

The CIERA School Change Project: Using Research, Data, and Study Groups to Improve Classroom Reading Instruction and Increase Students' Reading Achievement

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Introduction

School reform is at the core of today's educational policy conversation, and most of the talk is about changing primary school reading programs in order to raise student achievement. Schools are offered both rewards (e.g., monetary incentives) and sanctions (e.g., takeover by external management teams) to motivate them to improve achievement by altering programs in the direction of research-based practices. This movement in the direction of research-based practices seems reasonable in light of the fact that we have a considerable body of research on what effective schools and teachers do to promote reading success in the elementary grades. We also possess a great deal of knowledge about successful school reform and the importance of professional development in the school improvement process. The missing piece, however, is knowing how to help struggling schools translate this research into practices that lead to reading success for their students.

The CIERA School Change Project was designed to provide a common framework for change and to help schools translate research on three key topics into school-wide and classroom practices to improve students' reading achievement. Relevant research focused on: (a) schools that are effective in teaching students to read (Hoffman, 1991; Taylor, Pearson, Clark, and Walpole, 2001; Taylor, Pressley, & Pearson, 2002), (b) effective approaches to school improvement (Fullan, 1999; Hawley, 2002), and (c) effective reading instruction and effective teachers of reading (National Reading Panel, 2000; Pressley, 2000; Taylor, Pearson, Peterson, and Rodriguez, 2002). Considering this research, as well as data on school-level and classroom-level practices within their buildings, teachers decided what was most important to focus upon, and through collaborative and reflective professional development, translated findings from research into practice. The logic of the project was that if school staffs could engage in a reading improvement effort that was not only research-based but also grounded in the local school context, they were more likely to be successful in improving reading instruction and, consequently, student achievement.

Research on Effective Schools

Studies of high-performing, high-poverty schools have pointed to important building-level factors that must be in place in order for all children to achieve at high levels in reading. Reviewing five recent large-scale studies on effective, high-poverty elementary schools, Taylor, Pressley, and Pearson (2002) noted six recurring themes, summarized below.

Several studies have noted *improved student learning* as an *overriding priority* in effective schools (Charles A. Dana Center, 1999; Designs for Change, 1998; Lein, et al., 1997; Taylor, et al., 2000). Also, schools reported a collective sense of responsibility for school improvement. Teachers, the principal, other school staff members, and parents worked collaboratively to achieve their goal of substantially improved student learning and achievement.

Consistently, studies also have cited *strong building leadership* as a key factor in effective schools (Designs for Change, 1998; Lein, et al., 1997; Puma, et al., 1997). The principal may have worked to redirect school staff's time and energy, to develop a collective sense of responsibility for school improvement, to secure resources and professional development for teachers, to provide opportunities for teachers to collaborate, to increase instructional time, and to help the school staff persist in spite of difficulties.

In addition to, or perhaps because of, strong leadership, *strong staff collaboration* has been highlighted in studies of effective schools (Charles A. Dana Center, 1999; Designs for Change, 1998; Lein, et al., 1997; Taylor, et al., 2000). Teachers planned and taught together with a focus on how best to best meet students' needs. They reported a strong sense of building communication, talking and working across, as well as within, grades, which con-

tributed to better understanding of one another's curricula and expectations.

Studies of effective schools have stressed *ongoing professional development* and the implementation of new *research-based practices* (Charles A. Dana Center, 1999; Designs for Change, 1998; Lein, et al., 1997; Taylor, et al., 2000). Many of the successful schools emphasized a type of sustained professional development in which teachers learned together within a building and collaborated to improve their instruction.

Teachers in effective schools systematically *share student assessment data*, usually on curriculum-embedded measures, as a part of the process of making instructional decisions to improve pupil performance (Charles A. Dana Center, 1999; Designs for Change, 1998; Lein, et al., 1997; Taylor, et al., 2000). Teachers also worked together to carefully align instruction to standards and state or district assessments.

Effective schools have reported strong efforts to *reach out to parents* (Charles A. Dana Center, 1999; Designs for Change, 1998; Lein, et al., 1997; Puma, et al., 1997; Taylor, et al., 2000). Schools worked to build parents' trust and then developed effective partnerships with them in order to support student achievement. Parents were valued members of the school community. Schools also reported a positive school climate, good relations with the community, and high levels of parental support.

In summary, teachers in effective schools seem to develop a *collective sense of responsibility and determination to improve students' reading achievement*. Furthermore, teachers collaborate in their teaching of reading, are guided by data, and engage in collaborative professional development to improve their reading instruction (Taylor, 2002; Hawley, 2002).

Research on Effective School Improvement and Professional Development

Research on effective school improvement and professional development for teachers is consistent with research on effective schools in general. It has stressed the importance of teachers learning and changing together over an extended period of time as they reflect on practice and implement new teaching strategies (Bryk, Sebring, Kerbow, Rollow, & Easton, 1998; Fullan, 2000; Fullan & Hargreaves, 1992; Louis & Kruse, 1995). Schools that have had successful school improvement efforts typically operate as strong professional learning communities, with teachers systematically studying student assessment data, using the data to modify their instruction and working with colleagues to refine their teaching practices (Fullan, 2000). Reflective dialogue, de-privatization of practice, and collaborative efforts all enhance

shared understandings and strengthen relationships within a school (Louis and Kruse, 1995).

To improve instruction and performance, schools must adopt an attitude of continuous internal improvement (Fullan, 2002) as well as a sense of shared commitment to the process (Newmann, 2002). To help teachers transform their reading instruction, schools must become learning communities (Killion, 2002; Lieberman and Miller, 2002). Valli and Hawley (2002) conclude that to be effective, professional development activities must be school-based, ongoing, and tied directly to teachers' efforts to implement new or revised strategies within the classroom. They suggest two additional features for maximum effectiveness: (a) the use of data on student work, outcome measures and teachers' instruction, and (b) a change process that helps solve problems and move the agenda forward (Valli and Hawley, 2002).

Research on Effective Reading Instruction and Effective Teachers of Reading

Research on effective reading instruction is extensive and has examined both curricular and process variables. Upon reviewing research primarily focused on curricular aspects of reading instruction, the National Reading Panel (NRP) concluded that an effective reading program included the following: direct instruction in phonemic awareness; explicit, systematic phonics instruction; guided, repeated oral reading; direct and indirect vocabulary instruction; and comprehension strategies instruction. Many other sources, such as The Report of the National Academy of Education on Preventing Reading Difficulties in Young Children (Snow, Burns, & Griffin, 1998) and contributors to the Handbook of Reading Research III (Kamil, Mosenthal, Pearson, & Barr, 2000), Handbook of Early Literacy Research (Neuman, & Dickenson, 2001), and Handbook of Research on Teaching the English Language Arts, (Flood, Lapp, Squire, and Jensen, 2003) have corroborated and elaborated upon these findings.

There is also an extensive body of research about effective reading instruction from a long tradition of research on teaching processes and teachers of reading. Summarizing research relevant to reading achievement in the 1970s (Brophy, 1973; Dunkin and Biddle, 1974; Flanders, 1970; Soar and Soar, 1979; and Stallings and Kaskowitz, 1974), Hoffman (1991) concluded that more effective teachers focused on academics, had high numbers of pupils on task, and provided direct instruction that included making learning goals clear, asking students questions as part of monitoring their understanding of what was being covered, and providing feedback to students about their academic progress.

Research on effective reading teachers has focused on the cognitive processes these teachers used. Duffy et al. (1987) found that effective teachers engaged in modeling and direct explanation to teach students strategies they could use to decode words and understand texts. Taylor, Pearson, Clark, and Walpole (2000) found that accomplished primary grade teachers had a pre-

ferred teaching style of coaching as opposed to telling, whereas the reverse was true for less accomplished teachers.

Taylor, Pearson, Peterson, and Rodriguez (in press) found that more effective teachers engaged students in more high-level responses to text (both in discussions and written assignments) as a part of what the researchers labeled a framework of instruction promoting cognitive engagement during reading. In addition to higher level questioning, cognitive engagement involves three additional practices: (a) teaching students word recognition and comprehension strategies to be used during reading, (b) promoting active rather than passive student response activities, and (c) coaching rather than telling as a primary interaction strategy. Taylor et al., (in press) interpreted their findings as reminiscent of the work of Knapp and associates (Knapp, 1995), who found that effective teachers of low income children stressed higher level thinking skills in addition to lower level skills in teaching “for meaning.”

The work of Pressley and his colleagues on exemplary teachers of reading (Pressley, Wharton-McDonald, Allington, Block, Morrow, Tracey, Baker, Brooks, Cronin, Nelson, & Woo, 2001) has stressed the importance of both the curricular and the process aspects of effective primary grade reading instruction. They found that effective primary grade teachers provide a balanced, motivating literacy program in which they teach skills and strategies but also actively engage their students in a great deal of actual reading and writing. Additionally, these teachers fostered self-regulation in students’ use of strategies when reading or writing on their own.

In summary, effective reading instruction includes explicit instruction in phonemic awareness, phonics, vocabulary, and comprehension strategies as well as guided oral reading practice (National Reading Panel, 2000). Effective reading instruction also includes an emphasis on higher level thinking, motivating activities, and a coaching focus to develop students’ self-regulation and independence as learners (Pressley, 2002; Taylor, 2002).

Objectives of the Current Project

In this study, we investigated the effectiveness of a school improvement effort in which K-5 teachers participated regularly in study groups within their buildings to improve their classroom reading instruction and to increase students’ reading achievement. The school improvement effort was both research-based and data-driven. Teachers were encouraged to adopt practices documented as effective in recent research studies. Additionally, teachers received classroom summary data about their own classroom practices; these data were based on an observation protocol built from research on reading instruction. Each school received an individualized school report in the form of a database at the start of each new school year; the report summarized the instructional tendencies at the school in comparison to the entire sample of schools in the study. The purpose of the report was to help the school make decisions about a) where to focus efforts to improve class-

room reading instruction and b) where to make improvement at the school level in practices found to be characteristic of effective schools.

Method

Participants

Nine schools participated in the CIERA School Change Project in 2000-2001, and 2 of these schools had been in the project the previous year as well. The schools were in Connecticut, North Carolina, Iowa, Minnesota, and California. Six of these 9 schools continued with the project in 2001-2002, and 4 new schools joined the project at that time. For this paper, a total of 13 schools were studied, 8 schools in their second year in the project and 5 in their first year. Schools were located in high poverty sites with 70–95% of their students qualifying for subsidized lunch. Seven of the schools were in large urban areas, 3 were in towns of less than 100,000 people, and 3 were in rural areas. Across the 13 schools, 81% of students received subsidized lunches and 20% were English language learners.

At least 75% of the K–5 teachers in a building had agreed by secret ballot to participate in the project. Two teachers per grade were randomly selected for classroom observations and interviews. Within these designated classrooms, teachers were asked to divide their classes into thirds (high, average, and low) in terms of perceived reading ability. Nine children were randomly selected as students to be assessed, 3 from each band of perceived reading achievement. To study the impact of the reform effort on students' literacy growth, we analyzed data on children who had taken the same tests in the fall as in the spring; this required us to eliminate students from kindergarten and grade 1. Thus, this paper focuses on students in grades 2–5, who were assessed in fluency, reading comprehension, and writing performance in October and May.

Student assessments

In the fall, all students were individually assessed in reading fluency. They read aloud for 1 minute to obtain a score for the number of words read correctly, (wcpm, Deno, 1985) in a passage that was one grade level below their grade placement from the Basic Reading Inventory (BRI) (Johns, 1997). In a group setting, students took the reading comprehension subtest of the Gates-MacGinitie Reading Test (MacGinitie, MacGinitie, Maria, & Dreyer, 2000). They also responded to a writing prompt (Michigan Literacy Progress Profile, 1998). In the spring, all children were assessed in fluency on a grade-

level passage (Johns, 1997), reading comprehension (Gates-MacGinitie), and writing, using the same prompt as in the fall.

Each response to the writing prompt was scored according to a 4-point rubric by one person from a team of trained scorers. Twenty-five percent of the writing samples at each grade level were scored by a second scorer, with 83% agreement between the two scorers.

Implementing School Improvement Activities

We recommended that each school form a school leadership team, made up of teachers, the principal, and an external facilitator (who spent a minimum of 8 hours a week in the school). The role of the leadership team was to coordinate the large- and small-group reading improvement activities, using school level data to shape these activities. School improvement activities included large group meetings at least once a month for an hour and hour-long study group meetings three times a month.

Recommended large group activities included discussion and action on issues related to shared leadership, professional development, the school-wide reading program, and parent partnerships. Also, we encouraged schools to have reports from study groups at the large group meeting to foster communication and cross-grade dialogue.

Teachers were expected to meet in within-grade and across-grade study groups that focused on aspects of classroom reading instruction supported by research (e.g., comprehension strategies instruction, phonemic awareness instruction). First, we asked study groups to develop action plans specifying their focus, their activities, completion dates, and how successes of the study group would be measured. Then, we encouraged study group members to engage in a number of the following activities: discussing research-based articles on effective practices for teaching reading, watching and discussing video clips of effective practice, sharing videotapes of their own practice, problem solving, and sharing expertise related to teaching. We encouraged groups to review information on the CIERA School Change website designed for the project. The website contained research summaries on effective reading instruction, effective schools, and effective school reform as well as downloadable articles for teachers to discuss on research-based reading practices related to their study group's focus area. The website also contained video clips of effective practices and suggested study group activities.

Documenting School Characteristics, Reform Effort, and Classroom Practices

School characteristics.

We interviewed teachers in the fall, winter, and spring ,and principals in the fall and spring. We used the interview data to document reading program features and participant beliefs. Each interview lasted about 30 minutes.

To evaluate the degree to which factors previously found to be important in effective schools existed in a school, we applied a 5-factor coding rubric to each set of interviews. The factors were: (a) building collaboration in the delivery of reading instruction; (b) links to parents; (c) reflection and change pertaining to instruction; (d) collaborative professional development; and (e) strong building leadership (and the extent to which this leadership was invested in the teachers, as well as the principal). We designed the 4-level rubric to capture the strength of evidence (from our interviews) suggesting that each factor was present in a school: 0 = very low presence, 1 = low, 2 = moderate, and 3 = high. (Table 1 illustrates the rubric.) One member of the research team coded all of the sets of interviews . A second team member independently coded the interviews from a random sample of 25% of the teachers; the mean agreement on overall rubric scores was 87% across the five factors. We summed the five ratings to generate a school effectiveness score for each school in the study.

Table 1: Rubric for Rating Interview Responses

	0	1	2	3
	LOW			HIGH
Area	Levels			
A. Building Collaboration (perception)	0—Teachers work in isolation or talk only at grade level, some sense of negative climate. 1—Only or mostly grade level talk, ambivalent climate, nothing mentioned about collaboration or a learning community, or it is mentioned only in passing. 2—Some talk across grades, but not a great deal, collaboration is mentioned but not stressed, teachers provide specific examples of how they are collaborating within their building, some sense of positive climate. 3—Cross-grade talk, collaboration on delivery of reading program, on professional development, collaborative learning community, positive climate.			
B. Links to Parents (school's efforts to reach out to parents)	0—Teachers expressed considerable dissatisfaction with parental involvement and little or nothing is being done by the school to facilitate a link with students' home environments. 1—Very little mentioned about parents, or teachers expressed dissatisfaction with parental involvement. 2—Some teachers actively pursue parental involvement in the classroom, mention that parents participate in opportunities offered at school (i.e., library reading program, parent center, site council, school meetings). 3—Includes those activities listed in Medium rating, but also includes a school wide focus, with teachers conducting phone or written surveys, interviews or focus groups to find out parents' concerns, teachers and/or principal calling home at least once a month with good news, as well as to discuss concerns, teachers sending home a newsletter or personal note at least once a week, anything else that the school does to invite parents in as partners.			

Table 1: Rubric for Rating Interview Responses

	0	1	2	3
	LOW			HIGH
C. Instructional Reflection and Change	0—Little or no reflection on instructional practice by the individual classroom teachers, some talk among individual teachers about what is working. 1—Teachers talk and share ideas with each other about what is working in their classrooms during formal meeting times (i.e., grade level meetings) 2—Teachers talk and share ideas with each other in study groups. They may examine student work, reflect on their own instructional practice, and read current research on best practices, but most of their discussions focus on sharing what they do in their own classrooms. 3—Teachers indicate they are intentionally reflecting on their practice and are seriously working with others to improve their practice (i.e., study groups with action plans, grade level meetings to improve instruction), discussion within groups is informed by research on best practices and student assessment data			
D. Views of Professional Development	0—Teachers express dissatisfaction with the quality and quantity of professional development opportunities. 1—Teachers just mention professional development opportunities. 2—Teachers mention professional development opportunities and discuss what they have learned from district workshops, research (CIERA web site, journal articles, etc.) with other staff, there is some sense that teachers are trying to implement new ideas. 3—Professional development is ongoing, teachers have time to discuss, share, reflect on their practice, engage in professional development together across the building = collaborative learning community.			
E. Leadership	0—Teachers express dissatisfaction with their schools and the schools' administration. 1—Teachers express dissatisfaction with their school or may be detached from the problems of their school without taking responsibility for implementing change, teachers express low to moderate satisfaction with the school administration. 2—Some teachers assume instructional leadership in the school, teachers express moderate to high satisfaction with school administration. 3—Includes those activities listed in E2 rating, as well as the following: principal or administrative staff are strong leaders who also get teachers involved in leadership, time is provided for teachers to operate as a collaborative learning community, leadership helps the school use data to reflect on where they are and where they want to be (not just student assessment data, but current research on best practices), teachers express high satisfaction with school administration.			

School reform effort.

We asked teachers meeting in study groups to complete a common study group meeting form after each session and to develop an action plan. We asked the external facilitators to keep brief monthly notes summarizing the activities pertaining to the school change project that had transpired at their school. We also asked them to write an end-of-year report.. Ultimately, we used the data from the notes, action plans, and endofyear reports to document the change process at the school level.

Although schools had agreed, in principle, to the conditions of the study, they exhibited considerable variability in the degree to which they adhered to the school improvement framework. Actions important to the project included the following: (a) meeting for 1 hour three times a month in study groups; (b) meeting in cross-grade study groups; (c) reflecting on teaching in study groups; (d) considering research-based "best practices" in study

groups; (e) completing and being guided by action plans in study groups; (f) selecting substantive topics for study and maintaining topics over time; (g) meeting as a whole faculty once a month to set goals based on data (e.g., school report data, student reading and writing data) and to share study group activities; (h) working on parent partnerships; (i) making effective use of the external facilitator; and (j) having an effective internal leadership team. Using the comments of each teacher across the three interviews, the study group meeting notes, study group action plans, facilitator logs, and the end-of-year reports, we built a scale indicating the degree to which a school was perceived to be implementing the various components of the school change framework (see Table 2). We then calculated a mean reform effort score for each school. One member of the research team rated each school on each of the 10 dimensions of implementing the reform. A second member of the research team also read through the artifacts and rated each school. The Pearson correlation coefficient across the two scorers' ratings was .92.

Table 2: Reform Implementation Rubric

<p>One point was awarded for each of the reform components if the criteria in parentheses for a particular component were judged to be met.</p>
<ol style="list-style-type: none"> 1. Meeting for 1 hour three times per month in study groups (at least 80% of the time). 2. Meeting in cross-grade study groups (at least 80% of the time). 3. Reflecting on instruction and student work (demonstrated at least 80% of the time). 4. Considering research-based practices (demonstrated at least 80% of the time). 5. Being guided by action plans (yes or no). 6. Sticking with substantive topics for 3-4 months or more (yes or no). 7. Meeting once a month as a whole faculty to share and set goals (at least 80% of the time). 8. Working on a plan to involve parents as partners (yes or no). 9. Effective use of an external facilitator (yes or no). 10. Effective use of an internal leadership team (yes or no).

Classroom practices.

On three occasions (fall, winter, spring), we scheduled observations of each teacher who agreed to be part of the data collection sample for an hour during reading instruction time to document his or her classroom practices in the teaching of reading. The observers were retired teachers or graduate students in literacy education who had received training in the use of the CIERA Classroom Observation Scheme, and they were expected to demonstrate at least 80% agreement with a "standard" coding at each of the seven levels of the coding scheme prior to conducting classroom observations (Taylor & Pearson, 2000).

The observation system (influenced by the work of Greenwood, et al., 1995; Scanlon & Gelsheiser, 1992; and Ysseldyke & Christenson, 1993) combined qualitative note-taking with a quantitative coding process. Each observer took field notes for a 5-minute period, recording what was happening in the classroom, including, where possible and appropriate, what the teacher and

children were saying. At the end of the note-taking period, the observer recorded the proportion of children in the classroom who appeared to be on task (i.e., doing what they were supposed to be doing). The observers then coded the three or four most salient literacy events (Category 4 codes) that occurred during that 5-minute episode. For every Category 4 event, the observer also coded who was providing the instruction (Category 1), the grouping pattern in use for that event (Category 2), the major literacy activity (Category 3), the materials being used (Category 5), the teacher interaction styles observed (Category 6), and the expected responses of the students (Category 7). Table 3 provides an example of a 5-minute observational segment. (See Table 4 for a list of the codes for all the categories.) In Table 3, the codes "c/s/r" refer to categories 1–3, and codes "r/n/a/r", "wr/n/c/or-tt", and "v/n/r/or" each refer to categories 4–7.

Table 3: Sample of Observational Notes

9:38—Small group continues. T is taking running record of child's reading. Others reading familiar books. Next, T coaches boy on sounding out "discovered." Covers up word parts as he says remaining parts. T: "Does that make sense?" T: "What is another way to say this part ['cov' with short 'o']?" T passes out new book: My creature. T has students share what the word "creature" means. Ss: animals, monsters, dinosaurs, Dr. Frankenstein. 11/12 OT (On Task)
 c/s/r_ r/n/a/r_ wr/n/c/or tt v/n/r/or tt

Table 4: Codes for Classroom Observations

LEVEL 1: WHO	CODE	LEVEL 2: GROUPING	CODE	LEVEL 3: GENERAL FOCUS	CODE	LEVEL 4: SPECIFIC FOCUS	CODE
Classroom teacher	c	Whole class/large group	w	Reading	r	Reading connected text	r
Reading specialist	r	Small group		Composition/writing	w	Listening to text	l
Special education	se	Pairs		Spelling	s	Vocabulary	v
Other specialist	sp	Individual		Handwriting	h	Meaning of text, lower	
						m1 for talk	m1
						m2 for writing	m2
Student teacher	st	Other		Language	l	Meaning of text, higher	
						m3 for talk	m3
						m4 for writing	m4
Aide	a	Not applicable		Other	o	Comprehension skill practice	c
Volunteer	v			Not applicable	9	Comprehension strategy instruction	cs
No one	n					Writing	w
Other	o					Exchanging ideas/oral prod.	e/o
Not applicable	9					Word ID	wi
						Sight words	sw

Table 4: Codes for Classroom Observations

LEVEL 5: MATERIAL	CODE	LEVEL 6: TEACHER INTERACTION	CODE	LEVEL 7: EXPECTED PUPIL- RESPONSE	CODE	LEVEL 4 CONT'D: SPECIFIC FOCUS	CODE
Textbook, narrative	tn	Tell/give info	t	Reading	r	Phonics p1 = letter sound p2 = letter by letter p3 = onset/rime p4 = multi-syl- labic	p1 p2 p3 p4
Textbook,informa- tional	ti	Modeling	m	Reading turn-tak- ing	r-tt	Word-recognition strategies	wr
Narrative trade book	n	Recitation	r	Orally responding	or	Phonemic aware- ness	pa
Informational tradebook	i	Discussion	d	Oral turn-taking	or-tt	Letter ID	li
Student writing	w	Coaching/scaffold- ing	c	Listening	l	Spelling	s
Board/chart	b	Listening/watch- ing	l	Writing	w	Other	o
Worksheet	s	Reading aloud	ra	Manipulating	m	Not applicable	9
Oral presentation	op	Check work	cw	Other	o		
Pictures	p	Assessment	a	Not applicable	9		
Video/film	v						
Computer	c						
Other	o/9						
Not applicable	9						

Table 5: Description of Classroom Observation Categories Used in Data Analysis

PERCENTAGE OF TIME (5-MINUTE SEGMENTS) CODED
<p>Whole class or large group: All of the children in the class (except for one or two or individuals working with someone else), or a group of more than 10 children. If there are 10 or fewer in the room, code this as a small group.</p> <p>Small group: Children are working in two or more groups. If there are more than 10 children in a group, call this whole group.</p> <p>Narrative text: The number of segments in which a narrative textbook (tn) or narrative trade book (n) was coded out of the total number of segments coded.</p> <p>Informational text: The number of segments that an informational textbook (ti) or information trade book (i) was coded as being used out of the total number of segments coded.</p> <p>Telling: Telling or giving children information, explaining how to do something.</p> <p>Recitation: The teacher is engaging the students in answering questions, or responding, usually low-level q-a-q-a. The purpose primarily appears to be getting the children to answer the questions asked rather than engaging them in a formal discussion or fostering independence in terms of answering questions with more complete thinking.</p> <p>Modeling: The teacher is showing/demonstrating how to do something or how to do a process as opposed to simply explaining it.</p> <p>Coaching: The teacher is prompting/providing support that will transfer to other situations as students are attempting to answer a question or to perform a strategy or activity. The teacher's apparent purpose is to foster independence, to get a more complete thought or action rather than to simply get a student to answer a question.</p>

Table 5: Description of Classroom Observation Categories Used in Data Analysis

PERCENTAGE OF ALL READING SEGMENTS CODED	
Phonemic awareness instruction:	Students are identifying the sounds in words or blending sounds together (an oral activity). The purpose is to develop phonemic awareness, not letter-sound knowledge (e.g., Sound Box technique would be coded as "pa" since the focus is on learning the sounds in words).
Phonics Instruction:	Students are focusing on symbol/sound correspondences (p1) or letter-by-letter decoding (p2) or decoding by onset and rime or analogy (p3), but this is not tied to decoding of words while reading. If students are decoding multisyllabic words, code as p4. The total number of phonics activities out of total number of times reading was coded at level 3 was calculated.
Word-recognition strategies:	Students are focusing on use of one or more strategies to figure out words while reading, typically prompted by the teacher.
Lower-level text comprehension (talk or writing about text):	Students are talking (m1) or writing (m2) about the meaning of text that is at a lower level lower-level of thinking. The writing may be a journal entry about the text or a fill-in-the blank worksheet that is on the text meaning (rather than mechanistic practice on a comprehension skill or vocabulary words). The total number of "low-level text comprehension" activities at level 4 out of the total number of times reading was coded at level 3 was calculated.
Higher-level text comprehension (talk or writing about text):	Students are talking (m3) or writing (m4) about the meaning of text that is engaging them in higher-level thinking. This is talk or writing about text that is challenging to the children and is at either a high level of text interpretation or goes beyond the text: generalization, application, evaluation, aesthetic response. Needless to say, a child must go beyond a yes or no answer (e.g., in the case of an opinion or aesthetic response). The total number of "high-level text comprehension" activities at level 4 out of the total number of times reading (as the major focus) at level 3 was coded.
Comprehension skill practice:	Students are engaged in a comprehension activity (other than a comprehension strategy) that is at a lower level lower-level of thinking (e.g., traditional skill work such as identifying main idea, cause-effect, fact-opinion)
Comprehension strategy instruction:	Students are using a comprehension strategy that will transfer to other reading and in which this notion of transfer IS mentioned (e.g., reciprocal teaching, predicting. If predicting were done, but transfer was not mentioned, this would be coded as c).
Vocabulary instruction:	Students are discussing/working on a word meaning(s).
Active reading practice:	Students are reading (not reading turn-taking) at level 7.
PERCENTAGE OF ALL CODES FOR STUDENT RESPONDING	
Active responding:	Children are engaged in one or more of the following level 7 responses: reading, writing, oral responding, manipulating. The total number of "active responding" codes coded out of the total number of level 7 responding codes coded was calculated.
Passive responding:	Children are engaged in one or more of the following level 7 responses: reading-turn taking, oral responding-turn taking, listening. The total number of "passive responding" codes coded out of the total number of level 7 responding codes coded was calculated.
Time on Task:	At the end of the 5-minute note-taking segment, the observer counted the number of children in the room who appeared to be engaged in the assigned task out of all the children in the room. If a child was quiet, but staring out the window or rolling a pencil on his desk, this was not counted as on task.

Reliability of the
observation codes.

As the first author of this paper visited research sites, she joined each observer in a 30-minute practice observation in order to establish inter-rater reliability data on the observation coding scheme. Across 12 abbreviated observations, agreements with the senior author were as follows: 95% at Level 2 (grouping), 95% at Level 3 (major literacy focus), 82% at Level 4 (specific literacy activity), 87% at Level 5 (material), 85% at Level 6 (teacher response), and 82% at Level 7 (student response).

An expert observer, who had done many classroom observations using this scheme and who had helped to refine it, read through all of the observations to assess the degree to which observers were using the codes in a similar manner. For example, although decision rules had been established in order to help observers distinguish between similar codes, one observer may have

coded a teacher's reference to the main idea of a story as comprehension skill practice, while another observer might have coded a very similar exchange as a higher-level question about the story. The expert observer did not code the observations "blind." Instead, she recorded a different code only if she could not agree with the observer's code after reading the narrative description of a particular 5-minute segment. For a random sample of 10% of the observations, we measured the agreements between the observers and expert observer at each of the levels of coding as follows: 99% agreement at Level 2 (grouping), 100% at Level 3 (major literacy focus), 85% at Level 4 (literacy activity), 99% at Level 5 (material), 86% at Level 6 (teacher response), and 87% at Level 7 (student response). Since the observers and the expert varied in this 10% sample, especially at Levels 4, 6, and 7, we decided to use the expert's codes in all of the observations for those instances in which the observer and expert disagreed in order to ensure maximum consistency across the many observers.

A second expert reviewer, a member of the research team, read through the same random sample of 10% of the observations. The agreement between the first and second expert at each of the levels of coding was as follows: 99% at Level 2 (grouping), 100% at Level 3 (major literacy focus), 86% at Level 4 (literacy activity), 99% at Level 5 (material), 88% at Level 6 (teacher response), 86% at Level 7 (student response).

Using Data to Guide the School Improvement Effort

At the beginning of the first year that a school was in the project, the school received a report highlighting the research on effective reading instruction and effective teachers of reading. This research stressed the value of (a) systematic phonics and phonemic awareness instruction, especially in grades K–1; (b) the application of phonics to reading through use of word recognition strategies; (c) comprehension strategies instruction; (d) higher level questioning; (e) vocabulary instruction; (f) active reading practice; (g) coaching and modeling; and (h) active pupil responses (National Reading Panel, 2000; Pressley, et al., 2001; Snow, Burns, & Griffin, 1998; Taylor, Peterson, Pearson, & Rodriguez, 2002; Taylor, Pearson, Clark, & Walpole, 2000).

At the beginning of a school's second year in the project, the school received a report which included data on their classroom observations, interviews, and reform effort. We encouraged schools to interpret their classroom observation data in light of (a) the research on effective reading instruction and (b) the findings from the HLM analyses from the previous year(s) of the project. These analyses investigated the impact of various classroom practices on students' growth in reading achievement.

We encouraged schools to interpret the school-level data by comparing their mean ratings of shared leadership, collaboration, ongoing professional development, reflection on teaching, and parent partnership with the mean rat-

ings for all schools in the project. Schools were encouraged to reflect on their success in implementing the CIERA School Change Framework by considering whether each of the 10 elements in the reform rubric were rated as in place or not in place in their school.

Feedback to teachers.

Throughout the year, teachers received copies of their observations, a description of the codes used in these observations, and a brief summary of research related to the major observation variables that were analyzed (e.g., incidence of higher-level questioning; incidence of coaching). To help them interpret their own data, they received a table summarizing observation data from teachers in the previous year. We encouraged teachers to go to the facilitators with questions. External facilitators received training in how to interpret observations so that they, in turn, could help teachers understand the information contained in these observations. However, we directed facilitators not to interpret observations for teachers.

Statistical Analyses

At the school level, three variables were used in the statistical analyses: year in study, school effectiveness score, and reform effort score. At the classroom level, variables from the classroom observations (i.e., those found to be important in previous research) were analyzed. These classroom practices included variables pertaining to grouping practices, literacy activities, text type, teacher responses, and student responses. (See Table 5 for the variables and their descriptions.)

We used hierarchical linear modeling (HLM; Bryk & Raudenbush, 2000) to investigate the impact of school-level and classroom-level characteristics on students' reading growth. We also conducted descriptive analyses to elaborate on the quantitative findings.

HLM is a method of completing regression at multiple levels. The analyses in this study employed a three-level HLM model in which students were nested within classrooms, and classrooms within schools. HLM essentially estimates a regression within each classroom and school and combines these to see if they point to a common regression across classrooms and schools. When regressions (either the intercepts or slopes) vary across schools, then we can examine the school-level or classroom-level characteristics that may explain such variation. This is a common method for evaluating school-level and classroom-level factors and their effects on student outcomes. A simple regression would be inappropriate in this situation, since it would assume observations to be independent, which is untenable in this situation because students in the same classroom are influenced by factors within the classroom.

HLM also partitions variance components across levels, providing an estimate of variance in student performance within and among classrooms and schools. An unconditional HLM is one without an explanatory variable that allows us to answer the question: how much variance in student outcome can be attributed to systematic differences among classrooms and schools on specific factors? This analysis is equivalent to a random-effects analysis of variance. Because of the improved estimation enabled by HLM, including the use of maximum likelihood and empirical Bayes estimates, we can broaden interpretation of statistical results to include a larger p-value associated with statistical tests. Furthermore, statistical results with p-values at or near 0.10 should be included in interpretation and explored in further studies with smaller numbers of cases (e.g., with fewer teachers or schools) because such results indicate that there are relationships which merit further exploration. For a more complete description of estimation in HLM, see Bryk and Raudenbush (1992, pp. 32–56). HLM (Raudenbush, Bryk, & Congdon, 2000) is recognized as a standard program for estimating multi-level models (Bryk & Raudenbush, 1992; Kreft & De Leeuw, 1998).

Results

We analyzed results across grades 2–5 since students in these grades had the same measures in the fall and spring. Student scores are in Table 6. Classroom practices by grade are in Table 7.

Table 6: Means and Standard Deviations for Student Scores K-5

ASSESSMENT TOOL/GRADE	N	FALL		SPRING	
		M	SD	M	SD
Fluency:					
Grade 2	174	64.07	35.38	81.53	33.07
Grade 3	200	87.11	33.50	92.12	32.94
Grade 4	183	100.10	35.03	121.99	41.82
Grade 5	176	125.18	37.83	135.16	38.96
Gates Comprehension (NCE)					
Grade 2	169	44.43	17.78	44.11	18.90
Grade 3	199	39.60	17.25	41.02	17.10
Grade 4	180	35.49	17.37	36.58	18.06
Grade 5	175	38.16	16.20	38.54	16.87
Writing					
Grade 2	152	1.49	.70	1.86	.79
Grade 3	169	1.43	1.55	1.53	.60
Grade 4	159	1.37	.51	1.64	.67
Grade 5	127	1.64	.65	1.76	.77

Table 7: Incidence of Classroom Factors by Grade

	GRADE 2		GRADE 3		GRADE 4		GRADE 5		MEAN ACROSS GRADE	
	M	SD	M	SD	M	SD	M	SD	M	SD
N =	23		24		23		22		92	
Percent of segments coded out of all segments coded										
Whole Group	.42	.38	.33	.32	.40	.32	.49	.25	.40	.32
Small Group	.50	.37	.64	.29	.58	.32	.55	.32	.56	.32
Informational Text	.09	.19	.23	.22	.17	.22	.25	.22	.19	.22
Narrative Text	.64	.23	.51	.24	.66	.22	.44	.30	.57	.26
Telling	.60	.19	.64	.17	.64	.19	.73	.18	.65	.18
Recitation	.74	.17	.72	.19	.74	.18	.70	.21	.73	.18
Coaching	.29	.21	.18	.13	.18	.18	.19	.20	.21	.19
Modeling	.08	.13	.06	.09	.08	.09	.07	.08	.07	.10
Percent of segments codes out of all reading segments										
Phonemic Awareness	.05	.07	.01	.05	----	----	----	----	----	----
Phonics Instruction	.11	.12	.04	.08	.06	.02	.04	.09	.05	.09
Word Recognition Strategies	.15	.14	.08	.08	.07	.10	.06	.09	.09	.11
Vocabulary	.29	.18	.27	.19	.29	.16	.29	.20	.28	.18
Comprehension Skill Practice	.12	.10	.18	.17	.13	.12	.17	.17	.15	.14
Comprehension Strategy Instruction	.04	.11	.05	.07	.06	.13	.06	.10	.05	.11
Meaning of Text - Lower Level	.38	.19	.58	.28	.53	.20	.46	.29	.49	.25
Meaning of Text - Higher Level	.10	.11	.20	.18	.22	.15	.22	.22	.18	.18
Percent of responses coded out of total number of Level 7 responses										
Active Responding	.42	.10	.37	.11	.31	.08	.33	.11	.36	.11
Passive Responding	.58	.10	.63	.11	.69	.08	.67	.11	.64	.11

Standardized Comprehension Scores

From the 3-level HLM analysis (Raudenbush, Bryk, & Congdon, 2000) on Gates comprehension NCE scores, after accounting for fall scores, we found that 23% of the variance was among teachers and 10% of the variance was among schools. Reform effort rating was positively related to students' spring standardized reading comprehension scores, accounting for 17% of the between school variance (ES = .29)¹. For every 1-point increase in reform effort score, a school's mean NCE score increased by 1.34. At the classroom level, we found that grade (ES = .36) and the coding of comprehension skill practice (ES = .27)², both negatively related, accounted for 29% of the between teacher variance. For every

increase in grade level, students' mean NCE score decreased by 2.57. For every 10% increase in the coding of comprehension skill practice, a student's mean NCE score decreased by 1.38. (See Table 8).

Table 8: Grades 2-5 Reading Comprehension

INITIAL RANDOM EFFECTS	VARIANCE COMPONENT	% VARIANCE BETWEEN		
Classroom Means	49.72		24	
Classroom Fall Score Slope	.03			
Student Residual	141.11			
School Means	20.68		10	
Total	211.55			
FINAL RANDOM EFFECTS	% VARIANCE ACCOUNTED FOR BY MODEL			
Classroom Means	35.15		29	
Classroom Fall Score Slope	.026			
Student Residual	141.63			
School Means	22.51		17	
FINAL FIXED EFFECTS	COEFFICIENT	t-ratio	df	p-value
Intercept (Grand Mean)	39.57	28.54	11	.000
Reform Effort (school)	1.34	1.80	11	.098
Grade (classroom)	-2.57	-3.63	88	.001
Comprehension Skill Practice (classroom)	-13.78	-2.29	88	.022
Fall Score (student)	.67	19.09	90	.000

Fluency scores

When considering students' fluency scores, after accounting for fall scores and grade, 19% of the variance was among teachers and 22% among schools. Reform effort accounted for 35% of the between school variance (ES = .38).

1. Unless otherwise noted, we calculated the effect size by dividing the coefficient of the predictor variable in the final model by the standard deviation (square root of the variance component) of the appropriate classroom, student, or school mean in the base model. For example, the effect size for reform effort accounting for spring reading comprehension scores was calculated as $1.34/4.56 = .29$.

2. Since the observation scores were a ratio, ranging from .00 to 1.00, we calculated the effective size for a significant classroom observation variable in terms of 1 standard deviation of change in that classroom observation variable. This was our approach to calculating effect size for all significant classroom observation variables. For example, we calculated the effect size for comprehension skills accounting for spring reading comprehension scores as $(13.78/7.05)/.14 = .27$. According to the National Reading Panel Report (2000), an effect size of 0.20 is considered small, 0.50 is moderate, and 0.80 is large.

For every 1 point increase in reform effort score, students' mean wcpm score increased by 4.87. High-level questioning (positively related, $ES = .26$) and comprehension skill practice (negatively related, $ES = .31$) accounted for 15% of the between teacher variance. For every 10% increase in the coding of higher level questioning within a classroom, students' mean fluency score increased by 1.75. For every 10% increase in the coding of comprehension skill practice within a classroom, students' mean fluency score decreased by 2.23 (See Table 9).

Table 9: Grades 2-5 Reading Fluency

INITIAL RANDOM EFFECTS	VARIANCE COMPONENT	% VARIANCE BETWEEN		
Classroom Means	144.92	19		
Student Residual	412.10			
School Means	163.69	22		
School Grade Slope	24.43			
Total	786.19			
FINAL RANDOM EFFECTS	% VARIANCE ACCOUNTED FOR BY MODEL			
Classroom Means	122.59	15		
Student Residual	412.25			
School Means	105.71	35		
School Grade Slope	27.28			
FINAL FIXED EFFECTS	COEFFICIENT	t-ratio	df	p-value
Intercept (Grand Mean)	106.41	33.49	11	.000
Reform Effort (school)	4.87	3.90	11	.003
Grade (classroom)	17.97	9.11	12	.000
High Level Questioning (classroom)	17.49	1.81	88	.070
Comprehension Skill Practice (classroom)	-26.26	-2.35	88	.019
Fall Score (student)	.82	34.14	727	.000

Writing

When considering students' writing scores, 32% of the variance was among teachers and 4% among schools. No school-level variables were found to contribute to the between school variance. Coaching (positively related) accounted for 11% of the between teacher variance ($ES = .38$). For every 10% increase in the coding of coaching within a classroom, students' mean writing scores (based on a 4-point rubric) increased by 0.80. (See Table 10).

Table 10: Grades 2-5 Writing

INITIAL RANDOM EFFECTS	VARIANCE COMPONENT	% VARIANCE BETWEEN		
Classroom Means	.164	32		
Student Residual	.304			
School Means	.023	4		
School Fall Score Slope	.025			
Total	.517			
FINAL RANDOM EFFECTS	% VARIANCE ACCOUNTED FOR BY MODEL			
Classroom Means	.146	11		
Student Residual	.304			
School Means	.025			
School Fall Score Slope	.025			
FINAL FIXED EFFECTS	COEFFICIENT	t-ratio	df	p-value
Intercept (Grand Mean)	1.69	24.64	10	.000
Coaching (classroom)	.80	2.39	76	.017
Fall Score (student)	.28	4.04	10	.003

Growth Curve Analysis to Investigate Change in Students’ Performance

Eight schools were in the project for 2 years, and approximately one third of the students across 8 schools were in the study for 2 year s. By employing the four time points across two year s, we fit a three-level HLM to the data, where time points were nested within students, and students were nested within schools. This allowed us to estimate an intercept (performance level in fall of Year 2) and a slope (growth rate across the four time points).

For Gates comprehension results with students in grades 2–5, we used an unconditional model to estimate the intercept at 41.7 NCEs (fall, Year 2³) with an average slope of 0.23 NCEs per time point (See Table 11). Both the intercept and slope of the growth curves varied significantly among schools. For reading comprehension, we found that 6% of the variance in fall Year 2 status was between schools and 15% of the variance in growth across 2 years was between schools. Grade had a significant relationship with student intercepts, where higher grades performed at a slightly lower level (-3.03 NCEs, $p = 0.001$). Reform effort scores explained a significant amount of variation in growth curve slopes (65% of the variation among schools was explained, $ES = .49$; see Table 12). On average, one point on the reform effort scale increased the growth slope by 0.63 NCEs per time point; in two years, one additional point in reform effort is associated with 2.5 NCEs additional growth.

³. Because of some missing data, which HLM can accommodate, we chose fall of Year 2 as the centering point for the intercept.

Table 11: Grade 2-5 Growth Curve Analysis - Reading Comprehension

INITIAL RANDOM EFFECTS	VARIANCE COMPONENT	% VARIANCE BETWEEN		
Student Status Fall Year 2	190.04			
Student Growth Slope	9.49			
Student Residual	88.37			
School Status Fall Year 2	17.93		6%	
School Growth Slope			15%	
Total	296.34			
FINAL RANDOM EFFECTS		% VARIANCE ACCOUNTED FOR BY MODEL		
Student Status Fall Year 2	179.83		5%	
Student Growth Slope	9.36			
Student Residual	88.25			
School Status Fall Year 2	18.71		65%	
School Growth Slope	.576			
FINAL FIXED EFFECTS	COEFFICIENT	t-ratio	df	p-value
School Status	41.74	22.87	7	.000
Grade	-3.03	-3.64	239	.001
School Growth	.23	.47	6	.652
Reform Effort	.63	3.00	6	.026

We found a similar result with the reading fluency measure. (See Table 12). The average intercept (average wcpm, fall Year 2) was 97.2 with an additional 20.8 wcpm for each additional year in grade (from 2 to 5). The average growth slope was 12.5 per time point with a slight decrease in growth rate for each additional grade of 1.6 wcpm (fluency in earlier grades grows faster). Both the intercept and growth slope varied significantly among schools. Reform effort scores were a reasonable explanatory variable, indicating an increase in wcpm of 0.78 per time point; in two years, one additional point in reform effort is associated with 3.1 wcpm growth in addition to the mean growth slope of 12.5 wcpm ($p = 0.07$, $ES = .41$; see Table 13). The estimated variance appears to have increased in the final model, suggesting that the addition of the reform effort score created greater spread in school growth rates; however, reform effort was modestly statistically significant in the model ($p = 0.074$). In addition, the model fit index suggested that the inclusion of reform effort improved the fit to the data (chi-square = 3.9, $df = 1$, $p < 0.05$).

Table 12: Grade 2-5 Growth Curve Analysis - Reading Fluency

INITIAL RANDOM EFFECTS	VARIANCE COMPONENT	% VARIANCE BETWEEN		
Student Status Fall Year 2	717.75			
Student Growth Slope	16.09			
Student Residual	290.25			
School Status Fall Year 2	162.90			
School Growth Slope	3.56			
FINAL RANDOM EFFECTS		% VARIANCE ACCOUNTED FOR BY MODEL		
Students Status Fall Year 2	713.55			
Student Growth Slope	15.17			
Student Residual	290.49			
School Status Year 2	168.50			
School Growth slope	4.35			
FINAL FIXED EFFECTS	COEFFICIENT	t-ratio	df	p-value
School Status	97.20	19.45	7	.000
Grade	20.83	12.57	239	.000
School Growth	12.52	12.38	6	.000
Grade	-1.57	-2.52	239	.012
Reform Effort	0.78	2.16	6	.074

To look at changes in students’ reading scores by reform effort, we categorized schools as high, medium, or low reform effort schools. We designated 5 schools with a reform effort rating score of 5, 6, or 7 as high reform effort (HRE) schools. We designated 3 schools with a reform effort rating of 4 as moderate reform effort schools, and 5 schools with a reform effort rating of 1, 2, or 3 received a low reform effort (LRE) designation. The high, medium and low reform effort schools did not vary greatly in terms of percentage of students on subsidized lunch (81, 73, and 87 percent, respectively) or percentage of ELL or minority students (16, 16 and 25 percent, respectively). There were 4 high reform effort schools and 3 low reform effort schools in the project for 2 years. There was only 1 medium reform effort school in the project for 2 years; hence, it was not considered further. When looking at the students who had been assessed for two years in the high and low reform effort schools, we found that the mean Gates NCE scores for students in the high reform schools increased, on average from Year 1 to Year 2, whereas the mean scores for students in the low reform effort schools decreased, on average (Table 13).

Table 13: Mean Standard Comprehension Scores in High and Low Reform Schools for Students in First and Second Year in Study

GRADE IN YEAR 2	N	YEAR 1 MEAN GATES NCE		YEAR 2 MEAN GATES NCE	
		M	SD	M	SD
2 HRE	20	52.10	16.47	48.00	16.78
2 LRE	16	47.44	16.07	45.41	9.65
3 HRE	33	44.77	15.43	46.14	17.83
3 LRE	11	32.14	29.44	27.82	8.15
4 HRE	28	36.73	14.00	38.89	14.41
4 LRE	17	36.11	10.78	32.18	16.11
5 HRE	28	40.02	15.50	42.20	13.77
5 LRE	17	35.94	18.29	35.09	13.89

Summarizing Across HLM Findings

Looking across grades 2–5, we see a number of findings that converge with our earlier research as well as the research of others. At the classroom level, we found that higher level questioning contributed to the between teacher variance in students' fluency scores in grades 2–5, whereas rote comprehension skill practice (which was coded separately from comprehension strategy instruction) was negatively related to both reading comprehension and fluency growth in grades 2–5. Similar findings on the importance of higher level questioning were reported in our earlier related studies (Taylor, et al., 2002; Taylor, et al., in press; Taylor, et al., 2000) as well as in other research (Knapp, 1995).

The NRP found that comprehension strategy instruction, as opposed to comprehension skill practice, was important for students' reading growth. However, we saw such low levels of comprehension strategy instruction (see Table 7) that it is not surprising it did not emerge as a significant factor in the HLM analyses conducted. We also found in earlier work that a relatively high level of comprehension skill practice was negatively related to reading comprehension growth in grades 2–5 (Taylor, et al., in press). A logical explanation for this relationship is that high amounts of mechanistic practice on comprehension skills is taking time away from other important comprehension activities such as higher level talk about text and use of comprehension strategies during reading.

Coaching was positively related to writing growth in grades 2–5. This finding is related to earlier work in which coaching was found to benefit students' reading growth (Taylor, et al., 2000; Taylor, et al., in press). The importance of coaching has also been highlighted by Pressley, et al. (2001).

Perhaps most important, reform effort significantly contributed to the rate of students' growth in reading comprehension and fluency across 2 years. In examining within-year results, we found that the reform effort contributed to school level variance in students' spring reading comprehension and fluency scores, after accounting for fall scores.

Differences in Reform Effort Across Schools

To more fully understand the impact of reform effort, we looked at differences across HRE and LRE schools in implementation of the reform and in perceptions of school effectiveness. We also looked at schools in the project for 2 years to consider changes in teachers' practices while teaching reading.

Using the reform effort ratings (see Table 14), we conducted tests comparing the number of HRE and LRE schools determined to be engaging in various reform practices, setting the alpha level at .01 since multiple t-tests were performed (we followed this procedure throughout.) Analyses revealed that more HRE schools than LRE schools were doing the following: sticking with a substantive study group topic for at least 3–4 months ($t(8) = 4.00, p = .004$), meeting once a month to share study group activities ($t(8) = 4.00, p = .004$), and utilizing an effective internal leadership team ($t(8) = 4.00, p = .004$).

Table 14: Reform Effort Ratings

REFORM EFFORT VARIABLE	PERCENT OF HIGH REFORM EFFORT SCHOOLS (N = 5) DEMONSTRATING THIS REFORM VARIABLE	PERCENT OF LOW REFORM EFFORT SCHOOLS (N = 5) DEMONSTRATING THIS REFORM VARIABLE
Meeting for 1 hour 3 times per month in study groups	80	20
Meeting in cross-grade study groups	40	20
Reflecting on instruction and student work	60	0
Considering research-based practices	40	0
Being guided by action plans	20	0
Sticking with substantive topics for 3–4 months or more	80*	0
Meeting once a month as a whole faculty to share, etc.	80*	0
Working on a plan to involve parents as partners	40	0
Effective use of external facilitator	40	60
Effective use of internal leadership team	100*	20

* $p = .004$

Study group topics identified as substantive included research-based reading practices shared with teachers at the beginning of the school year. For example, teachers were encouraged to increase their use of higher level questioning, their teaching of comprehension strategies, or their application of phonics to the reading of connected text. (Also see page 14). Additionally, in HRE schools, large groups met regularly to share study group successes and to deal with school-wide issues pertaining to literacy.

Among leadership teams rated as effective, the leader was typically a teacher who was very knowledgeable about reading and whom the other teachers respected. Other members of effective leadership teams encouraged teachers to continue to meet in study groups, helped to run study group meetings, and met regularly to discuss the progress of study groups and to solve problems.

All HRE schools had effective internal leadership teams; however, only two schools had an external facilitator who worked at the school regularly, despite our recommendation that such a person be in place. One school did not have the funds for an external facilitator, and 2 schools that shared an external facilitator saw relatively little of this person since the district had assigned her to work with 2 other schools as well.

The school effectiveness rating did not enter into any of the HLM3 models as a school-level factor contributing to students' literacy growth. However, an independent t-test revealed that teachers in HRE schools had more positive comments about their professional development than teachers in LRE schools, $t(9) = 3.67, p = .01$ (see Table 15). This is not surprising because teachers in the HRE schools were sticking with substantive topics over time in study groups whereas in the LRE schools teachers were not. It is likely that teachers in the HRE schools felt their study group work was sustained and valuable, whereas teachers in the LRE schools may have sensed that their study group work was unfocused and/or on unsubstantial topics. That being said, the mean ratings for professional development and reflection on practice in study groups in the HRE schools were 1.9 (SD = 0.2) and 1.9, (SD = 0.3), respectively, on a scale ranging from 0 – 3. This suggests that, even in the schools doing the best job of implementing study groups, there was still more that schools could do to become collaborative learning communities in which teachers were reflecting on practice and working together to improve instruction.

Table 15: Summary Data from the Teacher Interviews and Descriptions of Categories Analyzed

TEACHER PERCEPTIONS	MEAN RATING FOR HRE SCHOOLS (BASED ON 4-POINT RUBRIC, WHERE 0 = LOW AND 3 = HIGH)		MEAN RATING FOR LRE SCHOOLS	
	M	SD	M	SD
Links to Parents	1.40	.45	1.55	.32
Collaboration	1.83	.24	1.46	.73
Professional Development	1.90*	.18	1.41	.27
Reflection on Teaching	1.87	.27	1.37	.43
Collaborative Leadership	1.72	.32	1.44	.43
Total	8.72	1.32	7.22	2.03

*p=.01

Changes in Teaching Practices across High Reform Effort and Low Reform Effort Schools

Since we decided that 3 observations per year did not provide enough data to examine within-year changes in instructional practice, we examined cross-year changes in the schools that had been in the reform effort for 2 years. Unfortunately, some, but not all, of the same teachers within these schools were observed in both Year 1 and Year 2. Thus, we were unable to statistically compare changes in teaching practices within HRE and LRE schools across the 2 years. Nevertheless, looking at this data descriptively, we saw that teachers in the HRE schools were observed doing more high level questioning, coaching, modeling, and requiring more active responding from students in Year 2 than in Year 1. In LRE schools, teachers were observed doing more coaching in word recognition strategies but doing less vocabulary instruction, modeling, coaching, and requiring less active responding from students in Year 2 than in Year 1.

Although we were not able to statistically compare changes in teaching practices of all teachers in HRE or LRE schools from Year 1 to Year 2, we were able to look at the teaching practices of a subset of teachers in HRE and LRE schools who had actually been observed in both Year 1 and Year 2 (see Table 17). Using paired t-tests for each group, we found that the HRE teachers increased their use of coaching from Year 1 to Year 2, $t(17) = 3.46, p = .003$. We did not find significant differences from Year 1 to Year 2 for the LRE teachers.

We also considered differences between HRE and LRE teachers in Year 1 and in Year 2. Using independent t-tests, we found that teachers in HRE schools were observed asking significantly more high level questions in Year 2, $t(50)$

= 2.62, $p = .01$, than teachers in LRE schools. Teachers in HRE schools were observed doing significantly more modeling in Year 2 than teachers in LRE schools, $t(50) = 3.54$, $p = .001$ (see Table 16).

Table 16: Mean Incidence of Classroom Factors* for All Teachers Observed by High (HRE) and Low Reform Effort (LRE) Schools and Year in Study for Grades 2-5

	N =	HRE Year 1		HRE Year 2		LRE Year 1		LRE Year 2	
		31		31		23		21	
		M	SD	M	SD	M	SD	M	SD
High Level Questioning		.21	.16	.25**	.22	.11	.14	.11	.15
Comprehension Strategies		.10	.15	.06	.12	.08	.10	.04	.07
Vocabulary		.27	.20	.28	.17	.30	.29	.24	.17
Word Recognition Strategies		.10	.13	.07	.09	.08	.10	.10	.14
Coaching		.12	.06	.24	.03	.18	.15	.16	.11
Modeling		.04	.05	.07***	.08	.08	.07	.01	.03
Active Responding		.28	.12	.36	.11	.38	.20	.36	.13

*Research that was shared with teachers recommended increasing incidence of this practice.

** HRE Year 2 > LRE Year 2, $p = .01$

*** HRE Year 2 > LRE Year 2, $p = .001$

Table 17: Mean Incidence of Classroom Factors* by High (HRE) and Low Reform Effort (LRE) Schools and Year in Study for Grade 2-5 Teachers Observed for Two Years

	N =	HRE YEAR 1		HRE YEAR 2		LRE YEAR 1		LRE YEAR 2	
		18		18		10		10	
		M	SD	M	SD	M	SD	M	SD
High Level Questioning		.19	.15	.28	.26	.10	.12	.15	.23
Comprehension Strategies		.08	.09	.05	.12	.04	.04	.02	.05
Vocabulary		.26	.23	.32	.15	.20	.17	.26	.17
Word Recognition Strategies		.08	.07	.09	.11	.16	.14	.10	.14
Coaching		.11	.12	.27**	.18	.11	.13	.18	.21
Modeling		.03	.03	.04	.06	.04	.07	.02	.04
Active Responding		.29	.11	.36	.12	.34	.24	.29	.11

*Research shared with teachers recommended increasing incidence of this practice.

** HRE Year 2 > LRE Year 2, $p = .003$

Collectively, these findings suggest that the teachers in the HRE schools were making more of an effort than the teachers in the LRE schools to look at the data on their teaching practices and to use effective teaching practices or to change their reading instruction in the directions suggested by the research. However, in neither high nor low reform effort schools did the incidence of comprehension strategies instruction increase. This latter finding is somewhat puzzling, given the research on the importance of comprehension strategies instruction. One explanation is that comprehension strategies instruction is difficult to provide (Pressley, 2002).

A Description of One High Reform Effort School

To provide a more vivid picture of what reform looked like in these schools, we describe the process of one high reform effort school, Howard Elementary (a pseudonym), over the two years of the project. Howard Elementary School was in a large urban area in which 81% of the students qualified for subsidized lunches and 78% of the students were English language learners. We offer this description to illustrate how the study group process, along with the use of student data, may have contributed to the changes in classroom teaching practices that were observed. This in turn may have led to the increased reading growth at Howard from the first year of the project to the second. Our language is tentative because we are mindful of the difficulty in attributing causal connections between changes in practice and changes in student performance. Plausibility, not causality, is the goal of this description.

During the first year in the project, the teachers at Howard selected study groups, only some of which were directly influenced by the research report on effective reading instruction the school had received at the beginning of the year. Study groups focused on the following topics: guided reading, reading comprehension, reading assessment, reading interventions within the classroom, higher level questioning, and refining coaching and modeling abilities. All of the topics, except for the last two, were very broad. Also, meeting notes and facilitator log entries suggested that learning how to be productive in study groups took up a fair amount of teachers' energy in the first half of the first year.

During the second year of the project, as compared to the first year, teachers at Howard were more focused on specific instructional strategies to improve reading comprehension because their school report and district-level data indicated that this was their biggest challenge area. Teachers spent the first half of the year in cross-grade study groups learning how to teach children to use thinking maps to summarize what they read. During the second half of the year, teachers met in cross-grade study groups that focused on additional strategies to improve students' comprehension. For example, one group refined their use of the DRTA routine (Blachowicz & Ogle, 2001). Another group learned how to teach students to use SAIL (Brown, Pressley, Van Meter, & Schuder, 1996). A third group worked on developing challenging independent seatwork activities to foster reading comprehension, while yet another focused on vocabulary instruction to improve reading comprehension.

Studying the classroom teaching practices of the 5 teachers at Howard who were observed in both Year 1 and Year 2, we found that they made changes in their teaching practices in the directions suggested by the research (see

Table 18). When considering these 5 teachers, we found that 3 of 5 were observed doing more high level questioning, 2 of 5 did more comprehension strategies instruction, 2 of 5 did more coaching, and 4 of 5 had their students engaged in more active responding in Year 2 as compared to Year 1. To illustrate teachers' changes in teaching practices at Howard, we describe 2 of the 5 teachers below who were observed in each year of the project.

Table 18: Percent of Segments in Which Teaching Practice Observed by Teachers at Howard Who Were Observed for 2 Years

	TEACHER									
	A-GRADE 2		B-GRADE 2		C-GRADE 3		D-GRADE 3		E-GRADE 5	
	YEAR		YEAR		YEAR		YEAR		YEAR	
	1	2	1	2	1	2	1	2	1	2
Higher Level Questioning	15	83	29	8	9	9	0	63	28	47
Comprehension Strategies	11	0	19	46	9	0	27	13	0	5
Vocabulary	22	67	24	8	100	45	59	38	17	23
Word Recognition Strategies	7	17	24	0	9	9	18	13	0	0
Coaching	21	38	33	54	0	6	13	38	0	13
Modeling	2	0	6	0	4	6	0	13	11	13
Active Responding	39	52	49	51	15	19	40	41	27	40

Mrs. Lopez (Teacher B; all names are pseudonyms) was a second grade teacher in the higher level thinking study group during the first year in the project and in a thinking map study group and the SAIL study group during the second year. We contrast two observations, one from the fall of Year 1 and a second from the spring of Year 2. In fall of the first year, as she was reading with a group of 4 students, she would stop at predetermined places in the story that she had marked for the children with post-it notes. Typically, her questioning was at a fairly low level. "Why is Joe so surprised? How do you know that? What else was he surprised about? What happened at night?" Then the teacher asked the students to continue reading.

In spring of the second year, Mrs. Lopez's questioning with a small group looked very different, and she emphasized the use of reading strategies. Also, the students were doing more of the work for themselves in the second year than in the previous year since the teacher was now doing less recitation and more coaching. For example, as Mrs. Lopez was working with a small group, the students started their reading of a new story about spiders by doing a picture walk on their own. Then, after they chorally read the first page, they each completed a story map independently with support from their teacher. At the end of the second page, a student, without being prompted by the teacher, pointed out that there wasn't a problem so far to put on the map; just the characters and setting had been described. The students continued reading on their own, and then, as a group, they identified the problem of the story. At the end of the lesson, the teacher reminded stu-

dents that a story map helped them remember the important parts of a story, and they could use the strategy when they were reading on their own. As the group went back to their seats, a child proudly went up to show the teacher a strategy he had used while reading on his own. He had written this strategy on a post-it note so he wouldn't forget to share it with his teacher.

Ms. Gray (Teacher D) was a third grade teacher in the reading comprehension study group during the first year and the thinking maps and SAIL study groups in the second. During the beginning of the first year, Ms. Gray's lessons were fairly teacher-directed and they promoted primarily low-level thinking. For example, in the fall of the first year, a small group was reading "Goldilocks and the Three Bears." Ms. Gray asked questions about the story, such as, "What happened to the rocking chair? How did Mama feel when she saw the rocking chair? [A student answered "bad".] How would you describe the bear?" Students then continued reading. The teacher did not ask students to elaborate on their brief answers, and thus, the questions did not require the students to think about the text more elaborately or at a higher level. In the winter of Year 1, Ms. Gray and a group were reading a non-fiction story about penguins. Ms. Gray listed things the students told her they had learned about penguins. "What do penguins have? What do they eat?" At the end of the lesson, Ms. Gray asked students to review with her what they had learned that day. "We worked on finding the meaning of a word. We read the table of contents. We learned about reading non-fiction books."

During the spring of the second year, Ms. Gray's small group lessons looked very different. She included many more high level questions than she had the year before. As she worked with one group, the students interpreted characters in the story they were reading. Ms. Gray asked, "What does Mrs. Gorf think of kids?" A student replied, "She thinks they are a bother." After reviewing the plot, Ms. Gray then asked, "What do you think is the theme of the story?" After students took turns sharing about the importance of being nice to people, Ms. Gray asked, "How does the author's message affect your life?" Students talked about things that someone might say or do that could hurt other people. Ms. Gray had students summarize what they had learned that day. "We learned about theme. We learned that it's important to be nice to other people." Students then went to their seats to work on a story map for the story they had just read and discussed.

Discussion

Results of this study suggest that CIERA School Change Framework activities, stressing reflection on and change in teaching practices, were effective in increasing students' reading achievement in schools that implemented the reform reasonably well. As compared to the teachers in the low reform effort schools, teachers in the high reform effort schools appeared to be more attuned to the research on effective reading instruction they were provided with as participants in the project, and they used this information to

implement effective practices or to change their teaching to a greater degree than the teachers in the LRE schools. Most importantly, the success in implementing the reform effort within a school made a significant contribution to students' spring reading comprehension and fluency scores across a single year and in students' rate of growth in reading comprehension and fluency across two years.

It is encouraging to see that a group as complex as a school teaching staff was able to come together as a community to improve reading instruction by using data on teaching practices along with focused study group activities. It is also important to point out that change of this sort took root gradually, not suddenly. Growth in students' reading scores, as well as growth in classroom teaching practices, typically came in small increments from one year to the next. There were no quick fixes and no magic bullets to improving reading achievement in these schools—only hard work, persistence, and professional commitment.

The high reform effort schools typically had a supportive principal who was enthusiastic about the reform effort. In two schools, there was no district mandate to select a reform effort; these schools did so by their own volition. In the three other HRE schools, the CIERA model was selected by schools to help them succeed with the Reading Excellence funding they had received.

The HRE schools also typically had one strong and respected teacher leader who was persistent in helping teachers look at the data linking students' reading growth to classroom reading practices. Typically, this leader also steered teachers into study group topics that would make a difference, such as increasing higher level questioning or teaching comprehension as a strategy, not a skill. In most of the high reform effort schools, the teacher leader received support and assistance from a group of teachers who served as a teacher leadership team.

Unfortunately, about a third of the schools were not very successful in implementing the components of the CIERA School Change Framework. While disappointing, this finding is not surprising; a similar percentage was reported by Bryk, et al. (1998) in their study of school reform in Chicago. Although teachers in the LRE schools in the present study had voted to engage in the reform effort, they never really got it off the ground. As can be seen in Table 14, the low reform schools were not accomplishing most of the reform effort variables they had set out to implement. These schools generally lacked principal support, and no teacher leader emerged to keep the reform effort moving forward.

In one LRE school, the principal was new to the building, and the vote to engage in the reform had not been taken under his tenure. In another school, staff was told by their district that they had to pick a reform model

to improve school performance, and they selected the CIERA model reluctantly. In two schools, the CIERA model was selected by the staff from among a number of choices featured by the state to help schools succeed with their Reading Excellence Grant. In a fifth school, the principal was enthusiastic about engaging in the CIERA reform effort, but the teachers were not. However, another nearby school was participating which may have been a factor that encouraged this school to participate as well.

Limitations

This study was limited to 13 schools that were either in their first or second year of the reform effort. Although one may have expected the schools participating for 2 years to show more reading growth within a year than schools participating for only one year, this did not prove to be the case across all schools, irrespective of reform effort. The number of years in the project, entered as a school variable, did not contribute to variance among schools in growth in reading comprehension, fluency, or writing across a single year. Among schools that had been in the project for 2 years, we found that some second year schools, those that were implementing the reform relatively well, were more successful in terms of enhancing students' reading growth than other second year schools, as evidenced in the growth curve analyses.

A second limitation of this study of school improvement was its restriction to 2 years due to resource constraints. High reform effort schools were beginning to see positive changes in students' reading growth, but they had only started on a long journey. Effective school improvement is a complex, multi-year process (Fullan, 1999).

Data on teaching practices were limited to observations of 3 one-hour reading lessons per teacher. It would have been preferable to look at the entire literacy block on 3 occasions, or to increase the number of days of observation, but neither option was possible, again due to resource constraints.

Questions for Further Research

Because some schools in the project were not very successful in implementing the components of the CIERA School Change Framework, we ended our work vexed by the question of how schools can be helped when there is teacher buy-in but no real leadership from a principal and/or no substantial teacher leadership to keep a reading reform effort moving forward. Many of our nation's schools will not have the strong, democratic leadership (Bryk, et al., 1998) that is seen as necessary for a school to succeed in significant school reform. Giving up on these schools, however, is not an acceptable option. Perhaps district leaders should bear responsibility for seeing that effective school leadership is fostered within schools; or perhaps universi-

ties need to rethink their leadership preparation programs to ensure that the topic of leadership for curriculum and teaching is a prominent programmatic goal.

The successful schools in this project saw steady, but not dramatic, changes in their teaching practices and student achievement across 2 years. Clearly, even these improving schools needed more time to become successful. This raises another question in need of further research: How can a school be encouraged or motivated to stay in a reform effort over the long haul? So often, a school tries a new approach for 1 or 2 years and then moves on to something new. Again, it seems that district leadership may have a role to play in stabilizing both the leadership and the reform focus within schools.

Conclusions

The CIERA School Change Project provided structure and support for school improvement in reading within a school's building. Nevertheless, it was teachers' collaborative efforts, teachers' decisions about what to study, and teachers' perseverance that made the difference in the schools that worked so hard to implement the School Change Framework. This approach to school improvement will not work in all schools, especially if teacher buy-in and/or leadership is lacking, but the study does demonstrate that a framework for change which promotes "homegrown" reading improvement efforts can be used successfully by schools to positively impact their students' literacy abilities. When teachers collaborate, engage in ongoing, reflective professional development, and use data to improve teaching practice, they can see significant growth in their students' reading achievement. We close by noting the irony of providing evidence that homegrown models of reform can work at a time when some state and federal policies seem to be focused on dramatically limiting the choices schools have at their disposal in meeting legislative mandates to improve reading achievement.

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To read the full-text of this research, you can request a copy directly from the author. Request full-text. Download citation. This collection of essays aims to encourage high school students to improve their reading skills. The essays offer numerous practical teaching ideas for helping students increase their vocabulary and comprehension as well as learn to love the medium of books. Using authentic reading materials provides a situation in which students [Show full abstract] are responsible for their learning process and manipulate their prior and new information. First of all, such material should correspond with the needs of faculties' curricula. " To improve reading skills: According to some teachers, the best way to teach reading is to break the reading skills down into separate sub-skills by looking at what a good reader does when he goes about reading something, teach these separately and then put them all together. The other big group is skeptical and believes that there is no chance of putting all the sub-skills together and at the end they add up to the complete picture. In my opinion, if a student is able to use his reading sub-skills in the mother tongue, then the only problem is the English language. The first two objectives, developing reading skills and studying language, are really only tools for achieving this broader educational objective. Researchers at the HSE Institute of Education determined which of these changes are indeed important for improving the quality of Russian schools, and which merely point to quantitative changes. The OECD report, *Measuring Innovation in Education 2019: What Has Changed in the Classroom?*, was published in January 2019 and presented at a conference in Paris. Faculty members of the Centre for the Study of Innovation in Education at the Institute of Education of the HSE participated in the Russian component of the study. The report looked at how schools in 53 countries (including 47 OECD countries) Pre-reading activities get students ready to read a text. Taking time to prepare students before they read can have a considerable effect on their understanding of what they read and their enjoyment of the reading activity. Why pre-reading activities? Language learners need a reason to read. As students become more proficient at using reading strategies, you will be able to reduce the amount of guided pre-reading and allow students to do those activities themselves. In while-reading activities, students check their comprehension as they read. The purpose for reading determines the appropriate type and level of comprehension. While-reading activities are important whether done by students in the classroom or at home. Read about classroom tips and strategies for implementation. Break some students into reading groups to discuss the assignment. Allow students to read individually if preferred. Create quiet spaces where there are no distractions. Pros and cons of differentiated instruction. Research shows differentiated instruction is effective for high-ability students as well as students with mild to severe disabilities. When students are given more options on how they can learn material, they take on more responsibility for their own learning. Students appear to be more engaged in learning, and there are reportedly fewer discipline problems in classrooms where teachers provide differentiated lessons. Cons.