the only faculty that are not always supportive are either new and do not know about LLI and its importance or generalize failure in a few students' lack of progress to mean that the whole program does not work. However, these instances were rare.

When asked their opinions about the training they received, many of the LLI teachers reported that the training was very effective and supportive. Many teachers reported that the training was helpful and valuable, with one stating that the training was, "one of the best things we've done". Comments

regarding improvements focused on increasing discussion time and having more training sessions throughout the year. Many of the teachers mentioned that they found discussion with other teachers and the instructors most helpful, as it helped problem solve certain issues and provided different perspectives. The teachers reported wanting to have more time during training for this type of discussion and collaboration. Teachers also mentioned that it would be better to have more training sessions that could serve as refreshers and a time to share specific obstacles. One teacher also brought up the specific recommendation of spending more time on learning how to grade, particularly for open responses and comprehension. This teacher mentioned that this could help the teachers more easily distinguish differences between a “3 or 4 answer”.

Site Researcher Focus Group

Because the site researchers who collected observational and student benchmark data for the study were primarily retired teachers who had experience teaching in the districts, CREP researchers utilized focus groups to solicit their feedback regarding LLI and its implementation. The site researchers were able to provide an objective “outsider’s” perspective based on their random observations of the LLI groups. Approximately 4 site researchers voluntarily participated in the focus groups across all three districts. Responses are summarized below.

When asked their overall perceptions of LLI, the on-site researchers’ responses were very positive. Respondents mentioned that the program is very thorough and rigorous, and that it provides good scaffolding and scripting for the teachers. One respondent commented that, “the quality and subject matter is incredible”. The respondents also mentioned that the materials used, including the books, are terrific, and that the program does a good job of connecting the skills with the books. However, the respondents did mention that the program covers a lot of material in a short amount of time and requires extensive teacher preparation to be successful.

On-site researchers also shared their perceptions of the strengths of LLI. The biggest strength mentioned by respondents was the structure of the lessons, including the pacing. Respondents stated that the lesson length of 45 minutes was a perfect length, allowing for good pacing, and that the lesson layout was “phenomenal”. The respondents also liked the variety in the lessons. Aside from this, the respondents also mentioned the impact on students as a strength. Respondents reported that the students were excited to go to LLI, engaged while there, and excited to take the books home. Respondents also reported to seeing a good amount of progress for the students. Finally, respondents also mentioned seeing the small size of the groups as a strength.

When asked what areas of LLI may need improvement, respondents most commonly mentioned improvements to the questioning. Some respondents believed there were too many surface-level questions and that higher-order questioning was needed. Some respondents also mentioned that some teachers may benefit from additional training, particularly those that are paraprofessionals or those with less background knowledge of the program or reading intervention in general. One respondent also brought up a specific comment regarding the running records. This respondent noted that there were many running records to be completed and wondered if they are all necessary. It was mentioned that cutting down some of these records might free up more time for other aspects of the lessons.

Participants in the focus group were also asked about student responses during LLI observations and the quality of LLI for the study students. In regard to student responses to LLI, respondents commented that the students were very engaged and interested. The respondents mentioned that the

students loved coming, and one mentioned that, “one student came 15 minutes early from lunch because she wanted to be ready”. The respondents mentioned that the small group size contributed significantly to this engagement and that it also made the students seem secure and open to ask questions. One respondent also mentioned that the teachers had an opportunity to build a relationship with the students and that this provided more teacher time than the students would get in a regular class. In terms of the quality of LLI instruction, the respondents commented that the overall quality was good to excellent. Many of the respondents reported being impressed with the teachers. However, the respondents did note that there was a difference in the level of commitment across teachers. One also mentioned that some of the variability in teacher quality was due to differences in the experience of the teachers, stating that some teachers’ knowledge bases meshed better with the demands of the program.

Finally, participants were asked about their perceptions of the training they received and the instruments they used to collect the data for the study (i.e., the LOT and LLIOT observations and the Fountas & Pinnell Benchmark Assessment System). Respondents reported that the training was overall very good with a few areas for improvement. The most commonly mentioned issue was that the most recent training was difficult, more so than the previous training before it. Part of this reason was that some things had been forgotten since the previous year’s training. Also on this point, some respondents mentioned that the training entailed a considerable amount of extra work. In terms of the instruments used, the majority of respondents reported being impressed with the instruments. One respondent mentioned that the rubric was particularly rigorous. As for improvements, one respondents mentioned having some trouble with the LOT. Specifically, this respondent stated that the LOT may be impacted by the time of year in which it is being used. For instance, this respondent mentioned seeing a great amount of excellent instruction happening after the time the observations were done, but not when completing the observations. This was considered to be an issue with the period of time during which observations were conducted, and the respondent mentioned that even during the observation certain indicators of good instruction were present, such as the layout of the room and use of motivational materials. Another respondent also mentioned that many things had to been taken off the walls due to testing, though the LOT had a part relating to what was seen on the walls, such as word charts, alphabets, and other supportive materials.

Conclusions

1. What progress in literacy achievement, if any, do students who receive LLI in grades 3-5 make compared to students who receive core literacy instruction alone?

Results revealed that LLI positively impacts some 3rd-5th grade students' literacy achievement. In particular, two of the three types of analyses showed important results: 1) when treatment and control group students were equivalent at baseline, and 2) when the control group had a baseline advantage. Positive effects were observed for several subgroups in DPS. While none of the findings were statistically significant, there were a number considered substantively important based on guidelines from the What Works Clearinghouse (WWC) (i.e., an effect size of +/- 0.25; What Works Clearinghouse, 2014). Detailed findings for each subgroup are presented in the body of this report; however, some of the strongest findings are outlined below.

With regard to **benchmark levels**:

- When equivalent at baseline, 4th grade white students in LLI showed substantively higher gains compared to control students.
- When starting at a disadvantage, 3rd grade low achieving students in LLI showed substantively higher gains compared to control students. This was also true for 3rd grade low achieving minority and economically disadvantaged students.
- Even when starting at a disadvantage, 4th grade high achieving minority students in LLI showed higher gains close to substantively important compared to control students.

With regard to **state achievement scale scores** in literacy:

- When equivalent at baseline, 4th grade low achieving students in LLI and 5th grade LLI students in general, as well as those also minorities, ELLs, or economically disadvantaged showed substantively higher gains compared to control students.
- When starting at a disadvantage, 4th grade ELL students in LLI showed substantively higher gains compared to control students.
- When starting at a disadvantage, 5th grade economically disadvantaged students in LLI, including those that were high achieving, as well as high achieving minority students showed substantively higher gains compared to control students.

With regard to **state achievement proficiency** in literacy:

- When starting at a disadvantage, 4th grade students in LLI overall, as well as various subgroups, such as Hispanic LLI students, showed substantively higher gains compared to control students.

2. At what level of fidelity to the program model is LLI implemented by teachers participating in the study?

Overall, the observation results from the current study suggest that LLI was implemented with good fidelity to design. When observed, the majority of lesson components received acceptable to high fidelity ratings, with very few indications of needing improvement. However, a few components went

unobserved in over half of the observations. More generally, the majority of site researchers concluded that the lessons they observed were delivered as designed. Site researchers also had a favorable opinion in their open-ended comments, of which the large majority were positive and very few indicated areas needing improvement. Site researchers largely described the observed LLI instruction as rigorous and of high quality, including the pacing, organization, and adherence to LLI protocols, as well as including effective use of instructional strategies and lesson resources. Additionally, the observation results revealed that LLI implementation was consistent across the school year, with acceptable fidelity scores at both time points when the observations were conducted. Changes in implementation over the year generally indicated improvement, with a substantively important improvement literacy instructional strategies in third grade and in quality of implementation in 5th grade. However, there was a substantively important decrease in quality of implementation and learning environment for third grade as well, though no subscale was rated as needing improvement at either time point.

The observation results were complemented with self-report feedback from the participating LLI teachers, a majority of whom reported implementing LLI as designed (e.g., meeting daily for 45 minutes, following the LLI Lesson Guide), understanding the LLI goals and procedures, and having sufficient training to implement LLI effectively. However, there was a decrease between Fall and Spring in how many teachers thought they had sufficient training to implement LLI and a thorough knowledge of how to implement LLI. Also, LLI teachers noted that they were often asked to do other tasks that conflicted with LLI lesson time and were not given the planning time necessary or support needed for LLI implementation. This may have impacted students' progress as seen in the overall achievement results.

Finally, the LLI attendance records that were available (90% of treatment group) from the current study revealed that the average number of days attended by the treatment group was just over the recommended number of LLI instructional days (i.e., approximately 90-120 days/18-24 weeks). Of these students with attendance data, when looking individually at each student, the data revealed that 51% of these students *did* receive the recommended dosage; however, the remaining 50% of LLI students *did not*. Student absences were due to several student-level factors (e.g., individual absences or unavailability during LLI group time) as well as school or district limitations (e.g., holidays, assessment windows during which LLI teachers and/or students were pulled during LLI group time, delays in starting LLI due to scheduling conflicts or difficulty accessing student data). Therefore, the findings at each grade level which are not meeting statistical significance or substantively important progress may have been impacted due to a large number of treatment students not receiving a full dosage of LLI. Schools should note the importance of consistently providing LLI throughout the year so the students can make the most progress by receiving, at a minimum, the recommended amount of LLI lessons.

3. What are stakeholders' perceptions of the LLI system for grades 3-5 and the core literacy program?

Overall, LLI teachers, classroom teachers, principals, parents/guardians, and site researchers shared positive perceptions of the LLI system and its impact on struggling students' literacy success. Stakeholders felt that LLI has benefits for students' literacy achievement and skills as well as their engagement in reading and writing. Stakeholders also reported positive perceptions of such aspects of the LLI system as its design, instructional components, and materials (particularly the lesson books). However, although stakeholders generally perceived LLI as helpful, there was common feedback regarding the need for improving the data management system used for LLI and the need to more thoroughly incorporate writing. In general, stakeholders discussed the need for more time to complete lessons, more

staff in order to appropriately serve students, and better identification of different students for participation rather than targeting the same students all year.

Regarding the core literacy instruction, stakeholders' perceptions were mixed, with both positive and negative opinions. Stakeholders perceived that their schools are generally supportive of literacy and provide a high-quality learning environment conducive to learning. Further, stakeholders shared positive perceptions of the core literacy program's classroom materials. However, stakeholders agreed that the core literacy instruction also has areas of improvement. This included needing a new curriculum that is consistent for all grade levels, as different grade levels used different programs, an increased focus on comprehension, more materials for home and school, and the need to cover a greater range of skills.

Limitations of the Study and Recommendations

Although the current study produced important positive findings regarding the efficacy of LLI in grades 3-5, several factors were encountered that may limit the generalizability of the findings and that prevented researchers from obtaining adequate power to draw definitive conclusions. These limitations are summarized below, followed by data-based recommendations for improvement.

The primary limitation facing the current study involved the sample being non-randomized, which, while not ideal for research, was a real-world constraint for obtaining districts that would participate in the study. While the study had a control group of students who were matched on demographic characteristics and initial reading levels, we also conducted baseline equivalence testing to determine if the treatment and control groups were equivalent groups at the beginning of the study. Our results found, in several cases, that they were not equivalent at the start, and because of this, our findings in those instances (as noted in the results section) should be interpreted with caution.

The sample size, or the number of students that were able to participate in the study, of our subpopulations was also a limitation. Although some positive effects were detected with marginal statistical significance and/or "substantively important" effect sizes according to What Works Clearinghouse guidelines (U.S. Department of Education, 2011), the small size of some subgroup samples may have made it more difficult to detect significant differences between the literacy gains of treatment and control group students.

A third limitation of the study design was the fact that control group students were allowed to receive other supplemental literacy services while they were participating in the study, as long as they did not receive LLI until after the study was over. This was a district-level request that was necessary in order for them to agree to participate in the research study. Additionally, the supplemental literacy services received by control group students could vary from school to school and district to district. The fact that both groups could receive additional literacy services may have resulted in a smaller difference in literacy gains between treatment and control group students. However, this limitation serves to increase the meaningfulness of the significant gains made by treatment group students in comparison to the control group, because receiving LLI helped these treatment group students outperform control group students who not only received core literacy instruction, but also supplemental literacy services.

A final limitation of the study was the fact that half of the treatment group students did not receive the recommended amount of LLI instructional time as a result of individual absences, delays in starting LLI due to the time required to obtain consent and pretest students, and district-level factors (e.g., holidays, assessment days, and LLI teachers being pulled from their LLI groups for other activities).

Although it is not clear whether receiving the recommended number of instructional days would have produced more significant results, it is possible that maximizing LLI instructional time would have resulted in greater student gains. However, similar to the above limitation regarding control group students receiving supplemental literacy services, this limitation serves to increase the meaningfulness of treatment group students' literacy gains during the shortened timeframe in which they received LLI.

Recommendations

The limitations above reflect the inherent complications in performing educational research across different districts. However, despite these limitations, the current study found educationally meaningful, positive effects of LLI on students' literacy achievement when implemented with sufficient fidelity to the LLI model. Further, stakeholders in the district – including teachers, administrators, and parents/guardians – were generally supportive of LLI and perceived positive benefits of the LLI system for their students. Altogether, the results from this study allow us to conclude that LLI positively impacts upper elementary students' literacy skills, particularly in 4th and 5th grades, and for minorities, ELL, and Economically Disadvantaged students as well as the lowest-level readers coming into LLI. These results also suggest that continued implementation of LLI would be beneficial in each of these districts and offer an opportunity for research-based recommendations that may enhance the system, future LLI research, and ultimately student achievement. From this study, CREP proposes the following recommendations with regard to LLI and its implementation in schools:

Design

1. Some teachers also mentioned specific aspects of the materials, such as the ease of use of the prompting guide and issues with data management tools. For data management, teachers mentioned an inconsistency between systems for running records. One improvement mentioned regarded the individualization of material for students. For example, if a student needed more work with phonics or mastered some levels but were not ready for the next highest level, they might have to repeat work, which was not enjoyable for the students.

Implementation

1. In both the current study and a previous study of LLI (Ransford-Kaldon et al., 2010), schools experienced difficulty achieving the minimum of 18 weeks, or 90 days, of LLI instruction. Even though it is possible to implement the program across 18-24 calendar weeks, they are not full weeks of instruction due to holidays, assessments, etc., as well as individual student and teacher absences or unavailability. This is even more difficult during the second semester when schools have multiple end-of-year assessments and activities as well as such events as spring break. Therefore, districts should prioritize LLI teachers for LLI instruction rather than pulling them for other activities to maximize instructional time for vulnerable students.
2. Districts should be discouraged from allowing students to be pulled for LLI (or other supplemental interventions) during the classroom literacy block.
3. Feedback from LLI teachers suggested that the LLI lessons may be too fast-paced for slower learners, resulting in a lack of time to spend on specific components students need. The district could

consider providing recommendations on how best to individualize instruction to meet the needs of both higher-achieving and lower-achieving students in a group when regrouping is not feasible.

Professional Development (PD) Considerations

1. Some participants felt somewhat overwhelmed by the amount of content and difficulty of the training. Recommendations for improvement focused on providing more time to practice and discuss the material, which participants found to be the most helpful part in learning the nuances of LLI and potential solutions to issues during implementation.
2. Feedback from LLI teachers described examples of high-quality LLI instruction as particularly useful during the LLI PD. The district might consider including more video clips of teachers performing specific LLI instructional routines or strategies during the PD sessions. Additionally, a bank of video clips or webinars on the district website may be helpful in providing ongoing support to LLI teachers.
3. Additional training on the LLI Online Data Management System is suggested to help teachers and administrators more easily navigate the system and address technical issues as they arise.

Future Directions

1. Additional studies empirically evaluating LLI instruction with varying group sizes and varying teaching staff (e.g., Literacy Specialists, Special Education instructors, LLI-trained paraprofessionals) could provide a research-based conclusion as to whether LLI can be adapted to address the limited staff and capacity of some districts preferring to implement LLI with larger group sizes and varying teaching staff.

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Appendices

Appendix A:
Denver Benchmark Summaries

Appendix B:
Fountas & Pinnell Grade-Level Equivalence Chart

**Appendix A:
Denver Benchmark Summaries**

Table 17: Denver Benchmark Level Gain Effect Size Summary

Subgroup	Grade 3			Grade 4			Grade 5		
	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median
All Students		2.31 [^]							
Economically Disadvantaged Students		2.31 [^]							
Limited English Proficient Students									
Special Education Students									
African-American Students									
Hispanic Students									
Minority Students		2.31 [^]			0.23 ^{^^}				
White Students				0.45 [^]					

Note. Green cells are comparisons with baseline equivalence where LLI students had a substantively important or statistically significant advantage on the outcome. Purple cells are comparisons where control students had a substantively important advantage on the pretest, but LLI students had an advantage on the outcome. Pink cells are comparisons where control students had a substantively important advantage on the pretest, and also had an advantage on the outcome, but the outcome was not substantively important. Cells with an asterisk (*) were statistically significant. Cells with a (^) were substantively important (i.e., effect size (g) ≥ 0.25). Cells with a (^^) were nearly substantively important.

Table 18: Denver Scale Score Gain Effect Size Summary

Subgroup	Grade 3			Grade 4			Grade 5		
	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median
All Students					0.60 [^]		0.49 [^]		0.62 [^]
Economically Disadvantaged Students					0.57 [^]		0.49 [^]		0.59 [^]
Limited English Proficient Students				0.25 [^]	0.42 [^]				
Special Education Students									
African-American Students									
Hispanic Students							0.62 [^]		
Minority Students					0.58 [^]		0.49 [^]		0.62 [^]
White Students									

Note. Green cells are comparisons with baseline equivalence where LLI students had a substantively important or statistically significant advantage on the outcome. Purple cells are comparisons where control students had a substantively important advantage on the pretest, but LLI students had an advantage on the outcome. Pink cells are comparisons where control students had a substantively important advantage on the pretest, and also had an advantage on the outcome, but the outcome was not substantively important. Cells with an asterisk (*) were statistically significant. Cells with a (^) were substantively important (i.e., effect size (g) ≥ 0.25).

Table 19: Denver Proficiency Gain Effect Size Summary

Subgroup	Grade 3			Grade 4			Grade 5		
	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median
All Students				0.58^	0.68^				
Economically Disadvantaged Students				0.62^	0.64^				
Limited English Proficient Students					0.61^				
Special Education Students									
African-American Students									
Hispanic Students				0.72^					
Minority Students				0.58^	0.64^				
White Students									

Note. Green cells are comparisons with baseline equivalence where LLI students had a substantively important or statistically significant advantage on the outcome. Purple cells are comparisons where control students had a substantively important advantage on the pretest, but LLI students had an advantage on the outcome. Pink cells are comparisons where control students had a substantively important advantage on the pretest, and also had an advantage on the outcome, but the outcome was not substantively important. Cells with a (^) were substantively important (i.e., effect size (g) ≥ 0.25).

Table 20: Denver Effect Size Summary by Type

Subgroup	Grade 3			Grade 4			Grade 5			Total
	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median	Combined	At/Below Median	Above Median	
Total	0	3	0	6	9	0	4	0	3	25
Baseline Equivalence	0	0	0	1	4	0	3	0	0	8
Control baseline advantage, LLI outcome advantage	0	3	0	5	5	0	1	0	3	17
Control baseline and outcome advantage, outcome not SI	0	0	0	0	0	0	0	0	0	0
Low Sample Size	0	3	0	6	9	0	4	0	3	25

Table 21: Denver Effect Size Summary by Type and Outcome

Total	BAS	Scale Score	Proficiency	Total	%
Baseline Equivalence	1	7	0	8	32.0%
Control baseline advantage, LLI outcome advantage	4	5	8	17	68.0%
Control baseline and outcome advantage, outcome not SI	0	0	0	0	0.0%
Total	5	12	8	25	100.0%

Table 22: Denver Effect Size Summary by Subgroup

Subgroup	Grade 3			Total	%	Grade 4			Total	%	Grade 5			Total	%	Total	%
	Combined	At/Below Median	Above Median			Combined	At/Below Median	Above Median			Combined	At/Below Median	Above Median				
Minority Students	0	1	0	1	14.3%	1	3	0	4	57.1%	1	0	1	2	28.6%	7	28.0%
All Students	0	1	0	1	16.7%	1	2	0	3	50.0%	1	0	1	2	33.3%	6	24.0%
Economically Disadvantaged Students	0	1	0	1	16.7%	1	2	0	3	50.0%	1	0	1	2	33.3%	6	24.0%
Limited English Proficient Students	0	0	0	0	0.0%	1	2	0	3	100.0%	0	0	0	0	0.0%	3	12.0%
Hispanic Students	0	0	0	0	0.0%	1	0	0	1	50.0%	1	0	0	1	50.0%	2	8.0%
White Students	0	0	0	0	0.0%	1	0	0	1	100.0%	0	0	0	0	0.0%	1	4.0%
African-American Students	0	0	0	0	0.0%	0	0	0	0	0.0%	0	0	0	0	0.0%	0	0.0%
Special Education Students	0	0	0	0	0.0%	0	0	0	0	0.0%	0	0	0	0	0.0%	0	0.0%

**Appendix B:
Fountas & Pinnell Grade-Level Equivalence Chart**

Grade-Level Equivalence Chart					
Grade	Fountas & Pinnell Level	Basal Level	Reading Recovery Level	Rigby Level	DRA Level
Kindergarten	A	Readiness	1	1-2	A, 1, 2
Kindergarten	B		2	3-4	
Kindergarten	C	PP1	3, 4	5	3
Grade 1	D	PP2	5, 6	6	4
Grade 1	E	PP3	7, 8	7	6, 7, 8
Grade 1	F	Primer	9, 10	8	10
Grade 1	G		11, 12	9	12
Grade 1	H	Grade 1	13, 14	10	14
Grade 1					
Grade 2	I		15, 16	11	16
Grade 2	J	Grade 2	17, 18	12	18, 20
Grade 2	K		19, 20	13-14	
Grade 2	L			15	24-28
Grade 2					
Grade 3	M			16-17	
Grade 3	N	Grade 3		18	30
Grade 3	O			19	
Grade 3					
Grade 4	P			20	34-38
Grade 4	Q	Grade 4			40
Grade 4	R				
Grade 4					
Grade 5	S				44
Grade 5	T	Grade 5			
Grade 5	U				
Grade 5					
Grade 6	V				
Grade 6	W	Grade 6			
Grade 6	X				
Grade 6	Y				
Grade 7, 8 and Above	Z	Grade 7, 8			

From the 2009 LLI Program Guide