Professional Development that Supports the Teaching of Cognitive Reading Strategy Instruction

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Background

  While the field of research on teaching is still relatively young, there have been great strides made in what is known about the professional development of teachers (Borko, 2004, p. 3). First, there is little evidence that the typical "one shot" models of professional development have any lasting effects on gains made by students (Cochran-Smith & Lytle, 1999). Second, teachers report that they find these workshops boring and irrelevant, that they forget 90% of what was presented to them, and that they want more and better in-service support (Miller, 1998). Third, research has demonstrated that it is the quality of professional development that impacts teacher knowledge, beliefs, and practices (Anders, Hoffman, & Duffy, 2000; Duffy, 2004; Richardson, 1996). More specifically, studies have shown that the professional development of reading teachers is a long-term process that requires careful monitoring and intensive follow-up support (Duffy, 1993a, 1993b).

  States, districts, and schools have recently moved toward the coaching of reading teachers as a model of professional development (Dole, 2005). Literacy coaching has been shown to have a positive impact on the craft (Zwart, Wubbels, Bolhuis, & Bergen, 2008) and domain knowledge of teachers (Brady et al., 2009). Research reports indicate that literacy coaching has an impact on teacher efficacy (Cantrell & Hughes, 2008) and improved practices in the areas of special education (Gersten, Morvant, & Brengelman, 1995), writing instruction (Frey & Kelly, 2002), and preservice science teacher education (Scantlebury, Gallo-Fox, & Wassell, 2008). However, there is little empirical evidence that demonstrates coaching improves the practices of reading teachers with even less evidence in the area of comprehension instruction (Sailors, 2008). Furthermore, recent studies that have attempted to tie coaching to student reading achievement yielded mixed results (Lovette et al., 2008; Van Keer & Verhaeghe, 2005)

Purpose

  Based on our review of the extant literature, we sought to examine two models of professional development for classroom teachers: one based on a traditional 2-day workshop and a second that provided teachers with classroom-based coaching support in addition to a traditional workshop. Both models focused on improving the instructional reading practices of teachers as a way of teaching students to become more strategic in their reading. This exploratory study design and analytic approach allowed us to answer the following questions related to both teacher and student effects: (1) Does an intensive model of coaching lead to an increased use of intentional comprehension instruction on the part of teachers?; (2) Does the increased use of intentional comprehension instruction by teachers lead to increased reading achievement of students from low-income backgrounds?; and (3) Are there aspects of improvement in instructional comprehension practices positively associated with increased student achievement and which aspects can be attributed to the coaching model?

Setting and Participants

  The participants in this study were drawn from three school districts that served low-income communities located in metropolitan areas in central and southern Texas. Because schools are social places and teachers interact closely with each other during the school day, a phenomenon known as experimental treatment diffusion presented a threat to the internal validity of the investigation (Cook & Campbell, 1979). In order to avoid this phenomenon, we randomly assigned campuses to a group.

Teachers. Teachers for this study were drawn from 14 elementary schools and taught second (n = 6), third (n = 3), fourth (n = 6), fifth (n = 5), sixth (n = 3), seventh (n = 11), and eighth (n = 8) grade; there were no first grade teachers in this study. One of the teachers dropped out of the study in October, leaving us with 44 teachers. Many were regular education teachers who taught across the subject areas (37%), while others taught departmentalized reading (21%), social studies (20%), English/language arts (13%), and science (9%) classes. We did not include district designated special education or self-contained bilingual classrooms as part of this study, although many of the students in the study were learning English as a second language. Additionally, the years of experience of these participating teachers varied from a first year teacher to a 35-year veteran (mean of 9.9; SD of 7.53).

Students. We invited all students in the self-contained classrooms to participate; we randomly selected one class of the departmentalized teachers and invited students in that class to participate. Teachers collected parental consent forms on 543 students. During the course of the study, sixteen students dropped out, resulting in a final student-level sample of 527 students (N = 200 – full treatment/N = 327 – partial treatment). The average number of students we assessed in the treatment classrooms was 11.76 (SD = 3.53) and 12.11 (SD = 5.95), respectively. The participating students reflect the demographics of the larger school population.

Intervention

Content of professional development. Borrowing from other studies that have been successful in improving instructional reading practices, the research team taught participating teachers how to teach cognitive reading strategies (Dole et al., 2008, p. 348), specifically, how to engage in intentional comprehension instruction. Intentional comprehension instruction is the practice of (a) offering children opportunities to engage in cognitive reading strategies (Taylor, Pearson, Clark, & Walpole, 2000) and (b) explaining the subroutines, or secrets (Duffy, 2003), involved in those cognitive reading strategies in ways that are determined and constructed jointly by teachers and students (Anderson, 1992; Brown et al., 1996). Because reading comprehension is complex and comprehension instruction "cannot be routinized" (NICHD, 2000, p. 4-125), teachers must be metacognitively aware of their own use of strategies, able to explicate them, and able to modify and adapt their practices in order to make instructional decisions based on the needs of their students (Duffy, 1998; Hoffman & Duffy, 1999). So while teachers were provided with sample explanations throughout the professional development experience, they were encouraged to construct their own explanations with their students (Brown et al., 1996).

Delivery of the content: The interventions. The two intervention models (workshop only and workshop complimented by classroom-based support) began with the attendance of all teachers at a 2-day summer workshop. Teachers explored the cognitive reading strategy of inferencing deeply at this workshop. Although these workshops were held at the district headquarters and were devoid of students, they were based on structural and core features of effective professional development workshops for teachers (Garet, Porter, Desimone, Birman, & Yoon, 2001; National Center for Educational Statistics [NCES], 1999). The workshops were held prior to our first data collection time period. While all teachers attended the 2-day workshop, the teachers in the full intervention group also received classroom-based coaching support—each was assigned one of two instructional reading coaches; each coach supported approximately half of the teachers in this study. The coaches provided demonstration lessons in classrooms, co-taught with teachers, provided reflective feedback based on lessons they observed, and facilitated conversations that explored cognitive reading strategies. We collected

fidelity of implementation data that allowed us to feel confident that the coaches were implementing the intervention in similar ways.

Design

Using a random effects multilevel, pretest-posttest comparison group design and a multilevel modeling analytic strategy, we determined the effects of these two models. Schools were randomly assigned to treatment (workshop only or workshop plus coaching support) prior to the workshops.

Data Collection

Teacher data. We used the *Comprehension Instruction Observation Protocol System (CIOPS)* (Sailors, 2006) to measure the implementation of the content of the professional development. The CIOPS is a combination of observational note-taking and a quantitative coding process following the work of Herbert and Attridge (1975). The field notes captured contextual data including the materials used, text-based comprehension and/or comprehension strategy instruction, and the instructional strategies employed by the teachers. The observer transferred the narrative notes into the CIOPS system. Pre-implementation data were collected just after summer workshop during a two-week period (early September) and prior to the beginning of coaching. Post-implementation data were collected during a two-week period of data collection (late May) of the same academic year. All observers were blind to the condition of the teachers they observed. Although the observations were low inference, intensive training and monitoring in the use of the teacher observation data were necessary to obtain reliable results; point by point agreement using Cohen's Kappa statistic revealed an interrater reliability of .81. Throughout data collection, 10% of the lessons were checked for ongoing interrater reliability with results remaining above a Kappa of .80.

Student data. We used the *Group Reading Assessment and Diagnostic Evaluation (GRADE)* (AGS, 2001) to collect reading achievement data. Graduate student members of the research team administered the GRADE at the beginning (September) and end (May) of this study.

Coaching data. Each coach report included information on the date of the interaction, the amount of time spent with the teacher, the nature of the interaction, and the comprehension strategy that was the focus of the interaction. Additionally, the coaches submitted a brief set of notes that provided a narrative for the interaction.

Analyses

After data screening, we used a multilevel modeling analytic strategy that allowed us to examine the fixed and random variation in student change as measured by GSVs on the GRADE within and between full intervention and partial intervention classrooms (students nested within classrooms), and full and partial intervention classrooms nested within schools. The respective teacher's group and the classroom in which individual students were naturally nested or clustered constituted the fixed effects portion of our model within the hierarchical design. Student-level data on the GRADE were allowed to randomly vary across time using an autoregressive level-1 covariance structure allowing us to model the dependence among student-level scores nested within individual classrooms across time. In our analysis, we used the Hierarchical Linear Modeling computer program, version 6.0 (Raudenbush, Bryk, Cheong, Congdon, & DuToit, 2004). The method of restricted maximum likelihood (REML) was used for the estimation of all

parameters in the HLM model. We then examined the effect of treatment on teachers' use of intentional comprehension instruction expressed as the average or mean number of times teachers were observed to implement the instructional strategies. At pretest, the study groups were not observed to be statistically different on the average number of times they implemented the target instructional strategies. Therefore, we conducted a posttest analysis using an independent samples t-test using the average or mean number of times teachers were observed implementing the target instructional strategies as the outcome (dependent) variable. In some instances (e.g., when the independent and/or the dependent variables were on an ordinal or interval level) linear regression was the analytic method used due to the level of measurement of the data and the question posed.

Findings

We created two composite variables, both drawing from raw frequency counts of the CIOPS data (observed events as nominal yes/no for each of the strategies and interactional explanations). To capture the occurrence of cognitive reading strategies we summed all raw variables together except for the word identification/word recognition, fix-up, and test taking strategies and called this composite variable "opportunities to engage in comprehension strategies." The second composite variable allowed us to examine the constructed explanations around cognitive reading strategies. We called this composite variable "constructed explanations" based on the nature of its components. We based the linear composite variable on the frequencies of teachers either exhibiting these practices or not. Reliability analysis using non-parametric correlational statistics provided marginal adequacy ($\alpha = .79$) for the internal consistency structure of this composite variable.

For our first composite variable, opportunities to engage in cognitive reading strategies, we detected a statistically significant difference ($p < .05$), favoring the full intervention group. The magnitude of the effect size was large (Cohen's $d = .64$). We found similar patterns with our second composite variable, constructed explanations. There were statistically significant differences ($p < .05$) in the direction of the full intervention group for this composite variable. We observed a large effect for this analysis (Cohen's $d = .78$) according to Cohen (1988).

To answer the second research question, we used a multilevel, random effects pretest-posttest analysis of student-level scores on the GRADE. The fixed effects portion of our multilevel analysis revealed an average partial treatment group posttest score on the GRADE of $M = 437.19$ ($SD = 33.82$). At posttest, students in the full intervention group scored on average 11.27 points higher than students in the partial intervention group. Table 1 provides the means and standard deviations for students in each respective study group. Table 2 provides the results of the multilevel fixed and random effects analysis.

In the random effects portion of our multilevel analysis, we tested the magnitude and impact of the variability that occurred by allowing the intercepts and slopes to vary for students nested within teachers' classrooms (by full versus partial). Residual variance of the intercept in the random portion of the model was significant at $p < .001$, and random residual component of the slope variance for individual students over time was significant at $p < .05$. Results from the random portion of this model provided evidence that greater variability in reading achievement was explained by the analysis for students in the full intervention group. Importantly, we observed a statistically significant effect ($p < .001$) when allowing this random variability between groups. In this way, we identified important significant random variability between groups over time.

Because of the unbalanced structure of the numbers of students nested within grade level classrooms, we conducted a one-way analysis of variance (ANOVA) separately by full treatment and partial treatment groups to determine if any significant differences existed on GRADE scores across grade levels. We conducted the ANOVA $\underline{F}$-test at an alpha level of .05, corrected for type I error inflation using the Bonferonni correction, and we found no statistically significant results across the range of grade levels for either group.

The next sets of analyses (set to answer the third research question) explored the quantity of the interventions (measured by the number of minutes coaches spent engaged with the participating teachers) on the implementation of these practices by teachers in the study. We used linear regression to explore the opportunities with which teachers provided their students to engage in cognitive reading strategies and the role of the coaches' visits (as measured through time). Our results indicated that there were no statistically significant differences between groups. However, when we explored the use of constructed explanations and the role of the coaches' visits (as measured through time), we observed significant differences in the direction of the full intervention group ($\underline{F}$ = 7.74, $\underline{df}$ = 1, 25; $\underline{p}$ < .05). Based on a linear regression analysis, the results yielded an effect size of .24. The next sets of analysis explored the quality of the intervention, as described through the types of interactions that the coaches had with the participating teachers. Due to the nature of these data (i.e., counts of events), we used a chi-square analysis for this exploration. While there were no statistically significant results observed for the variables regarding the influence of each in explaining or predicting a teacher's engagement in constructed explanations, we observed very large practical effects for all of them (as measured through contingency coefficients): demonstration lessons ($\underline{CC}$) = .77; co-teaching ($\underline{CC}$) = .81; reflective feedback ($\underline{CC}$) = .82; guided conferences ($\underline{CC}$) = .84; teacher initiated interactions ($\underline{CC}$) = .87; and coach initiated interactions ($\underline{CC}$) = .82.

Conclusions

The results of this exploratory study suggest that classroom-based coaching might support teachers in the implementation of cognitive reading strategies across an academic school year. Our interest in understanding the value of coaching as part of professional development was noteworthy because of the lack of empirical evidence to support it (Sailors, 2008) and because of the pervasiveness of coaching in public schools (Dole, 2004). Our results indicated that while duration did make a difference in informing the instructional reading practices of teachers (both opportunities and constructed explanations), contact time with coaches made a difference only in helping teachers engage in constructed explanations to students. While we do believe that this study and its results have implications for research in reading and reading teacher education, it was exploratory and therefore does not imply a cause and effect relationship. Future research that attempts to fill in the still-remaining gaps will provide more answers to the complex questions associated with coaching, practices of teachers, and outcomes of students. Because billions of dollars are spent every year on the improvement of teaching and learning, ongoing explorations of coaching are important, regardless of cost and difficulty. The effects of coaching on teaching and learning warrant the attention of the research and policy communities.

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Tables

TABLE 1. Pretest and Posttest Mean Growth Value Scores and Standard Deviations as a Function of Study Group

Source	Pretest			Posttest			Effect Size (posttest- between groups)
	M	SD	n	M	SD	n	d
Full Intervention	436.50	39.61	179	448.46	34.95	179	
Partial							0.33
Intervention	433.40	39.20	265	437.19	33.82	265	

Note.—Effect size, Cohen's d, is calculated between treatment groups at posttest. Grand mean across all time points was 438.89.

TABLE 2. Multilevel Effects of Professional Development Model on Student Reading Achievement

Effect	Parameter	S.E.
Fixed effects:		
Intercept (average score - partial treatment group)	437.19***	2.31
Group (treatment)	11.27**	3.85
Time (average change in time slope)	-3.79*	1.66
Group X time (interaction of study group by time component)	-8.17**	2.69
Level-one (i.e., student-level) random effects:		
Intercept residual variance	521.14***	103.98
Student level (slope variance)	59.94	89.46

* Indicates a significant effect at p < .01.

**Indicates a significant effect at p < .01. At posttest, students in the treatment group scored an average of 11.27 points higher than students in the partial intervention group. Residual variance of the intercept in the random portion of the model was significant at p < .001; Random residual (i.e., slope/change) variance for individual students over time was not significant.

***Indicates a significant effect at p < .001.

Coaching in Literacy Collaborative and its Effects on Teachers and Students

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Background
National concern about students' literacy achievement, particularly for low-income and minority students, has led to efforts to improve classroom instruction in U.S. schools. To accomplish this goal, many districts (e.g., Chicago, Denver, New York City) and states (e.g., Florida, Pennsylvania) have invested in school-based literacy coaches to provide teachers with ongoing, site-based professional development and classroom coaching. However, in the years since Neufeld and Roper (2003) observed that "No one, as yet, has proven that coaching contributes significantly to increased student achievement … and how it influences teachers' practice and students' learning" (p.1), little additional empirical evidence has emerged to support the belief that school-based coaching is effective in improving either teacher practice or student achievement (Bean et al., 2008; Garet et al., 2008; Marsh et al., 2008).

As literacy coaching becomes increasingly prevalent, it is imperative that we establish not only whether coaching is an effective mechanism for school improvement, but also what characteristics of schools, teachers, and students mediate effects. This symposium presents results from a four-year longitudinal study of the effectiveness of a comprehensive school reform model, Literacy Collaborative (LC), which relies on long-term professional development by an onsite coach as its primary mechanism for change.

The study was guided by a conceptual framework incorporating individual and organizational influences on school change that draws from diverse literatures, including sociological research on teachers' work (Johnson, 1990; Lortie, 1975), theories of school organization (Bidwell, 1965; Louis, & Kruse, 1995; McLaughlin & Talbert, 2001), research on the diffusion of innovations (Frank, Zhao, & Borman, 2004; Rogers, 2003), and theories from cognitive psychology (Bandura, 1994; Eccles, 2002; Wigfield & Eccles, 2000).

Purpose
This study aimed to address outcomes and mediating factors that come into play as 17 schools implemented LC coaching. Using data collected on coaches, teachers, and children, it explored how variation in coaching affected improvement in student literacy learning.

Setting and Participants
The 17 participating schools were located in eight states in the eastern half of the US. Approximately 250 teachers and 8,520 children present in all kindergarten through second grade classrooms in these schools participated across the four years of the study.

Intervention
Used in over 700 elementary schools in 200 districts across 26 states, Literacy Collaborative (LC) is one of the largest literacy coach initiatives in the U.S. Its cornerstone is long-term professional development by an onsite coach. In LC, literacy coordinators (or coaches) are trained over the course of a year while still teaching in their schools. Their professional development promotes a thorough understanding of literacy theory and content, expertise in implementing the LC instructional model, and experience in supporting adult learners' development. After the training year, the literacy coaches teach classes of students half-time and assume full responsibility for providing a range of school-based professional development opportunities, including whole-school workshops, study groups, and one-on-one coaching.

Design
The study used a quasi-experimental, value-added approach to estimate effects on student learning. The first year of this four-year study represented a "no treatment" period and afforded data on student achievement for each school and classroom prior to program initiation. Implementation of LC professional development in kindergarten through second grade classrooms began in the second year and continued until the end of the study.

Data collection
Student literacy achievement data was collected every fall and spring in each participating school. Students took multiple subtests from the Dynamic Indicators of Basic Early Literacy Skills (McGraw-Hill, 2001) and the Terra Nova Multiple Assessments of Reading (Good & Kaminski, 2002), and item-level results were linked together into an interval, vertical scale using Rasch modeling (Wright & Master, 1982). The resultant vertical scale allowed us to exploit fully the longitudinal character of our student literacy learning data and resolve several difficulties with the use of DIBELS assessments in program effects studies.

Individual measures of teachers' "exposure" to coaching were derived from coaches' work logs, which included records of the number, length, and content focus of individuals' coaching sessions with their coach across the three years of implementation. In addition, as a routine part of implementation, coaches completed three observations each implementation year using model-based rubrics for each teacher in kindergarten to second grade. These rubrics captured both the frequency of implementation and the expertise demonstrated by teachers in using the LC framework. Finally, prior to program start-up, coaches and teachers in each school were surveyed regarding their 1) professional background, 2) previous literacy training, 3) prior teaching experience, 4) professional dispositions, and 5) school's organizational context.

Analysis
The current application of value-added modeling was rooted in the idea that each child has a latent growth trajectory, which can be represented as a linear function of time. The parameters in these trajectories, π_i, describe the expected achievement growth for child i absent the intervention and represent the achievement growth expected in grades K-2 for a child exposed to the average instructional conditions prevalent in the average school during the baseline period. Once an intervention begins, we estimate how the observed student growth trajectories differ from the expected (or latent) growth trajectories under baseline conditions. That is, we compare the observed outcome for each student i given exposure to a particular teacher j in school k in year t to the expected outcome given that student's latent growth trajectory. The value-added, v_{tjk}, is the difference between these observed and expected outcomes. In general, each teacher and school may have a unique value-added effect in each time period, but the analysis focused on explaining differences in the value-added effects in years two, three, and four of the study because they include potential effects associated with LC coaching. Predictors of value-added effects were explored, including teacher and school characteristics and the coaching delivered at teacher and schools levels.

Findings
Results demonstrated that LC implementation was associated with increasing improvements in student literacy learning rates over the three years of implementation (18, 29, and 38 percent in years 1, 2, and 3 respectively), and that these benefits persisted through subsequent summers. Moreover, these value-added effects converted into standard effect sizes of 0.24, 0.38, and 0.50 in years 1, 2, and 3 respectively. These value-added effects varied considerably among schools and teachers within schools, and that variability increased over time.

A coach's overall coaching activity (total one-on-one coaching sessions offered) does not appear to predict the value-added by schools. However, preliminary analyses of teachers' coaching participation revealed that receiving one-on-one coaching was a significant predictor of the value-added by teachers. Across models, coaching in the first year is negatively associated with higher value-added estimates, but by the third year coaching has a positive association (see Table 1).

Table 1. *Fixed Effects Value-added Coefficients (and standard errors) from Two Hierarchical Crossed-level Value-added Models, with and without Individual Teachers' Annual Coaching Participation as a Predictor.*

	Unconditional model	Coaching participation per year
Literacy Collaborative Implementation Year 1	0.18***	0.26***
Value-added	(0.04)	(0.04)
Teacher's coaching participation		-0.02***
		(0.01)
Literacy Collaborative Implementation Year 2	0.29***	0.30***
Value-added	(0.06)	(0.07)
Teacher's coaching participation		0.000^{ns}
		(0.005)
Literacy Collaborative Implementation Year 3	0.38***	0.25*
Value-added	(0.07)	(0.10)
Teacher's coaching participation		0.01*
		(0.01)

In addition to these effects on student literacy learning, previous analyses have identified important potential school- and teacher-level moderators of the effects of coaching. School size was highly predictive of the amount of coaching teachers within a school received. In addition, a teacher's individual sense of commitment to her school was predictive of both the coaching

teachers received and the effects of that coaching on frequency of and expertise in the coached practices. Ongoing analyses will explore the extent to which these factors may also moderate the effects of coaching on student outcomes.

Conclusions
Previous studies attempting to investigate the full causal cascade of coaching in a manner similar to the current study found literacy coaching had little (Marsh et al., 2008) or no (Garet et al., 2008) impact on student learning. The current study provides the first evidence that a literacy coaching model can indeed positively affect student outcomes; however, positive effects can only partially be attributed directly to coaching.

Given that value-added effects increased over time and especially that coaching positively predicted these effects only in the third year of implementation, coaching make take more than one year to effect change in student learning, which is consistent with prior research (Marsh et al., 2008). One potential explanation for this trend is that as LC implementation proceeded, coaches were likely gaining more experience entering teachers' classrooms and increasing their own expertise in introducing teachers to the instructional framework. It is also plausible that the initiative was becoming more firmly rooted in the schools' operations, facilitating more frequent and effective coaching. We also have evidence that the informal professional networks around literacy instruction in these schools grew stronger over time. These expanding social resources offer in turn still another possible account for these observed differences. In such situations, new teachers may benefit not only from the mentoring of a more experienced coach but also through the social learning that can occur as new teachers interact with more expert colleagues. Along a related line, the LC model involves more than just coaching and coaches do more than meet in one-on-one sessions with teachers. The fact that coaching does not fully explain variation in teachers' value-added over the three years of implementation suggests other factors are also at work. Future studies should delve deeper into questions of what types of coaching activities have the strongest impact on different types of teachers.

At the very least, the current study suggests that coaching does indeed have the potential to effect positive change in student learning. Alternative hypotheses for these results and research and policy implications will also be explored.

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Investigating the Implementation and Effect of the Content-Focused Coaching® Program on Instruction and Learning

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Background

Instructional coaching has been adopted by nearly every urban district in the country as a strategy for improving the achievement of poor, minority and English language learning students. The goal of instructional coaching is to create the types of embedded, practice-based learning opportunities for teachers that research suggests are most effective for improving the quality of instructional practice and student learning (see studies reviewed in Wei, Darling-Hammond, Andree, Richardson, Orphanos, 2009). Despite the widespread endorsement of coaching, however, evidence is mixed that coaching is an effective strategy for improving instruction and learning. Some research suggests that coaching supports teachers' ability to implement reform practices more effectively in their classroom (Joyce & Showers, 1996; Wei et al, 2009). Very limited evidence exists, however, that coaching increases student achievement (Gamse et al, 2008; Garet, et al; 2008; Marsh et al, 2008).

One explanation for why coaching has shown relatively small, if any, effects on student achievement is that the implementation of coaching policies and programs vary widely between schools (Duessen, Coskie, Robinson, & Autio, 2007). To understand why this is the case, researchers have investigated the relationship between various contextual factors in schools and districts and teachers' coaching experiences. These contextual factors include policies for determining who is qualified to serve as a coach (Allington, 2006; Roller, 2006), definition of the coaching job (Duessen, Coskie, Robinson, & Autio, 2007), school-level norms for teachers' professional community (Stoelinga, 2008), teachers' experience level (Smith & Desimone, 2003); and principal leadership (Mangin, 2007; 2008). Few studies, however, have directly linked pre-existing contextual factors in schools to variable implementation of coaching programs, or have investigated the relative contribution of these factors to teachers' coaching experiences.

Purpose

Our project implements and studies the effect of a literacy-coaching program (Content-Focused Coaching®, CFC). In this presentation we present findings pertaining to 1) the influence of a school's social resources on the implementation of the CFC program; and 2) the effect of the CFC program on teachers' coaching experiences, reading comprehension instruction and student achievement. Issues pertaining to implementing and studying instructional coaching programs in urban settings with high teacher mobility also are discussed. The specific research questions we address are as follow:

1. How do a school's social resources, including principal leadership, norms of the professional community in a school, and teacher and coach characteristics, influence the school-level implementation of the CFC program?

2. What is the effect of the CFC program on teachers' coaching experiences (the frequency of their participation, the content emphasized in coaching activities, and teachers' perception of the usefulness of coaching for improving their practice)?

3. What is the effect of the CFC program on teachers' reading comprehension instruction (observed classroom text discussions)? And,

4. What is the effect of the CFC program on students' reading achievement (for all students, and for English language-learning students in specific)?

Setting and Participants

The study was conducted in an urban school district in Texas serving large numbers of Hispanic and English language learning students from low-income families. The schools in our study (*N*=29) were sampled from the 32 lowest-achieving schools in the district.

Teachers. Only 98 of the 177 teachers participating in the first year of the study (55%) remained at their school or grade for the second year of the study (CFC *n*=60 61%; Comparison *n*=38 39%). No difference between the treatment and comparison schools was detected for the level of teacher attrition. Of the 98 teachers who remained, 58% teach fourth grade and 42% teach fifth grade. Over a third of the teachers (38%) have a Master's degree. A small number of teachers (4%) hold National Board for Professional Teaching Standards certification. Sixty-percent of the teachers teach a designated ELL class. As a group, teachers have a wide range of teaching experience, ranging from 0 to 32 years and averaging about 10 years teaching generally and 9 years teaching reading. English is the language of instruction for about half of the teachers (53%). The remaining teachers teach lessons in both English and Spanish. The teachers in the comparison and intervention schools do not differ on any demographic characteristics. Comparisons between the 98 two-year longitudinal teachers and teachers who left their grade or school at Year 2 indicated no differences in education, teaching experience, or certification backgrounds. Only one difference (*p*<.05) emerged in the language of instruction in the Year 1 classes: 73% of teachers who left their school or grade taught their classes in English only compared to 53% of the longitudinal teachers.

Students. Nearly all of the students in the study schools (*N*=1714) are eligible for free or reduced-price lunch (91%). The large majority of students (80%) are Hispanic. The remaining students are African American (15%), white (3%) and Asian (2%). Forty-percent of the students are classified as English language-learners (*n*=741), and 2% are immigrants from a non-English-speaking country. Differences in the student population between the treatment and comparison schools were included as covariates in the analyses.

Intervention

Content-Focused Coaching (CFC) is an intensive professional development program that aims to ameliorate the problems of implementing effective coaching in schools by first building coaches' content knowledge base and skills, and, second, helping create the organizational conditions in schools and districts that are posited to support effective coaching (Staub & Bickel, 2003; Staub, West, & Bickel, 2003).

For the purpose of this study, school district leaders and fellows from the University of Pittsburgh's Institute for Learning (IFL) collaborated to hire the CFC coaches. CFC coaches

engaged in three days of professional development per month over the course of three academic years. The professional development, led by the IFL fellows, is designed to increase coaches' knowledge of the theory and research underlying effective reading comprehension, vocabulary, and writing instruction (Beck, McKeown, & Kucan, 2002; Block & Pressley, 2002), with a special emphasis on the role of classroom talk and vocabulary instruction in supporting students' understanding of texts. The program also focuses on building coaches' pedagogical skills so that they can model exemplary reading comprehension lessons in teachers' classrooms, and coaches' 'coaching' skills so that they can work effectively with teachers.

CFC-trained coaches are expected by the program developers meet with teachers individually on a monthly basis and in weekly grade-level team meetings to study the theory underlying effective instruction and to plan rigorous reading comprehension lessons. CFC coaches also are expected to model lessons, co-teach, observe reading comprehension lessons in teachers' classrooms on a regular basis, and reflect on the effectiveness of these lessons (e.g., what students seemed to understand, what they seemed to have difficulty comprehending, etc.) with teachers in post-lesson conferences. Improved quality of reading comprehension instruction is posited to lead to improved student achievement.

Design

Schools were randomly assigned to treatment (to participate in the CFC program) or comparison conditions (to continue with the professional development resources that are standard for the district). Prior to the beginning of the CFC intervention, one treatment and two comparison schools left the study, resulting in 29 schools total (15 treatment and 14 comparison).

Data Collection

Teachers completed surveys at baseline and at the end of each study year focused on their school's social resources (i.e., principal leadership and norms for teachers' professional collaboration), participation in literacy coaching, and instructional practice. Teachers also were observed teaching a reading comprehension lesson twice during each study year (in fall and spring). Student achievement was assessed on the Degrees of Reading Power (DRP) assessment and the state achievement test (Texas Assessment of Knowledge and Skills, TAKS).

Analyses

Regression analyses were used to estimate the relative effects of the features of a school's social resources (principal leadership, norms for teachers' professional collaboration, teacher and coach characteristics) on teachers' participation in coaching at the end of the program's first year. Repeated measures analyses of variance were used to identify and compare patterns of change in teachers' participation in coaching activities, the content emphasized in coaching activities, and teachers' perceptions of the usefulness of coaching for improving their practice. Frequencies also were computed to describe variation in teachers' participation in specific coaching activities. Repeated measures analyses of variance techniques were used to investigate patterns of change

over time in teachers' self-reported and observed instruction. HLM analyses were conducted to estimate the relative effect of the CFC program on student achievement.

Findings

As hoped for by the developers of the CFC program, teachers in the schools participating in the CFC program increased their participation in literacy coaching at the end of the first year beyond that of teachers in the comparison schools. This was the case even though the CFC program was not fully implemented at the intended level. Commensurate with the goals of the CFC program, teachers in the CFC schools reported that the coaching they received placed significantly greater focus on planning and enacting instruction, increasing their knowledge base, and establishing learning communities. These findings are important as they highlight success in gaining access to teachers' classrooms, a difficult task for many coaches to accomplish (Bean, 2004).

Our results also provide evidence that a school's social resources predicted the amount and type of coaching and perceived usefulness of coaching received by teachers. Chief among these factors was principal leadership. Principals played a critical role in facilitating more successful implementation of the CFC program. Specifically, principals' willingness to share leadership positively predicted the frequency of teachers' participation in coaching and perception that the coaching they received was useful for improving their practice. Principals' willingness to share leadership also was predicted teachers' participation in coaching that emphasized planning and reflecting on instruction and lesson enactment.

The experience level of coaches and teachers predicted teachers' participation in coaching. Experienced coaches were more likely to engage teachers in activities that emphasized lesson enactment and creating learning communities. Less experienced teachers participated more frequently in coaching overall, and in coaching activities that emphasized planning and reflecting on instruction.

Unexpectedly, we found that an established culture of teacher collaboration in a school was a negative predictor of teachers' perception that the coaching they received was useful for improving their practice, and the extent to which teachers' participated in coaching that emphasized planning and reflecting on instruction and enacting instruction. A trend in our data also suggests teachers participated less frequently in coaching in schools that had a strong established culture of teacher collaboration (p=.064). We expected that coaches would have an easier time establishing themselves in schools where teachers were already collaborating on a regular basis to plan lessons and discuss instruction because coaches would be able to build on these established routines in their work with teachers. Instead, our findings indicate that coaches faced a more difficult challenge gaining a foothold with teachers in these schools and becoming part of their existing collaborative efforts, and an easier time engaging teachers in schools that had a fewer pre-existing opportunities for teachers' collaboration.

With regard to the effectiveness of the CFC program, results from the end of the second year of the program indicate that teachers in the CFC schools showed modest improvement in the quality of their observed and self-reported reading comprehension instruction. No difference between groups was detected for students' scores on the TAKS and DRP assessment. Separate analyses

focused on outcomes for the ELL students only, however, showed that ELL students (n=741) in the CFC schools attained significantly higher scores on the TAKS (see Table 1).

One explanation for why the CFC program showed an effect on ELL students only is that this program may be most effective for the lowest-achieving students (as is the case with the ELL students in our sample). An additional explanation could also be that ELL student outcomes may be especially sensitive to variation in the quality of classroom discussions – the instructional focus of the CFC intervention. To better understand why the ELL students showed improvement on the TAKS we conducted further analyses focused on examining the specific features of instruction associated with increased TAKS scores for this population. These results indicated that increased student participation in classroom discussions, students giving evidence for their assertions in class discussions, and students connecting their comments to statements made by other students were associated with higher TAKS scores. These results are commensurate with other research suggesting that increased opportunities for productive language use in class discussions may be especially beneficial for ELL students (Goldenberg, 2008).

Conclusions

Our findings provide evidence that structured coaching programs that include substantive opportunities for coaches' ongoing learning can improve reading comprehension instruction and student achievement – for very low-achieving students at least. Our results also provide evidence that principal leadership, and other dimensions of a school's social environment, play a critical role in the implementation of coaching. This suggests that coaching programs and policies generally might be more effectively implemented if they include a focus on engaging principals as partners in their coach's work with teachers. Our results also raise the possibility that coaching may be especially effective in schools that have large numbers of novice teachers as these teachers were more likely to participate in coaching and to believe that the coaching they received helped them improve their practice.

Table 1

HLM Results from the final teacher-level student reading achievement (TAKS) model

Final fixed effects	Coefficient	*se*	*T-ratio*	*p-value*
Intercept	2154.41	6.83	315.55	.000
Observed quality of reading comprehension instruction				
Student participation in class discussion about a text	52.03	16.62	3.13	.003
Teacher's linking contribution	3.63	13.99	.26	.796
Student's linking contribution	0.59	11.20	.05	.959
Teacher asks students to support their contributions	-4.30	7.53	-.57	.570
Students provide support for their contributions	23.97	11.31	2.12	.039
Academic rigor of the text	32.82	17.74	1.85	.070
Academic rigor of the discussion about a text	-21.40	19.60	-1.09	.281
Observed test preparation	73.42	27.30	2.69	.010

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