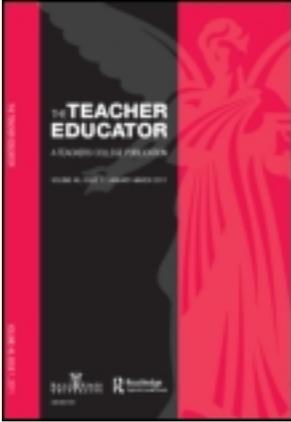


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RESEARCH ARTICLE

COACHING MIDDLE-LEVEL TEACHERS TO THINK ALoud IMPROVES COMPREHENSION INSTRUCTION AND STUDENT READING ACHIEVEMENT

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In an effort to improve student achievement, a group of middle-school teachers at an underperforming school developed a schoolwide literacy plan. As part of the plan, they agreed to model their thinking while reading aloud. Eight teachers were selected for coaching related to think alouds in which they exposed students to comprehension strategies that they used while reading. The achievement of their students was compared with the achievement of students whose teachers participated in the ongoing professional development but who were not coached. Results indicate that the coached teachers changed their instructional practices and that student achievement improved as a result.

Comprehension occurs when a reader constructs meaning by interacting with a text (Davis, 1944, 1968; Anderson & Pearson, 1984; Pressley & Hilden, 2006). The success of this construction of meaning process is dependent on the reader's prior knowledge of the topic, the structure of the text, the context, and the process of reading (Lipson & Wixson, 1986). Successful readers know how to support their comprehension before, during, and after reading because they have a plan to help them solve problems they encounter that could interfere with their understanding (Dewitz, Jones, & Leahy, 2009; Paris, Wasik, & Turner, 1991). This does not happen hierarchically since one idea often branches to another as proficient readers continually connect information through

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ever expanding schemas. Anderson, Reynolds, Schallert, and Goetz (1977) demonstrated that a reader comprehends or understands what they are reading only when the content relates to information they already have. The veracity of this information base is so important since erroneous or insufficient information can negatively impact the construction of new meaning (Driver & Erickson, 1983; Fisher & Frey, 2009; Lipson, 1982).

Teacher-directed think alouds is one strategy often recommended for improving students' knowledge about reading and reading strategies. Instructional implementation of teacher modeling involves a proficient reader (teacher) thinking aloud in a conversational manner of a content area text, in a way that illustrates and scaffolds for students how to build the new knowledge and language about a topic and about the features and structure of the text in which the information is contained. When modeling this interactive process, teachers can also demonstrate how to move to less difficult related texts when they have insufficient knowledge to read the assigned text, make obvious how to figure out unknown vocabulary through context, morphology, or glossary and dictionary surveying, and explain how they use electronic sources (texts, Web sites, united streaming, Google, podcasts) to help them find sources of information that support growing their information base.

Understanding this, we hypothesize that the students and teachers at Wolf Creek (pseudonym) Middle School, which had not met their yearly progress goals as outlined in U.S. federal regulations and had been identified as "In Need Of Improvement," might make progress through the implementation of teacher think alouds as part of their schoolwide literacy efforts. We asked them, "Have you ever wondered if your students' reading performance could be positively influenced by your modeling of how you, as a proficient reader, applies needed cognitive strategies in order to make sense while you are reading a text? Does this type of thinking out loud, which makes public what a proficient reader does unconsciously, make a difference in how students eventually self-monitor their understanding of text?" These were the major questions we considered as we worked with a group of dedicated teachers as they attempted to improve student achievement.

As we observed student performance, analyzed student test scores, and talked with the teachers from the school, it became obvious to us that a large percentage of students who were reading well below their grade levels performed very similarly to the less able readers studied by others (Cain & Oakhill, 2004; Garner & Reis, 1981; Owings, Petersen, Bransford, Morris, & Stein, 1980; Yuill & Oakhill, 1991).

These researchers noted that struggling readers of various ages lacked proficiency with:

- varying reading style when materials are difficult.
- retracing text being read for answers to unknown questions.
- varying strategies when having difficulty comprehending text.
- verifying text interpretations or predictions.
- empathizing with text messages.
- understanding how the reading process works.
- monitoring their comprehension of text.

As we observed and conversed with these teachers we noted that many of them did not have an explicit plan of instruction designed to expand the literacy or content learning of their students. Unlike the teachers in the study conducted by Roehrig, Turner, Grove, Schneider, and Liu (2009), the teachers at this school were not aligned in terms of instruction. Their students, like many other economically poor children throughout the country, had not grown up in homes that provided the outside-of-school early communication interactions (Bernstein, 1965) that are informally developed through socially shared family literacy practices such as storybook reading and talking about text conventions and meaning (Frijters, Barron, & Brunello, 2000; Whitehurst & Lonigan, 1998, 2001). When children come to school having developed this outside-of-school literacy base, they are better prepared for the inside-of-school literacy experiences that are built or scaffolded from this foundation of experience (Gee, 2001; Heath, 1993; Paratore, Melzi, & Krol-Sinclair, 1999). As Rupley, Nichols, and Blair (2008) reminded us, understanding of texts is based on both language and culture. The teachers in this school needed to ensure that their students developed and activated knowledge of both language and culture.

Realizing that as readers become experienced at reading a certain text style they gain additional insights about how to read that particular text genre (Stromso, Bråten, & Samuelstuen, 2003), we wondered if by having middle-school teachers think out loud about their personal reading plan, as a model of what a proficient reader does when a text is appropriate as well as too difficult, we would be able to provide students with an example that could be personalized by them to support their path to successful textbook reading. We also wondered if this modeling might prove an effective way to inservice the teachers of these students about effective content area literacy strategies. Noting the previous findings of research on thinking aloud that was compiled by Pressley and Afflebach (1995), we thought the link for these middle-school students to proficient reading might be this type of modeling.

Methodology

Participants

Wolf Creek Middle School is a school of more than 1,400 students, over 80% of who qualify for free lunch and 40% of who are homeless. The majority (65%) of students speak another language or a non-standard form of English at home. The 96-member faculty at Wolf Creek engaged in a schoolwide literacy planning process in which the teachers identified a number of content literacy strategies that all teachers would use. The teachers at Wolf Creek were motivated to develop a schoolwide literacy plan because the majority of their students read significantly below grade level and the school was in program improvement as a result. The faculty identified a number of strategies that teachers could use to facilitate students' literacy learning, including think alouds, writing to learn, shared readings, independent reading, vocabulary instruction, and Cornell note-taking.

As part of their plan, the teachers participated in numerous professional development sessions focused on the components of their locally developed literacy plan. The professional development plan incorporated some "best practices" in professional development, including sessions that were based on needs-assessments, were job-embedded during the school day, allowed for extensive discussion of teaching practices based on videos of classrooms from the school, and were delivered by teachers in the school (e.g., Joyce & Showers, 2002). Given that the sessions were job-embedded, all teachers were required to participate.

To assess the impact of coaching on teacher implementation and subsequent student achievement, we randomly selected eight teachers for weekly coaching and feedback. Of these eight teachers, two taught English and were female, one taught science and was male, two taught social studies and were male, one taught math (pre-algebra) and was female, and two taught electives (art and health education) and both were female. Their experiences ranged from 2 years teaching to 16 years teaching and they had all taught at other schools in their past.

We also randomly selected eight teachers for a control group after excluding all of the teachers who had students in common with the eight randomly selected intervention teachers. Of these eight teachers, one taught English and was female, one taught science and was female, three taught social studies and two were male and one was female, and three taught electives (foods, art, and health) and two were female and one was male. Their experiences ranged from 1 year teaching to 19 years teaching and they had all taught at other schools in their past.

Both groups participated equally in the professional development sessions, but the intervention group had weekly discussions based on their implementation in the classroom. The eight intervention teachers taught a total of 446 students. These students were not enrolled in any classes with the eight teachers who served as the control group. The number of students in the control group was 482.

Instruments and Procedures

Every student was given the Gates-MacGinitie reading assessment, fourth edition, during the first few weeks of the school year. We used the comprehension subscale of the Gates-MacGinitie assessment to determine if student achievement changed and not the vocabulary subscale or total score as we hypothesized that vocabulary scores might be susceptible to other components of the school literacy plan. We reported the scores as grade-level equivalents provided by Gates-MacGinitie.

Each week, the eight intervention teachers were observed by a peer coach as they engaged in a shared reading and think aloud using the form in the Appendix. Following the observation, the coach engaged in a discussion with the teacher about the lesson. In addition to the observation forms collected by the peer coaches, the researchers conducted 16 “ride alongs” (two per teacher over the course of a semester) in which one of us participated in the observation and coaching session. Field notes from these ride alongs were collected and transcribed.

Data Analysis

In addition to measures of central tendency, we used analysis of variance (ANOVA) to determine if the impact teachers had on comprehension was significant. We also analyzed the observation forms and field notes to determine the types of coaching provided to teachers. Finally, we conducted a member check consisting of three teachers who reviewed the findings and provided commentary on the discussion and recommendations contained within this article.

Findings

The two groups, intervention and control, did not differ significantly on the September administration of the Gates-MacGinitie reading assessment (see Table 1). The intervention group average on the comprehension subscale was 4.4 and the control group average was 4.3, indicating that students in both groups, on average, read just above the fourth-

TABLE 1 Group Comparisons on the Gates-MacGinitie Reading Assessment

	<i>M (SD)</i>	<i>F</i>	<i>p</i>
Pretest			
Intervention group	4.4 (1.07)		
Control group	4.3 (1.13)	1.91	.167
Posttest			
Intervention group	5.3 (.93)		
Control group	4.7 (1.41)	84.16	.001

grade reading level despite being in sixth, seventh, and eighth grades. However, by the posttest, the average for the students whose teachers were in the intervention group had increased to 5.3 whereas the control had only increased to 4.7. As noted in Table 1, these results were statistically significant and the effect size for the intervention was .435.

These data suggest that teacher conducted shared readings with think alouds can improve students' comprehension. When students are provided with a model of comprehension, they appear to perform better on comprehension tasks. An analysis of the coaching plans and classroom observations reveals a number of interesting trends.

First, the data suggest that teachers do not regularly model their own thinking and that the coaching system helped them integrate this procedure into their classrooms. During the first coaching session focused on shared reading, none of the eight intervention classroom teachers modeled their thinking. Instead, they all asked students comprehension questions. This is reminiscent of Durkin's (1978) findings that teachers used questioning rather than comprehension instruction. For example, in a science classroom the teacher read aloud from the textbook. The selection was a primary source document focused on sea life. As she read, the teacher regularly stopped to ask student comprehension questions, such as "What do you think might happen if too much garbage gets dumped in the sea?" At another point during the reading, the teacher paused and asked, "Who remembers what Crustaceans means?"

Second, coaching interactions are based on trust relationships. Time and time again, we read about and observed the intimate interactions between the coaches and the teachers being coached. The teachers wanted the feedback and looked forward to the discussions. They understood that everyone was learning and trying to improve instructional routines for students. They also knew that the coach would not violate the trust and tell others, including the administrator. In-

terestingly, this applied to both positive and negative feedback. As an example, an English teacher reminded the coach not to talk with the administrators about the progress she made in sharing her thinking. As they were ending the discussion, the teacher said, “Yeah, I’m feeling pretty good about this. I think I’m getting it and my students really are benefiting. But remember not to talk with Mrs. X. I don’t want her holding me up in front of the other teachers or anything. I’m just doing this for my students.”

Third, as evidenced in our observations of the coaching sessions and in the notes from the coaches, students incorporated the language used by their teachers into their conversations with peers. For example, during a social studies observation, the teacher modeled his understanding of the text using connections. During a shared reading aligned with the content standard (identify reasons why people choose to settle in different places), the teacher made a number of connections related to family, natural resources, and job opportunities. At one point, he said,

I have another text to self connection. This text reminds me about the time when my brother moved because of a job. The job paid really, really well. But his family didn’t want to go. They had a family meeting to talk about it all. The family ended up deciding to settle in a new place because of the opportunities there. Yeah, do you see the connection?

Students then began talking with peers about the connections they made. One of them discussed the book she was reading and how the family was forced to move. Another student talked about moving because of the climate. As he said, “I was thinking about this in my own life. We moved here because it’s warm and my grandma needed a warm place because of her sickness.”

Fourth, some of the comprehension skills were more difficult to develop than others. Most significantly, summarizing and synthesizing were the least often modeled for students, even at the end of the study. The coaches regularly talked with teachers about all of the comprehension strategies, and even encouraged teachers to focus on summarizing and synthesizing. For some reason, teachers rarely incorporated this habit into their shared readings and think alouds. Although we can hypothesize the reasons for this, one of the comments overheard during a coaching session shed some light on the subject. An English teacher said, “I don’t want to do all the work for them, they need to do something.” Although interesting, this is somewhat troubling given the fact that students incorporated teachers’ behaviors into their practices. It seems reasonable to suggest that students would be better summarizers if their teachers modeled this for them.

And finally, there are clear effects of quality instruction on student learning. As these teachers participated in the interactive professional development sessions it became obvious from their comments that they began to view reading as an active, engaged process that if modeled for their students could result in student ownership and subsequent increases in their comprehension and language growth and independence. They became more attuned to observing the performance of their students and modeling instruction that scaffolded learning.

One seventh-grade social studies teacher illustrated this understanding when she said,

I really learned about how often I use these comprehension and vocabulary strategies as I thought out loud about them when I was reading a piece about the ways in which archaeologists and historians make sense of the medieval past. Wow, I never knew my mind was so busy making sense of all of these squiggles on the page. I really was predicting, imagining, figuring out words, making connections, rereading, reviewing and summarizing as I read. I was also surprised at how I slowed down when I didn't get it. It was trippy to watch myself read. I stopped asking so many questions and started talking more with the kids about the information and my reading and thinking processes. As we talked I understand better what my kids didn't understand. Then I modeled it and discussed it. I stopped asking them questions they couldn't answer. We were talking about something that really mattered.

Another teacher agreed, stating:

Yes my thinking aloud in front of my students seemed to make them more relaxed as they read. I realized this after they saw me construct or build the meaning as I read scientific diagrams that detailed the features of the water cycle (i.e., evaporation, condensation, precipitation, run-off, transpiration). This helped them to question what they didn't understand. We all learned a lot about how to tear apart a science text.

A comment by another teacher supported the importance of a gradual release of responsibility model (Duke & Pearson, 2004), which in this case provided the students with the internalized understanding of how to comprehend across texts. "Since so many of us are doing this, I'm starting to see my students do it naturally. They can figure out why they aren't getting it even when they are reading something I haven't modeled." Although like many teachers, this mental modeling did not come easy to them (Pressley & El-Dinary, 1997), their comments support their realization that their modeling of comprehension strategy instruction resulted in a change in the performance of their students

who were observed by them to be learning how to take ownership for their own reading and thinking through a text.

Discussion

The data from this study clearly indicate that teacher modeling of thinking results in increased student achievement and teacher awareness. Similar to the work of Phillips (1988) and Duffy (2003), the data from this study demonstrate the powerful impact of modeling for students how to use reading skills and strategies to think through a text. Said another way, understanding what students are not doing and providing them with models for engaging in effective reading practices increases their comprehension and raises their achievement. As Block and Israel (2004) noted in their rationale for thinking aloud, metacognitive awareness, the type of thinking developed as teachers think aloud, “significantly increases students’ scores on comprehension tests, adds to students’ self-assessment of their comprehension, and enhances students’ abilities to select thinking processes to overcome comprehension challenges while they read” (p. 154).

Beyond the recognition of the impact that teacher modeling through think alouds has on student achievement, this study adds to the growing literature base about peer coaching as an effective teacher development tool. As teacher educators, we can foster changes in teacher practices that impact student learning. Although the control teachers did not change their practices, the intervention teachers did. The professional development in which they were involved illustrated a model of collaborative problem solving. The teachers at Wolf Creek Middle School had identified a problem and had requested professional development that would provide them with, as Guskey (2000) suggested, a better understanding of “processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students” (p. 16).

Together with the researchers, a plan, which was sensitive to collaboratively designing professional experiences that addressed shared content, context, and process issues (National Staff Development Council, 2001), was implemented and continuously evaluated. Jointly the teachers and researchers worked to identify the *content* that would expand the informational and instructional knowledge bases of the teachers and the subsequent performance of their students (Darling-Hammond 1997, 1998, 2000). The need for newly identified content came as a result of a situational *context* described by the teachers and administrators “as in need of change if they were going to meet their NCLB performance goals.” The *process* related characteristics (Bean, 2009) used

for conducting and continuously evaluating the effect of the professional development in this study included duration, supportive feedback that was embedded within classroom practice, and strong support and recognition of the teachers for their initiation of this project, their contributions to shape it, and their willingness to grow and transform their instructional delivery model.

Given the significant investments in professional development throughout the country, especially focused on adolescent school literacy, we need to ensure that changes in practice are sensitive to these factors. To this end this study substantiates the belief that peer coaching facilitates the implementation of high-quality professional development (e.g., Joyce & Showers, 2002) that results in improved student performance. As Eun (2008) noted, professional development plans, like the one implemented at Wolf Creek, can be designed and implemented based on Vygotsky's theories. In these cases, teachers seem more likely to commit to the new instructional routines rather than comply with directives from others.

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APPENDIX: THINK-ALoud RECORD OF NARRATIVE OR INFORMATIONAL TEXT

Teacher Is Modeling How To:

1. **Figure out** ...
 - ___ what the text or problem is about
 - ___ an unfamiliar word

Example of what teacher says:

(Teacher shows how to figure out unknown word or how to skim text or problem.)

- *When I look at this title, I think this is probably _____ because _____*
- *I'm not sure how to say this word or what it really means.*
- *When a word is confusing or I don't know it, I ...*
- *The words around it make me think it might mean ...*

2. **Make or Revise Predictions** ...

- ___ about the text, problem or story topic based on title, facts and illustrations
- ___ about the characters, events, nonfiction facts
- ___ about what is about to happen

Example of what teacher says: (Teacher makes predictions that will be checked later.)

- *I always skim the layout of the text or problem to get an idea about what I'll be reading.*
- *The title makes me think this is going to be about ...*
- *At first I thought _____ but now I think _____*

3. **Make Connections** ...

- ___ to other texts or problems
- ___ to prior experiences
- ___ to portions of the same text

Example of what teacher says: (Teacher will connect to a previously read text or experience.)

- *Reading this text makes me think ...*
- *Reading this text reminds me of ...*

4. **Ask Questions** ...

- ___ about the characters, events, or facts
- ___ about the information that wasn't presented

Example of what teacher says: (Teacher questions character's actions or personality, what is being discussed in text or story, or the presentation of the information, graphics, pictures, problem.)

- *I wonder why ...*

5. **Summarize or Synthesize** ...

- ___ about the story or character
- ___ about the information

Example of what teacher says: (Teacher summarizes the story or text. Refers back to the title or earlier made predictions about the title or features.)

- *Oh, so this is what this was about ...*

Teacher _____ Observer _____ Date _____
 Subject _____ Period _____

Students are ... ___ following along in the text as the teacher reads ___ taking notes ___ conversing with teacher/peers ___ off task
