User Guide

Efficacy of the Core Knowledge Language Arts Listening and Learning Read Aloud Program in Kindergarten through First Grade Classrooms

CKLA Efficacy Study

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Introduction

The Efficacy of the Core Knowledge Language Arts Read-Aloud Program in Kindergarten through First Grade Classrooms Study is a multisite cluster randomized control trial of the Core Knowledge Language Arts Read-Aloud Program and its effects on: growth in vocabulary, listening comprehension, and domain knowledge skills from kindergarten through first grade.

Study participants consisted of students and teachers. This project had two separate studies that took place in two different states with staggered start dates separated by a year. Each study followed the same procedures and implementation for Year 1 with Study 2 following the same students for Year 2. Study sites consisted of classrooms nested within schools within one school district for each study. Randomization to condition occurred at the school level after initial student assessments were completed. Teachers and students were assigned to condition based upon their school.

Site and Teacher Recruitment

The recruitment process for the project was aimed at a population of students in the United States living in suburban and urban areas in the Southeast and Mid-Atlantic states. Study 1 and Study 2 site recruitment involved identified school districts in which an agreement of participation and memorandum of understanding was developed. In Study 1, administrative officials provided a list of selected schools from within the district that could be recruited for the project. Study 2 schools were selected in partnership with the school district administration. District administration and school principals were then invited to recruitment meetings to learn more about the research project and what their school's participation would entail. Interested school principals were asked to sign a School Commitment Letter which confirmed their agreement to participate in the project.

Project staff met with teachers in all participating schools to discuss the goals of the study and answer questions. Kindergarten teachers from the participating schools were recruited and consented for the first year of implementation. First grade teachers were recruited and consented from the original Year 1 participating schools for Year 2 of implementation. All schools' conditions remained the same throughout the study.

Kindergarten teachers from the treatment schools were invited to attend a professional development day where they were given an overview and pertinent implementation information for the CKLA Knowledge Strand. Kindergarten control teachers were asked to refrain from using any CKLA Knowledge Strand. The control teachers were informed that they would receive training and materials the following school year. First grade teachers from the treatment schools were invited to attend a professional development day where they were given an overview and pertinent implementation information for the CKLA Knowledge Strand. First grade control teachers were asked to refrain from using any CKLA Knowledge Strand curriculum. They were informed that they would receive training and materials the following school year.

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Table 1

Number of Teacher Participants Consented and Given IDs Across Each Study and Grade

Number of Teacher Participants by Study and Grade						
Study	Kindergarten Treatment	Kindergarten Control	Kindergarten Total	First Grade Treatment	First Grade Control	First Grade Total
1	24	31	55	0	0	0
2	42	44	86	47	46	93
Overall Total	65	75	141	47	46	93

Student Participant Recruitment

Parent consent forms were sent home by kindergarten classroom teachers to obtain a response from 50% of parents or greater. For Study 2, an option was added to the parent consent form to obtain a Yes or No response to consenting. In addition, we obtained verbal consent from non-responsive parents over the phone (approved by our IRBs), followed by a signed consent form. Consent rates for Study 1 ranged across schools from 23% to 78% (average of 51%), with 693 child consents received. Of those, we randomly selected approximately 10 per classroom, with some oversampling in schools that had one classroom in order to have a good school estimate of performance, for a final child sample of 544. Consent rates for Study 2 ranged across schools from 47% to 97% (average of 72%), with 1000 child consents received. Of those, we randomly selected approximately 10 per classroom, with some oversampling in schools that had one classroom in order to have a good school estimate of performance, for a final child sample of 650.

Student Selection

After teachers were identified and consent was given for study participation, recruitment letters and consent forms were sent home to the parents of each student in their class. Once the desired threshold (60% of each class enrollment) of consent forms was received, the students who returned a yes consent were randomized to determine study participation with an average of 3 teachers per school and 10 students per classroom. The total number of students per school was equal to 30, so the actual number of participants per classroom was dependent on the number of teachers participating per school.

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Table 2

Number of Students by Condition at Project Start

Total Number of Students by Condition at Project Start			
Study	**Treatment Students**	**Control Students**	**Total Students**
1	232	312	544
2	333	317	650

Random Selection and Assignment

Schools were randomly assigned within each district to either the treatment condition or the control (business-as-usual) condition. Study 1 treatment schools implemented the CKLA Knowledge Strand starting in December of the 2017-2018 kindergarten school year. Control schools in Study 1 were given the opportunity to implement the CKLA Knowledge Strand during the 2018-2019 school year after the conclusion of the study. Study 2 treatment schools implemented the CKLA Knowledge Strand beginning in December of the 2018-2019 kindergarten school year. Study 2 treatment schools implemented the CKLA Knowledge Strand during first grade of the 2019-2020 school year. At the appointed time, control schools in Study 2 were given the opportunity to implement the CKLA Knowledge Strand the school year after the conclusion of the study in each grade.

Attrition

Schools and classroom conditions remained consistent throughout the study. In some cases, teachers changed, but classrooms remained in assigned conditions (see Figure 1 and Table 3). Random assignment occurred November 17th, 2017, for study 1 and on November 16th, 2018, for study 2. Students who switched schools, and thus conditions, were analyzed with an intent-to-treat model and were included in analyses within their original condition. Of the 1,194 kindergarten children in both studies, three who initially began in the treatment group moved to the control group, and two from the control group moved to the treatment group. Average student attrition was 7% with 6.4% attrition in the treatment group and 7.7% attrition in the control group (differential attrition of 1.3%), meeting criteria set by the What Works Clearinghouse (WWC) for a tolerable threat of bias under the cautious attrition threshold (What Works Clearinghouse, 2014). Student attrition percentages from the separate studies can be found in Table 4 and Table 6. Of the 141 kindergarten teachers in both studies randomly

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assigned to condition, one teacher moved to another grade, one teacher retired, and three teachers resigned. The percentage of teacher attrition for each study can be found in Table 3 and Table 5. Study 2 first grade attrition numbers for both teachers and students were not able to be determined because of school closures due to COVID-19.

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Figure 1

Study 1 Kindergarten Consort Chart

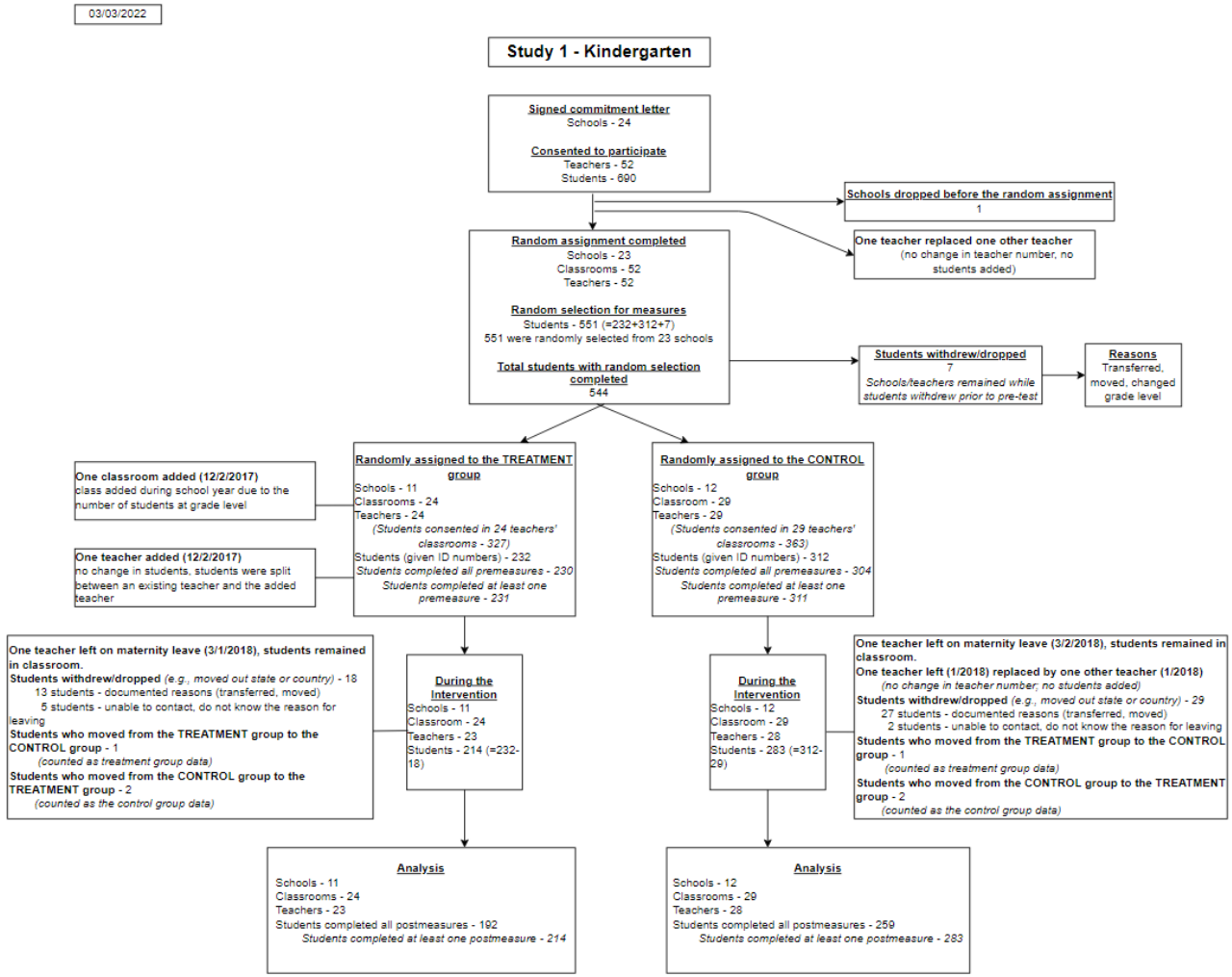

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Table 3

Study 1 Kindergarten Teacher Attrition

Study 1: Kindergarten Teacher Attrition After Random Assignment							
Reason	Stage	Control	Percent Control	Treatment	Percent Treatment	Total	Percent Total
Teacher moved to another grade	During Intervention	1	1.9%	0	0%	1	1.9%

Table 4

Study 1 Kindergarten Student Attrition

Study 1: Kindergarten Student Attrition After Random Assignment							
Reason	Stage	Control	Percent Control	Treatment	Percent Treatment	Total	Percent Total
Transferred or moved from school	During Intervention	27	3.9%	13	1.9%	40	5.8%
Unknown: Unable to contact family for reason	During Intervention	2	0.3%	5	0.7%	7	1.0%

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Figure 2

Study 2 Kindergarten Consort Chart

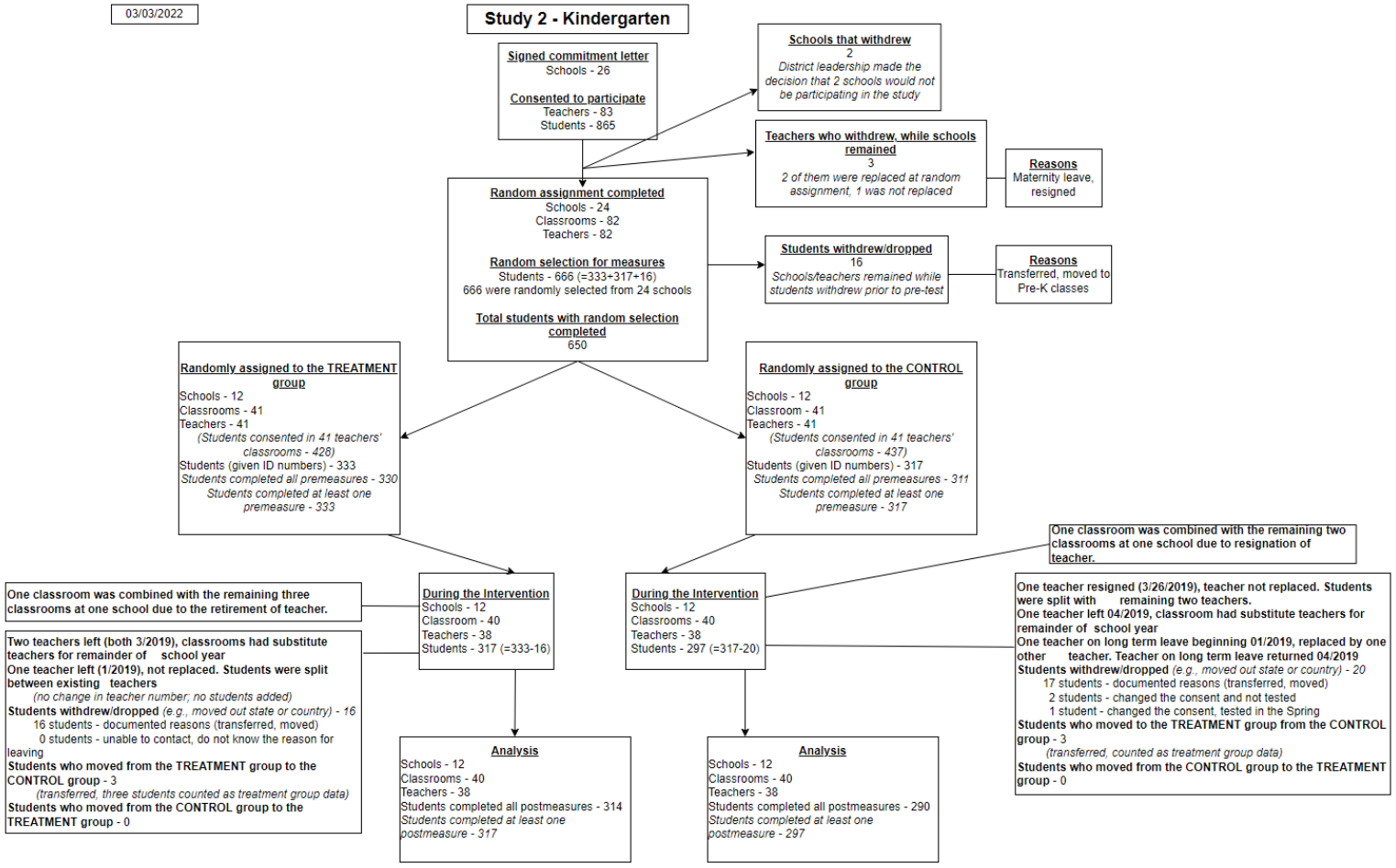

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Table 5

Study 2 Kindergarten Teacher Attrition

Study 2: Kindergarten Teacher Attrition After Random Assignment							
Reason	Stage	Control	Percent Control	Treatment	Percent Treatment	Total	Percent Total
Retirement	During Intervention	0	0%	1	1.2%	1	1.2%
Resigned	During Intervention	1	1.2%	2	2.4%	3	3.6%

Table 6

Study 2 Kindergarten Student Attrition

Study 2: Kindergarten Student Attrition After Random Assignment							
Reason	Stage	Control	Percent Control	Treatment	Percent Treatment	Total	Percent Total
Transferred or Moved from School	During Intervention	17	2.0%	16	1.8%	33	3.8%
Consent for study was withdrawn - reason unknown	During Intervention	3	0.3%	0	0%	3	0.3%

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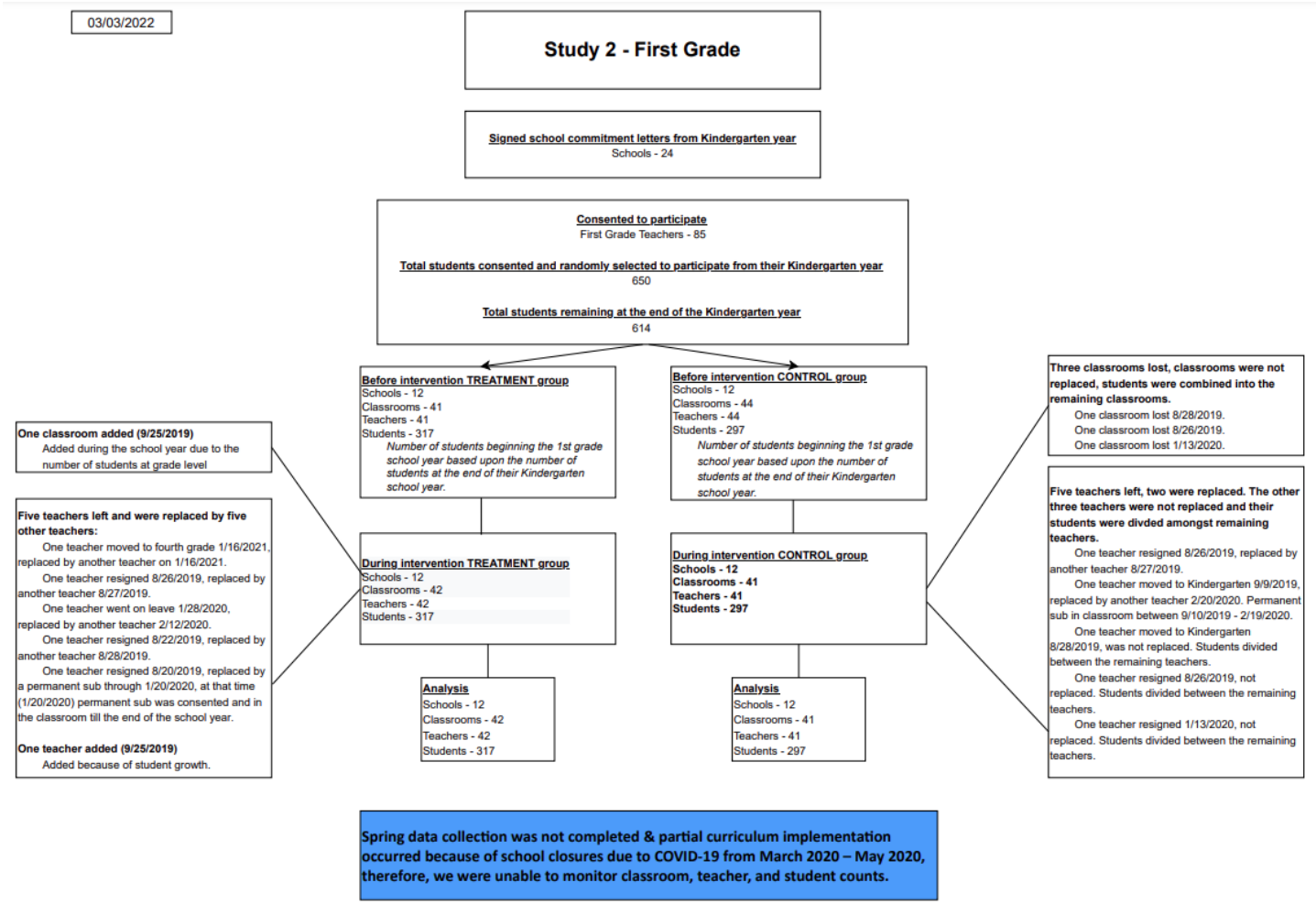
Figure 3

Study 2 First Grade Consort Chart



***Study 2 first grade attrition numbers for both teachers and students were not able to be determined because of school closures due to COVID-19**

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Data Collection

Data Collection Schedule

A common protocol was utilized by trained data collectors and facilitators across both studies for data collection. All students were tested with the same measures regardless of condition. Teacher data collection varied slightly based upon condition. Teachers in the treatment condition were asked additional questions on the survey and were given facilitator ratings during biweekly meetings. The data collected for treatment teachers measured adherence as well as dosage. A data collection overview from the project is specified in Table 7.

CKLA Data Collection Overview

Overall data collection is shown in the table below by study, grade, and wave. The **X** indicates that data was collected for that specific measure and time point. The **–** indicates that no data was collected due to COVID-19 shutdown.

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Table 7

Data Collection Overview

CKLA Data Collection Overview										
Level of Data/ Construct	Measure	Study 1 -Kindergarten			Study 2 - Kindergarten			Study 2 - 1st Grade		
Student		**Pre-test**	**During**	**Post-test**	**Pre-test**	**During**	**Post-test**	**Pre-test**	**During**	**Post-test**
Vocabulary - Receptive	Peabody Picture Vocabulary Test – IV (PPVT)	X		X	X		X			-
Vocabulary - Expressive	Woodcock-Johnson III – Picture Vocabulary Subtest	X		X	X		X			-
Listening Comprehension	Clinical Evaluation of Language Fundamentals – 4th Ed (CELF): Sentence Structure Subtest	X		X	X		X			-
Listening Comprehension	Test of Narrative Language (TNL)	X		X	X		X			-
Domain Knowledge	Curriculum Specific Knowledge Test (CSKT) (author created)			X			X			-
Taught Vocabulary	Curriculum Specific Vocabulary Test (CSVT) (author created) (Proximal)			X			X			-
Domain Knowledge	Woodcock-Johnson III – Academic Knowledge Science & Social Studies Subtests	X		X	X		X			-
Teacher	**All Teachers**									
	Reading Logs		X	X		X	X	X	X	-
	Teacher Survey			X			X			X
	Treatment Condition Teachers									
Lesson Pacing, Teacher Reflectiveness, Teacher Receptiveness	Facilitator Ratings		X	X		X	X	X	X	-
Implementation of CKLA	Teacher Survey addition			X			X			X

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CKLA Data Collection Overview: Videotape Observation										
Level of Data/Construct	**Measure**	**Study 1- Kindergarten**			**Study 2- Kindergarten**			**Study 2- 1st grade**		
Teacher		**Fall**	**Winter**	**Spring**	**Fall**	**Winter**	**Spring**	**Fall**	**Winter**	**Spring**
Fall, Winter, & Spring Read Aloud	SABR 2.2 (Zucker, T. A., Pentimonti, J. P., Tambyraja, S. & Justice, 2018)	X	X	X	X	X	X	X		-
Science or Social Studies Lesson	SABR 2.2 (Zucker, T. A., Pentimonti, J. P., Tambyraja, S. & Justice, 2018)		X			X			X	
Vocabulary Teaching Episodes	VTE	X		X	X		X	X		-
Genre of Books Used for Read-Alouds	Genre Coding	X	X	X	X	X	X	X	X	-
CKLA Implementation	CKLA Fidelity Coding		X			X			X	-

Table 7 Key: ***X****= Collected Data;* **-** *= Data not collected due to COVID-19 shutdown; Blank cell = Data not part of collection plan*

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Study Timelines

Overall study timelines remained consistent but with a staggered start date of a year for kindergarten classrooms. First grade was a continuation of tracking the same kindergarten students through the following year. Teachers in first grade were recruited and assigned to conditions based upon their school's condition from the previous year. Since kindergarten students had been tested in the spring, they were not tested in the fall of first grade. Implementation of the CKLA intervention started at the beginning of the year in first grade, differing from the Kindergarten year implementation which began in December of the project year.

Table 8

Study Timeline

Study Timeline						
	Study 1		Study 2			
	Kindergarten-Treatment	**Kindergarten - Control**	**Kindergarten-Treatment**	**Kindergarten-Control**	**First Grade – Treatment**	**First Grade - Control**
Planning & Prep	July 2016 – June 2017					
Recruitment (Teachers & Students)	Aug 2017 – Sept 2017		Aug 2017 – Sept 2018		Teachers only: April-May & Aug 2019	Teachers only: April-May & Aug 2019
Student Pretest Assessment	10/03/2017 – 12/7/2017		9/05/2018 - 11/01/2018		n/a no pretest testing completed due to following same students tested in spring of kindergarten	
Random Assignment	11/17/2017		11/06/2018		n/a - Teacher condition based on school assignment done for first year of study 2. Student conditions remain the same from kindergarten.	
Implementation	Dec 2017 – May 2018	Dec 2017 – May 2018	Dec 2018 - May 2019	Dec 2018 – May 2019	Aug 2019 – Feb 2020**	Aug 2019 – Feb 2020**
Fall Read Aloud*	Sept 2017 – December 2017	Sept 2017 – Dec 2017	Sept 2018-Dec 2018	Sept 2018-Dec 2018	Sept 2019 – Dec 2019	Sept – Dec 2019
CKLA Curriculum Professional Development	Dec 2017 & Feb 2018	n/a	Nov 2018 & Feb 2019	April 2019 & July 2019	April 2019 & July 2019	n/a

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Study Timeline						
	Study 1		Study 2			
	Kindergarten-Treatment	**Kindergarten-Control**	**Kindergarten-Treatment**	**Kindergarten-Control**	**First Grade-Treatment**	**First Grade-Control**
Science/Social Studies Lesson or read aloud*	March 2018-May 2018	March 2018- June 2018	March 2019- May 2019	March 2019-May 2019	Nov 2019, Jan- March 2020 (partial collection due to COVID-19)**	Nov 2019, Jan-March 2020 (partial collection due to COVID-19)**
Winter Read Aloud*	n/a	Feb 2018-June 2018	n/a	Feb 2019-March 2019	n/a	n/a
CKLA Lesson*	Jan 2018-April 2018 (3 total)	n/a	Jan 2019-April 2019 (2 total)	n/a	Aug-Sept 2019, Jan 2020 & Feb 2020 (3 total)	n/a
Spring Read Aloud*	March 2018-June 2018	March 2018- June 2018	April 2019 -May 2019	April 2019 -May 2019	** not collected due to COVID-19	** not collected due to COVID-19
Teacher Meetings	Dec 2017-May 2018 (2 per month)	Dec 2017, Jan 2018, May 2018 (3 total)	Jan 2019 – May 2019 (2 per month)	Dec 2018, Jan 2019, & May 2019 (3 total)	Aug 2019-Feb 2020 (2 per month) **	Aug 2019 & Jan 2020 **
Reading Logs	Jan 2018-Aug 2018 (5 total)	Jan 2018-Aug 2018 (5 total)	Jan 2019- Aug 2019 (5 total)	Jan 2019- Aug 2019 (5 total)	Sept 2019-Feb 2020 (3 total) **	Sept 2019-Feb 2020 (3 total) **
Student Post Test Assessment	April 2018 to June 2018	April 2018 to June 2018	March 28, 2019 – May 15, 2019	March 28, 2019 – May 15, 2019	** not collected due to COVID-19	**not collected due to COVID-19
Teacher Surveys	April 2018- June 2018	April 2018 – June 2018	April 2019 - June 2019	April 2019- June 2019	May 2020 – June 2020	May 2020 – June 2020

*Video observation collected **Collection impacted by COVID-19 pandemic closures

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Student Data

Measure Descriptions

Students were assessed on all measures of vocabulary and listening comprehension during the six-week pre-intervention window in the fall of their kindergarten school year. In addition, there was one post-intervention data collection window during which students were assessed on all measures of vocabulary, listening comprehension, and domain knowledge in the spring of kindergarten. Trained assessors administered post-intervention student assessments during a six-week window (April/May). The assessment battery was approximately 1 hour in length and assessments were individually administered in a quiet area in the school setting. First Grade post-test measures were not collected because of the school district shutdown in March 2020 due to the Covid-19 pandemic.

In supporting documents for student level files some test booklet pages have been redacted due to copyrighted materials.

Vocabulary - Students were individually assessed on their knowledge of both the target intervention words and general vocabulary knowledge.

Receptive: **Peabody Picture Vocabulary Test** - Students were assessed on their general vocabulary knowledge using the *Peabody Picture Vocabulary Test-Fourth Edition* (PPVT; Dunn & Dunn, 2007). The PPVT is a norm-referenced assessment of students' receptive vocabulary knowledge. The assessment presents four pictures, and the student must identify the picture that best represents the word spoken by the assessor. Internal consistency reliability for the measure is reported at about .96. PPVT developers have worked to eliminate items with bias, ensure diversity in the illustrations with regard to gender and ethnicity, and over sample Hispanic individuals to check differential item functioning.

Expressive: **Woodcock-Johnson III-Picture Vocabulary**- Students were assessed on their general expressive vocabulary knowledge using the Woodcock-Johnson III (WJ-III; Woodcock; McGrew & Mather, 2001) Picture Vocabulary portion of the assessment. Students were shown a series of pictures and asked to name each object to measure their word knowledge. Students were given a raw score based on their performance, which was then standardized for comparison to others in the same age group. This subtest has a median test reliability of .81 (Schrank, McGrew, & Woodcock, 2001).

Listening Comprehension

Clinical Evaluation of Language Fundamentals -4th Ed (CELF) – The Sentence Structure subtest was administered to assess a student's ability to understand spoken sentences

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of increasing length and complexity and select the pictures that illustrate their meaning. Students were read increasingly complex sentences and asked to point to one of the four pictures that demonstrated the meaning of the sentence. Internal consistency reliability coefficients fall within the accepted level and range from .66 to .76 based on student age (Semel et al., 2004).

The Test of Narrative Language (TNL) – The Test of Narrative Language was used to assess a student's ability to tell and understand stories (Gillam & Pearson, 2004). Students were assessed individually on their ability to comprehend and tell stories in three formats: with no picture cues, with five sequenced pictures, and with a single picture. First, they were read a story with no pictures and asked comprehension questions. Next, they were read a story while being shown 5 pictures which follow the story sequence and were asked comprehension questions. The last section consisted of one large picture for reference while a story was read aloud. Students were again asked comprehension questions. Internal consistency reliability estimates are provided for the narrative comprehension, oral narration, and narrative language ability components (e.g., α= .87 for narrative comprehension, α=.76 for oral narration, and α = .88 for narrative language ability).

Domain Knowledge

Curriculum Specific Knowledge Test (CSKT)- Curriculum Specific Knowledge Test is a researcher created curriculum-based measure to assess a student's proximal vocabulary knowledge of domain topics. Students were asked to tell everything they know about 2 domain topics (Plants and Native Americans) from the CKLA curriculum.

Curriculum Specific Vocabulary Test (CSVT) –Curriculum Specific Vocabulary Test is a researcher created curriculum-based measure to assess students' vocabulary knowledge of vocabulary words taught within the domain units of the CKLA curriculum. For each of 15 vocabulary words tested, students were asked two questions that were correctly answered "yes" and two questions that were correctly answered "no."

Woodcock-Johnson III-Academic Knowledge subtest- The domain knowledge of students was measured using the WJ III-Academic Knowledge subtest. Two of the three Academic Knowledge subtests were given that measure Science and Social Studies knowledge. The first section of each subtest requires response by pointing and the remainder of the items require oral responses. Test-Retest correlation for ages 4 to 7 is .84. Internal consistency is .88.

WJ III-Science – The Science subtest assesses information related to biological and physical sciences. First students were asked to identify several pictures or groups that were plants or animals. They were then asked a series of questions

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orally dealing with biological and physical science that became progressively more complex.

WJ III-Social Studies- The Social Studies subtest assesses information related to history, geography, government and economics. Students were first asked to identify several pictures relating to these topics and then asked a series of questions that became progressively more complex about history, geography, government or economics.

Teacher Data

Reading Logs -Teachers completed no more than 6 brief Reading Logs over the course of the school year. For each reading log, teachers were asked the following information: the titles and authors of any books or texts they read aloud that day and the length of time of their read aloud. In addition, the treatment teachers were asked for the domain and lesson number taught.

Videotaped Observations – Videotaped observations were collected by trained videographers and occurred multiple times in treatment and control classrooms. For the purposes of ongoing fidelity observations, treatment classrooms had additional videotaped observations of teachers implementing the CKLA curriculum. SABR and VTE coding systems were utilized for business as usual (normal) read alouds, CKLA implementation read alouds, and science and social studies lessons. All coding schemes evaluated the text read aloud along with any connected before and after activities conducted during the read aloud lesson. The text read aloud was defined as starting when the teacher began discussion related to the text and ended when the teacher transitioned to another activity.

SABR Coding system - The Systematic Assessment of Book Reading (SABR) tool is designed to understand the qualities of classroom-based read aloud sessions (Pentimonti et al., 2021). The tool is designed for use with children and teachers in preschool through first grade classrooms. The modified short-form version used for the CKLA project contains 16 topics/categories that capture before, during, and after reading. These can be used to efficiently code extratextual talk in videotaped read-alouds. These 16 topics/categories are coded through a frequency count, meaning they are coded every time they occur in the video read aloud. Codes capturing child talk include child comments, child questions, and teacher recast/repeat of child talk. Codes identifying teacher talk are captured by type and topic/content. Coding teacher type looks at whether the talk was in the form of a question with modifier codes based on

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the type of question (i.e., auxiliary -fronted yes/no, yes/no, turn-taking, basic wh- , why, and how)

The teacher's talk is coded using three topic/content categories along with modifiers within each category: Behavior codes (redirections or reminders), literacy codes (book/print conventions and letters/words/writing), and meaning codes (cognition, feeling/emotions, define/elaborate on vocabulary, and act out/pretend).

Teacher chosen read alouds were coded as stated above. CKLA curriculum lessons were coded using a modified version of the SABR where the frequency count was divided into teacher initiated and text initiated.

This modified short-form version of SABR also codes seven "Other Observations" with a yes/no check box. If these seven variables are seen at any point in the video, they are accounted for by checking the yes box and are not frequency counted. The variables are author/illustrator reference, predicting future text events, character references, make connections, causal reasoning/problem solving, judgements/opinions, and desires/preferences.

VTE Coding System - The Vocabulary Teaching Episode (VTE) coding system is used to evaluate the quality and characteristics of vocabulary taught during a shared book reading (Hadley et al., 2021). A VTE happens when a teacher gives explicit extratextual verbal information about the meaning of a vocabulary word or helps children to determine the meaning of a word. A VTE contains the explanation of one word, the target word. Coding of a VTE occurs in two phases: 1) VTE capture: determining which words are target words in a VTE and 2) VTE feature: ascertaining the characteristics of the target words.

In Phase 1, Capture, two coders separately watch the same video and look for instances of VTEs. The coders then transcribe the full text of the VTE, starting when the discussion of the target word begins and ending when the discussion of the target word ends. The coder records the start time, stop time and when the VTE occurred (before, during or after the Read Aloud). The target words and their transcriptions captured by the two coders are compared by the lead coder. Discrepancies between capture are resolved through a discussion and target words are agreed upon.

In Phase 2, Feature Coding, coders use the VTEs that were captured and agreed upon in Phase 1 and determine the characteristics of each. VTEs are coded for whether it is teacher-initiated or child-initiated, the part of speech of the target word, whether the target word is used in a way that is general purpose or domain-specific, whether the VTE is basic or extended, whether the teacher used the VTE to make connections to previously taught material, whether the target word definition given in the VTE is

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accurate, and whether the target words captured in one video have conceptual relationships with each other.

Read aloud start and end times for VTE coding are consistent with those used for SABR coding.

Genre Coding - Genre and instructional focus coding determines the genre of texts and what instructional concepts are included in those texts (Pentimonti et al., 2018).

Genre coding was used in this project to analyze the quality of texts read aloud in the classroom and recorded by videotaped lessons, reading logs and guided by the CKLA curriculum. All texts were double coded and both coders resolved discrepancies together.

Each text is researched online on Amazon or Google using both title and author. Coders determine the Genre type by looking at the introduction or a brief description of the book, information in the sample pictures, and any other useful information. Only one genre type will be selected per text.

- Narrative: the purpose is to entertain or share an experience; they include fairy tales, mysteries, fables, personal narratives, or historical fiction, mainly telling stories using characters and events.
- Informational: the goals are primarily to convey accurate information about the natural or social world.
- Mixed: they tell a story with characters and events and convey accurate information about the natural or social world.
- Other: the texts do not fit into the other three genres, examples include poetry collections, menus, instructions, and rules.
- Unknown: the text does not exist in Amazon.com and other online searches or the title is found but too little information is available to code

Coders determine the instructional concepts that are included in the text. Instructional concepts for one text are not mutually exclusive, meaning more than one of these instructional concepts can be chosen for each text.

- Rhyme: rhyme is present on every page or two page spread of the book.
- Alphabet: texts contain prominent alphabet features that could lead to talking about or teaching letters.
- Math: texts include mathematical topics (e.g., patterns, counting, shapes).
- Science: texts include science topics (e.g., physical science, life science, earth and space science, engineering design)
- Social studies: texts contain topics such as families and communities, state and region, culture, history, geography, and economics.

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CKLA Fidelity Adherence – Videotaped observations, collected by trained videographers, occurred multiple times in treatment and control classrooms. Video observations of CKLA implementation in treatment classrooms were coded for fidelity adherence. Shortly following video recording and upload, coders watched each video and completed a brief high-level checklist to quickly identify any important deviations from the curriculum that could be communicated to the teachers by site facilitators and corrected. Detailed fidelity coding was later conducted to quantify the adherence to the curriculum by each teacher. Coders would watch the video and complete a detailed fidelity checklist that provided in-depth information of teacher implementation. The fidelity checklist measured the level of adherence to various aspects of the curriculum as guided by the curriculum.

- Vocabulary words (core and other)
- Setting a purpose for listening
- Check for understanding
- Comprehensive questions outlined in the curriculum
- Child engagement
- Prior learning
- Use of curriculum image cards and flip books
- Accuracy and completeness in reading of curriculum text
- Small group discussions (turn and talk, think pair share)
- Word work
- Time spent on each section (Introduction, Read Aloud, Application)

Overall impressions were noted in:

- Behavior management
- Child engagement

Twenty percent of the detailed fidelity coding was double coded. A video could not be coded if it was not a guided CKLA lesson. Examples of excluded videos are domain assessments, domain reviews, pausing points and culminating activities. After Study 1 fidelity was completed, the coding sheet was modified to add variables for future analysis and to also accommodate coding the 1st grade lessons. No variables were removed, only added.

EOY Survey - At the end of each study year (also school year), teachers were asked to complete the End of Year Survey. The survey collected information pertaining to demographics, efficacy, and instructional practices. The teacher End of Year Survey was designed to enable researchers to better understand current practices in the classroom. This survey measured teacher demographic information, such as age, gender, ethnicity, race, language(s) spoken, years of experience in a classroom, education level, and

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credentialing. It also measured professional classroom characteristics, such as the total number of students, number of students who were English as a second language/dual language learners (ESL/DLL's), number of students with an Individualized Education Plan (IEP), classroom behavior, curriculum type implemented in classroom, time spent in subject areas, types of activities in subject areas, topics/skills taught in subject areas and teacher beliefs and efficacy (measured by the short form of the Teacher's Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001)). In addition, teachers in the treatment group completed questions relating to the implementation of CKLA.

The Teacher EOY surveys were modified from Study 1 and Study 2 Kindergarten to Study 2 First Grade for better data collection as well as to reflect changes due to COVID-19. All changes were IRB approved. Part of the modification was the transition from paper surveys to a qualtrics form. This modification leads to differences in items as well as values for data entry between Study 1 and Study 2 Kindergarten and Study 2 First Grade.

Facilitator Data - Trained facilitators conducted meetings with kindergarten treatment teachers on a bi-weekly basis from January through May. Kindergarten control teachers had two meetings, one in January and one in May. Meetings were also conducted with first grade treatment teachers on a bi-weekly basis from August through May. The April and May meetings did not take place due to the Covid-19 shutdown. First grade control teachers had two meetings, one in August or September and one in December or January.

Teacher Ratings - Treatment teachers were rated after each meeting by their facilitator using a 3-point scale (1=lowest, 2=somewhat, and 3=highest) on their pacing, reflectiveness, and receptiveness. Pacing reflected how the teacher reported lesson pacing in keeping with the pacing guide. Reflectiveness indicated how teachers discussed and reflected on their own practices. Receptiveness indicated how the teacher was responsive and receptive to feedback from the facilitator.

Videotape Observation Procedures - Videographers received training from the project manager on taping procedures, equipment operation and video uploading procedures. Appointments were made with the teachers by the project manager, and videographers were told appointment times and the type of lesson being recorded. Recordings were to start approximately 5 minutes before the lesson and end after the teacher transitioned to the next activity. The length of video recordings varied greatly and was dependent on the type of lesson being recorded. Cameras were to be placed behind the students and facing the teacher, so that

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the majority of the participants were in the frame. After the recordings were completed, the files were uploaded by the videographer directly into the secure cloud location for the research project.

Missing Data

Students

Missing data for students includes missing pre or posttests or partially administered pre or posttests. The reasons for missing student data are as follows. For more information, see student data item level codebooks.

No Administration
1=absent
2=Language barrier
3=No child assent
4=Child asked to stop
5=behavior issue
6=unable to locate
7=student dropped from project
8=unable to pass training

Partial Administration
1=no child assent
2=child asked to stop
3=behavior issue
4=ceiling not obtained
5=basal not obtained
6=skipped items

Additionally, there was an instance where item level data is missing due to a package of completed test booklets being lost by UPS. The raw scores were captured when the test booklet summary pages were scanned prior to mailing.

Teachers

Missing teacher data is indicated by missing flags throughout the datasets. These flags indicate when a video observation was not captured for that teacher for that video type. Sometimes the video content was not codable because there was no read aloud or the audio was not clear. Missing flags are as follows. For more information, see codebooks that pair with video observation type.

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NV= no video
NCC,= no codable content
NVR= no video/refused taping
NSL= no science lesson taught
NAB= before segment not captured
NAA= after segment not captured
NABA= before and after segments not captured

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Table 9a

Coding Schemes Chart – CKLA Fidelity Adherence

Coding Scheme	Data Source	Study	Grade	Inclusionary Criteria	Exclusionary Criteria	Segment of Video Coded	Purpose of Coding Scheme	# Coded / # Possible
CKLA Fidelity Adherence (videos)	CKLA Curriculum	1 & 2	K & 1	Teaching of a CKLA lesson	Anything other than a CKLA lesson; CKLA lessons that were taught as the teacher's science lesson observation	Entire portion of CKLA lesson	Fidelity (Adherence) to CKLA curriculum	S1-K = 52/72 S2-K = 70 /126 S2-G1 = 63 /141

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Table 9b

Coding Schemes Chart – Genre Coding

Coding Scheme	Data Source	Study	Grade	Inclusionary Criteria	Exclusionary Criteria	Segment of Video Coded	Purpose of Coding Scheme	# Coded / # Possible
Genre (teacher videos)	Fall Read-Aloud Videos	1 & 2	K & 1	Both Treatment and Control groups	No read-aloud CKLA lesson	Read-aloud text	Genre & Instructional focus of text	S1-K = 51/55 S2-K = 78/86 S2-G1 = 60/93
Genre (teacher videos)	Winter Read-aloud	1 & 2	K	Control group only	No read-aloud	Read-aloud text	Genre & Instructional focus of text	S1-K = 20/31 S2-K = 40/44 S2 G1 = n/a
Genre (teacher videos)	Spring Read-Aloud Videos	1 & 2	K (1st not collected due to Covid-19)	Both Treatment and Control groups	No read-aloud CKLA lesson	Read-aloud text	Genre & Instructional focus of text	S1-K = 44/55 S2-K = 73/86 S2 G1 = n/a
Genre (teacher videos)	Science Videos	1 & 2	K & 1	Both Treatment and Control groups	No read-aloud or read aloud that was not a science lesson	Read-aloud text	Genre & Instructional focus of text	S1-K =20/55 S2-K = 45/86 S2 G1 =22/93
Genre (teacher videos)	Social Studies Videos	1 & 2	K & 1	S1K- Both treatment and control groups S2G1- Control group only	No read-aloud or read aloud that was not social studies lesson	Read-aloud text	Genre & Instructional focus of text	S1-K =0/55 S2-K =n/a S2 G1 =24/46
Genre (lessons)	CKLA Curriculum	1 & 2	K & 1	Intervention Units for K and 1st	N/A	N/A	Genre & Instructional focus of text	K = 46 /46 G1 = 55 /55
Genre (reading logs)	Reading Logs	1 & 2	K & 1	Both Treatment and Control groups	N/A	N/A	Genre & Instructional focus of text	S1-K = 191/275 S2-K = 367/430 S2-G1 = 163/279

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Table 9c

Coding Schemes Chart – SABR Coding

Coding Scheme	Data Source	Study	Grade	Inclusionary Criteria	Exclusionary Criteria	Segment of Video Coded	Purpose of Coding Scheme	# Coded / # Possible
SABR (videos)	Fall Read-Aloud Videos	1 & 2	K & 1	Contains business as usual text being read aloud to class	No text read aloud	Before, During, and After related to text read aloud	Capture teacher extra-textual talk & child comments surrounding a read-aloud text	S1-K = 50/55 S2-K = 78/86 S2-G1 = 60/93
SABR (videos)	Winter Read-Aloud Videos	1 & 2	K Control Group	Contains business as usual text being read aloud to class	No read-aloud Treatment classroom	Before, During, and After related to text read aloud	Capture teacher extra-textual talk & child comments surrounding a read-aloud text	S1-K = 20/31 S2-K = 39/44 S2-G1 = n/a
SABR (videos)	Spring Read-Aloud Videos	1 & 2	K (1st not collected due to Covid-19)	Contains business as usual text being read aloud to class	No text read aloud	Before, During, and After related to text read aloud	Capture teacher extra-textual talk & child comments surrounding a read-aloud text	S1-K = 44/55 S2-K = 73/86 S2-G1 = n/a
SABR (videos)	Science Lesson	1 & 2	K & 1	Science or social studies lesson that includes a text being read aloud to the students	Lesson not containing a Science or Social Studies text being read aloud	Before, During, and After related to text read aloud	Capture teacher extra-textual talk & child comments surrounding a read-aloud text	S1-K = 20/55 S2-K = 44/86 S2-G1 = 22/93
SABR (videos)	Social Studies Lesson	1 & 2	K & 1	Science or social studies lesson that includes a text being read aloud to the students. Some treatment teachers read aloud a CKLA lesson.	Lesson not containing a Science or Social Studies text being read aloud	Before, During, and After related to text read aloud	Capture teacher extra-textual talk & child comments surrounding a Science or Social Studies read-aloud text	S1-K = 0/55 S2-K = n/a S2-G1 = 24/46

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SABR (videos)	CKLA Curriculum	1 & 2	K & 1	Contains CKLA lesson from manual being read aloud	Other activities not part of the CKLA lesson	Entire portion of CKLA lesson	Capture teacher extra-textual talk & child comments surrounding the read aloud of a CKLA lesson (both teacher generated and scripted)	S1-K = 38/72 S2-K = 69/126 S2-G1 =63/141
SABR (videos)	CKLA Curriculum - Science Lessons	1 & 2	K Treatment teachers	Science Lesson from CKLA Curriculum being read aloud	Other activities not part of the CKLA lesson	Entire portion of CKLA lesson	Capture teacher extra-textual talk & child comments surrounding the read aloud of a CKLA lesson (both teacher generated and scripted)	S1-K = 19/24 S2-K = 11/42 S2-G1 = n/a

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Table 9d

Coding Schemes Chart – VTE coding

Coding Scheme	Data Source	Study	Grade	Inclusionary Criteria	Exclusionary Criteria	Segment of Video Coded	Purpose of Coding Scheme	# Coded / # Possible
VTE (videos)	Fall Read-Aloud Videos	1 & 2	K & 1	Contains text being read aloud to class	No text read aloud	Before, During, and After related to text read aloud	Capture teacher and child initiated extratextual vocabulary taught surrounding a read aloud text	S1-K = 50/55 S2-K = 78/86 S2-G1 = none
VTE (videos)	Winter Read-Aloud Videos	1 & 2	K Control Group only	Contains text being read aloud to class	No text read aloud Treatment classroom	Before, During, and After related to text read aloud	Capture teacher and child initiated extratextual vocabulary taught surrounding a read aloud text	S1-K = 20/31 S2-K = 38/44 S2-G1 = n/a
VTE (videos)	Spring Read-Aloud Videos	1 & 2	K	Contains text being read aloud to class	No text read aloud	Before, During, and After related to text read aloud	Capture teacher and child initiated extratextual vocabulary taught surrounding a read aloud text	S1-K = 44/55 S2-K = 73/86 S2-G1 = n/a
VTE (videos)	Science Lessons	2	K	Science lesson that includes a text being read aloud to the students	Lesson not containing a text being read aloud	Before, During, and After related to text read aloud	Capture teacher and child initiated extratextual vocabulary taught surrounding a read aloud text	S1-K = not coded S2-K = 42/86 S2-G1 = n/a Sci read alouds that were CKLA lessons were not VTE coded
VTE (videos)	CKLA Curriculum	1 & 2	K & 1	Contains a CKLA lesson from manual being read aloud (one per teacher, Plants or Farms domain)	Other activities not part of the CKLA lesson	Before, During, and After related to CKLA lesson read aloud	Capture teacher and child initiated extratextual vocabulary taught surrounding the read aloud of a CKLA lesson (both teacher generated and scripted)	S1-K = 23/24 S2-K = 41/42 S2-G1 = none

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Data Identifiers

CKLA Data Identifiers were created through the following system. There were Identification numbers for Schools, Teachers, Classrooms and Students.

Creation of CKLA Data Identifiers: ID#, School, Teacher, Classroom and Student numbers

Each school has its own unique 3-digit ID.

- Study 1 schools start with a 1. The following 2 digits were chronological and based upon the order of receipt of the signed school commitment letter
- Study 2 Schools start with a 2. The following 2 digits were chronological and assigned based on the alphabetical order of the school name.

Each teacher has their own unique 4-digit ID.

- Study 1 - Kindergarten teachers have a 1 for the 1st digit and a 0 for the 2nd digit, e.g.10xx. The remaining 2 digits were preassigned to each school and then teachers received the preassigned numbers based on order of consent
- Study 2 - Kindergarten teachers have a 2 for the 1st digit and a 0 for the 2nd digit, e.g. 20xx. The remaining 2 digits were preassigned to each school and then teachers received the preassigned numbers based on order of consent.
- Study 2 - 1st grade teachers have a 2 for the 1st digit and a 1 for the 2nd digit, e.g. 21xx. The remaining 2 digits were randomly assigned.

Each classroom has their own unique 5-digit ID.

- Study 1 - Kindergarten teachers have a 1 for the 1st digit and a 0 for the 2nd digit, e.g.10xxx. The remaining 3 digits were preassigned to each school and then teachers received the preassigned numbers based on order of consent
- Study 2 - Kindergarten teachers have a 2 for the 1st digit and a 0 for the 2nd digit, e.g. 20xxx. The remaining 3 digits were preassigned to each school and then teachers received the preassigned numbers based on order of consent.
- Study 2 - 1st grade teachers have a 2 for the 1st digit and a 1 for the 2nd digit, e.g. 21xxx. The remaining 3 digits were randomly assigned.
- Ifthe teacher leaves and is replaced, the classroom ID remains the same

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Each student has their own unique 7 digit ID.

- A linking file spreadsheet was created with a list of all of the ID numbers.
- The ID numbers were created with the 1st three digits identifying the school.
- Each classroom was assigned a predetermined number of ID numbers.
- The last four digits started at 0001 and continued consecutively, so the last four digits were not duplicated.
- As the classroom consent percentage was obtained, the students were randomly selected to participate in the project. Those student names were entered into the linking file in the order of their randomization to one of the ID numbers preassigned to that class.
- Once the ID number was assigned to a student, it was not changed.

As seen in Table 10, there are three schools, six teachers and five classrooms. Five students are selected from each class.

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Table 10

CKLA Data Identifiers

school_id	teacher_id	classroom_id	student_id	Random #
101	1001	10001	1010001	1
			1010002	2
			1010003	3
			1010004	4
			1010005	5
101	1002	10002	1010006	1
			1010007	2
			1010008	3
			1010009	4
			1010010	5
102	1003	10003	1020011	1
			1020012	2
			1020013	3
			1020014	4
			1020015	5
102	1004	10004	1020016	1
			1020017	2
			1020018	3
			1020019	4
			1020020	5
102	1075	10004		
103	1006	10005	1030021	1
			1030022	2
			1030023	3
			1030024	4
			1030025	5

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Datafile Types and Definitions

Raw files contain the original data set. The dataset is original data or data entered into a database from a hard copy. Data collected and recorded on a hard copy, entered and compiled by the Cabell Lab are files that are in Qualtrics, REDcap, SPSS or Excel formats. Raw data files can be exported into a usable but easily handled format.

Master files are de-identified raw data files that have been cleaned into their final format and are ready for analysis.

Linking files contain the data that links the project numbers to the identifying information for each participant (students, teachers, schools, sites). The condition assigned is also included in a linking file. The linking files included in this data archive are deidentified.

All data files are named using the naming convention CKLA data origin_study #_grade_data source__unique dataset detail

- CKLA origin: child or teacher
- Study #: study 1 or study 2
- Grade: K or 1st
- Data source: linking, Coding scheme, survey, assessment data
- Unique dataset detail: item level, task level, read aloud type

Using the Data

Codebooks

The codebooks for this study explain what the data in the datasets means. Codebooks contain all variables, variable labels, and values of the data stored in the variable, and values of the data stored in the variable. These codebooks allow others to completely understand the data, cite it, and reuse it responsibly. There are 2 codebooks: CKLA student level codebook and CKLA teacher level codebook.

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Additional Notes

- Refer to Table 7 for data that was not completed due to COVID-19.
- Additional knowledge questions are found in the treatment teacher's end of year survey (EOY). The answers below are not included in the EOY codebook.
    - *Teacher Knowledge Questions Answers*
        1. *d*
        2. *a*
        3. *b*
        4. *a*
        5. *d*
        6. *b*
- For treatment conditions "domain" and "unit" are interchangeable with respect to the pacing guides
- For access to supporting documents for coding schemes please contact the PI, Sonia Q. Cabell at scabell@fcrr.org

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