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## EXECUTIVE SUMMARY

### The Challenge

Although some progress has been made in improving the literacy achievement of students in American schools during the last twenty years (Lee, Grigg, and Donahue, 2007; Salah-Din, Persky, and Miller, 2008), the majority of students still do not read or write well enough to meet grade-level demands. Poor literacy skills play a role in why many of these students do not complete high school. Among those who do graduate, many will not be ready for college or a career where reading and writing are required. These young people will find themselves at a serious disadvantage in successfully pursuing some form of higher education, securing a job that pays a living wage, or participating in social and civic activities.

The financial and social costs of poor literacy have been well documented (Greene, 2000). The consequences of poor reading and writing skills not only threaten the well-being of individual Americans, but the country as a whole. Globalization and technological advances have changed the nature of the workplace. Reading and writing are now essential skills in most white- and blue-collar jobs. Ensuring that adolescents become skilled readers and writers is not merely an option for America, it is an absolute necessity.

### The Approach

During this decade there have been numerous efforts to identify instructional practices that improve adolescents' literacy skills, such as *Reading Next* (Biancarosa and Snow, 2004), which drew a set of fifteen instructional recommendations for an effective adolescent literacy program based on the professional knowledge and research of nationally known and respected literacy researchers. Such efforts also include systematic reviews of high-quality research to identify effective instructional practices for improving the comprehension of struggling adolescent readers (Scammacca et al., 2007), as well as similar analyses to identify effective practices for improving adolescent students' writing (Graham and Perin, 2007a; Rogers and Graham, 2008).

Despite these efforts, educators and policymakers need additional evidence-based practices for improving the literacy skills of students in American schools.

One often-overlooked tool for improving students' reading, as well as their learning from text, is writing. Writing has the theoretical potential for enhancing reading in three ways. First, reading and writing are both functional activities that can be combined to accomplish specific goals, such as learning new ideas presented in a text (Fitzgerald and Shanahan, 2000). For instance, writing about information in a science text should facilitate comprehension and learning, as it provides the reader with a means for recording, connecting, analyzing, personalizing, and manipulating key ideas from the text. Second, reading and writing are connected, as they draw upon common knowledge and cognitive processes (Shanahan, 2006). Consequently, improving students' writing skills should result in improved reading skills. Third, reading and writing are both communication activities, and writers should gain insight about reading by creating their own texts (Tierney and Shanahan, 1991), leading to better comprehension of texts produced by others.

This report provides evidence answering the following three questions:

1. Does writing about material students read enhance their reading comprehension?
2. Does teaching writing strengthen students' reading skills?
3. Does increasing how much students write improve how well they read?

Although writing is typically recommended as a part of a strong literacy program (e.g., Biancarosa and Snow, 2004), and several important reviews have selectively examined the impact of writing on reading (e.g., Applebee, 1984; Emig, 1977; Klein, 1999; Neville and Searls, 1991; Smith, 1988; Stotsky, 1982), the special strength of this report is that it comprehensively summarizes high-quality research using the powerful statistical method of meta-analysis. This technique allows researchers to determine the consistency and strength of the effects of an instructional practice, and to highlight practices holding the most promise.

*Writing Next* presented the results of a large-scale statistical review of research on the effects of specific types of writing interventions, and identified specific teaching techniques for improving the quality of adolescent students' writing. *Writing to Read* draws on the same type of statistical review of the research to highlight writing techniques shown to enhance students' reading.

To be successful, students today need strong literacy skills, and also need to be able to use these skills as tools for ongoing learning. This report builds on *Writing Next* by identifying writing practices found to be effective in helping students increase their reading skills and comprehension. We hope that besides providing classroom teachers with research-supported information about how writing can improve reading, our data will stimulate discussion and action at the policy and research levels, leading to the greater use of writing as a tool for enhancing reading and a greater emphasis on the teaching of writing in our nation's schools.

## The Recommendations

### Writing Practices That Enhance Students' Reading

This report identifies a cluster of closely related instructional practices shown to be effective in improving students' reading. We have grouped these practices within three core recommendations, here listed in order of the strength of their supporting evidence.

- I. **HAVE STUDENTS WRITE ABOUT THE TEXTS THEY READ.** Students' comprehension of science, social studies, and language arts texts is improved when they write about what they read, specifically when they
  - **Respond to a Text in Writing (Writing Personal Reactions, Analyzing and Interpreting the Text)**
  - **Write Summaries of a Text**
  - **Write Notes About a Text**
  - **Answer Questions About a Text in Writing, or Create and Answer Written Questions About a Text**
  
- II. **TEACH STUDENTS THE WRITING SKILLS AND PROCESSES THAT GO INTO CREATING TEXT.** Students' reading skills and comprehension are improved by learning the skills and processes that go into creating text, specifically when teachers
  - **Teach the Process of Writing, Text Structures for Writing, Paragraph or Sentence Construction Skills (Improves Reading Comprehension)**
  - **Teach Spelling and Sentence Construction Skills (Improves Reading Fluency)**
  - **Teach Spelling Skills (Improves Word Reading Skills)**
  
- III. **INCREASE HOW MUCH STUDENTS WRITE.** Students' reading comprehension is improved by having them increase how often they produce their own texts.

*Writing to Read* does not identify all the ways that writing can enhance reading, any more than *Writing Next* identified all of the possible ways to improve students' writing. However, all of the *Writing to Read* instructional recommendations have shown clear results for improving students' reading.

Nonetheless, even when used together these practices do not constitute a full curriculum. The writing practices described in this report should be used by educators in a flexible and thoughtful way to support students' learning.

The evidence is clear: writing can be a vehicle for improving reading. In particular, having students write about a text they are reading enhances how well they comprehend it. The same result occurs when students write about a text from different content areas, such as science and social studies.

This result is consistent with the finding from *Writing Next* that writing about science, math, and other types of information promotes students' learning of the material. In addition, teaching writing not only improves how well students write, as demonstrated in *Writing Next*; it also enhances students' ability to read a text accurately, fluently, and with comprehension. Finally, having students spend more time writing has a positive impact on reading, increasing how well students comprehend texts written by others. Taken together, these findings from *Writing to Read* and *Writing Next* highlight the power of writing as a tool for improving both reading and content learning.

## I. HAVE STUDENTS WRITE ABOUT THE TEXT THEY READ

Average Weighted Effect Size = 0.40 Published Standardized Norm-Referenced Tests (Based on 11 Studies)  
Average Weighted Effect Size = 0.51 Researcher-Designed Tests (Based on 50 Studies)

Comprehending a text involves actively creating meaning by building relationships among ideas in text, and between the text and one's knowledge, beliefs, and experiences (Wittrock, 1990). Having students write about a text should enhance reading comprehension because it affords greater opportunities to think about ideas in a text, requires them to organize and integrate those ideas into a coherent whole, fosters explicitness, facilitates reflection, encourages personal involvement with texts, and involves students transforming ideas into their own words (Applebee, 1984; Emig, 1977; Klein, 1999; Smith, 1988; Stotsky, 1982). In short, writing about a text should enhance comprehension because it provides students with a tool for visibly and permanently recording, connecting, analyzing, personalizing, and manipulating key ideas in text.

The evidence shows that having students write about the material they read *does* enhance their reading abilities. In fact, fifty-seven out of sixty-one outcomes (93 percent) were positive, indicating a consistent and positive effect for writing about what is read. The impact of writing about reading applied broadly across different levels of schooling, as students participating in this research were in grades 2–12, with the majority in middle or high school. These positive effects were evident when students wrote about text in science and social studies as well as in English (60 percent of comparisons involved these disciplines; see Appendix B).

These effect sizes compared favorably with effects obtained by other researchers examining the impact of specific reading approaches, such as reading programs at the secondary level, reciprocal teaching (a popular method for teaching comprehension), and vocabulary instruction. The effect size for writing about text that was read (0.40) exceeded each of these effects, providing additional validation of its effectiveness as a tool for improving students' reading comprehension.

Writing about read texts was also an effective activity for lower-achieving students. In twelve studies involving such students, the average weighted effect size for writing about a text was 0.63. However, the average weighted effect size for writing about text activities was not greater than zero when lower-achieving students were not explicitly taught how to use them. This was not the case when such instruction was provided, as was true in the other nine studies. Although these findings must be viewed cautiously due to the small number of studies, they suggest that having lower-achieving students write about text without teaching them how to do so may not be effective. Our findings are consistent with findings from other reviews that explicit instruction is an important ingredient in the successful teaching of literacy practices (e.g., Graham and Perin, 2007a; NICHD, 2000).

Writing about a text proved to be better than just reading it, reading and rereading it, reading and studying it, reading and discussing it, and receiving reading instruction. These above-mentioned reading activities were undertaken 87 percent of the time by students in the control conditions.

The average weighted effect sizes for writing about text read versus these control conditions was positive and significant (0.35 for published standardized norm-referenced tests in nine studies and 0.49 for researcher-designed ones in forty-four studies).

We next consider how different types of writing about reading activities influence students' comprehension of text. These analyses are based on the findings from the sixty-one studies above.

## Have Students Respond to a Text (Writing Personal Reactions, Analyzing and Interpreting the Text)

Average Weighted Effect Size = 0.77 Researcher-Designed Tests (Based on 9 Studies)

Writing an extended response to material involves either a personal reaction to the text or analysis and interpretation of it. The former includes writing a personal response to narrative material read or writing about a personal experience related to it. Analysis and interpretation activities, in contrast, focus on writing an analysis of the characters in a novel, writing a paper showing how to apply material that was read, composing a letter to another student explaining how to play a game described in a text, and analyzing a text in writing to develop a particular point of view. Newer and better understandings of textual material are likely to occur when students write about text in extended ways involving analysis, interpretation, or personalization (Langer and Applebee, 1987).

Our review of the data shows that extended writing has a strong and consistently positive impact on reading comprehension. All nine of the comparisons produced a positive outcome. Extended writing produced greater comprehension gains than simply reading the text, reading and rereading it, reading and studying it, reading and discussing it, and receiving reading instruction. These reading activities served as control conditions in all nine studies. (Note that in contrast to the other

### EXTENDED WRITING: EXAMPLES

With **guided journal writing** students respond to text by answering open-ended questions about it in writing. For example, students might be asked to analyze why they think characters acted as they did and indicate what they would do in the same situation.

Source: Wong, Kuperis, Jamieson, Keller, and Cull-Hewitt (2002).

Students might also be asked to complete an **analytic essay** about the material they are reading. For instance, after reading about the history of the industrial revolution, students might be asked to write an essay in which they identify the three most important reasons for industrial growth during the nineteenth and twentieth centuries and explain the reasons for each of their choices.

Source: Langer and Applebee (1987).

writing about reading activities studied in this review, students were not expressly taught how to write extended responses. Finally, for writing a personal response to text, students applied this procedure over a three- to fourth-month period in several studies.)

## Have Students Write Summaries of a Text

**Average Weighted Effect Size = 0.52 Researcher-Designed Tests (Based on 19 Studies)**

Transforming a mental summary of text into writing requires additional thought about the essence of the material, and the permanence of writing creates an external record of this synopsis that can be readily critiqued and reworked. As a result, summary writing seems likely to improve comprehension of the material being summarized.

Summary writing practices studied ranged from writing a synopsis with little to no guidance (e.g., writing a one-sentence summary) to the use of a variety of different guided summarizing strategies such as writing a summary of text using a set of rules or steps; developing a written outline of text and converting it to a summary; locating the main idea in each paragraph and summarizing it; and creating a written/graphic organizer of important information and converting it to a summary.

For students in grades 3–12, writing summaries about text showed a consistently positive impact on reading comprehension. Seventeen of the nineteen comparisons (89 percent) produced a positive outcome. While summary writing significantly improved middle and high school students' comprehension of text (average weighted effect size = 0.33 based on eleven studies), it had an even stronger effect on elementary students' comprehension (average weighted effect size = 0.79 based on four studies).

### SUMMARY WRITING: EXAMPLES

Students are directly taught rules for how to **write a summary of material read**. This can involve teaching them how to write a summary of a paragraph using the following operations:

- 1) identify or select the main information;
- 2) delete trivial information;
- 3) delete redundant information; and
- 4) write a short synopsis of the main and supporting information for each paragraph.

In teaching this strategy, the teacher first explains each step and its purposes. Use of the strategy is then modeled, and students practice applying it, receiving teacher help and assistance as needed.

Source: Rinehart, Stahl, and Erickson (1986).

A different summary writing method focuses on the summarization of longer text. Students begin by creating a skeleton outline, starting with a thesis statement for the passage. Next, they generate main idea subheadings for each section of the text, and add two or three important details for each main idea. They then convert their outline into a written summary of the whole text.

Source: Taylor and Beach (1984).

Writing summaries about a text proved to be better than simply reading it, reading and rereading it, reading and studying it, and receiving reading instruction. The above reading activities served as control conditions in all but four studies (74 percent). The average weighted effect size decreased slightly, to 0.48, when summary writing was compared to control conditions only involving reading activities.

## Have Students Write Notes About a Text

Average Weighted Effect Size = 0.47 Researcher-Designed Tests (Based on 23 Studies)

The act of taking written notes about text material should enhance comprehension (Kiewra, 1989; Peverly et al., 2007). This writing practice involves sifting through a text to determine what is most relevant and transforming and reducing the substance of these ideas into written phrases or key words. Intentionally or unintentionally, note takers organize the abstracted material in some way, connecting one idea to another, while blending new information with their own knowledge, resulting in new understandings of texts.

In the studies we reviewed, taking notes about text ranged from a prompt to take notes with little or no direction to the use of a wide variety of structured note-taking procedures such as developing a written outline of text; designing a written chart showing the relationship between key ideas, details, concepts, and vocabulary in text; and taking notes about text and separating these notes into different columns related to main ideas, details, and questions.

For students in grades 3–12, the various note-taking activities studied had a moderate and consistently positive impact on reading comprehension. Twenty-one of the twenty-three comparisons (91 percent) produced a positive outcome.

Taking notes about text proved to be better than just reading, reading and rereading, reading and studying, reading and underlining important information, and receiving explicit instruction in reading practices. The above reading activities served as the control conditions in all but two studies. The average weighted effect size increased slightly, to 0.48, when note taking was compared to control conditions only involving reading activities.

### NOTE TAKING: EXAMPLES

**Structured note taking** involves creating a written organizational structure for material read. With one approach, students are taught how to create an organizer resembling a flow chart, depicting changes in the events of a story over time.

Source: Denner (1987).

**Concept mapping** is another approach for helping students organize their notes about material read. Students place each important concept from text in a circle and then show how the concepts link together using words and lines. One way of teaching this strategy is to first present a model of an *expert concept map* for a particular reading. After discussing this map, students then practice completing other *expert maps* that are incomplete, moving from more to less complete maps, until they can create their own map for material read.

Source: Chang, Chen, and Sung (2002).

## Have Students Answer Questions About a Text in Writing, or Create and Answer Written Questions About a Text

Average Weighted Effect Size = 0.27 Researcher-Designed Tests (Based on 8 Studies)

Answering questions about a text can be done verbally, but there is greater benefit from performing such activities in writing. Writing answers to text questions makes them more memorable, as writing an answer provides a second form of rehearsal. This practice should further enhance the quality of students' responses, as written answers are available for review, reevaluation, and reconstruction (Emig, 1977).

For generating or responding to questions in writing, students either answered questions about a text in writing; received practice doing so; wrote their own questions about text read; or learned how to locate main ideas in a text, generated written questions for them, and then answered them in writing. These practices had a small but consistently positive impact on improving the reading comprehension of students in grade 6–12 when compared to reading or reading instruction. All eight of the studies resulted in a positive outcome for generating or answering questions in writing.

### QUESTIONS: EXAMPLES

**Answering questions in writing** involves writing responses to questions inserted into text or presented at the end of a segment of text. For example, students may be asked to write short answers to four questions (one detail, two inferences, and one main idea) after reading a segment of text. They then check and correct their responses before reading the next segment of text.

Source: Peverly and Wood (2001).

**Generating questions in writing** is a strategy where students create written questions about text. For instance, students are taught the difference between a good question and a bad question, and then practice generating and answering their own questions about text. If they cannot answer a question, they generate a new one that can be answered.

Source: Cohen (1983).

## II. TEACH STUDENTS THE WRITING SKILLS AND PROCESSES THAT GO INTO CREATING TEXT

While writing and reading are not identical skills, both rely on common processes and knowledge (Fitzgerald and Shanahan, 2000). Consequently, educators have long believed that the benefits of writing instruction carry over to improved reading. Our evidence shows that writing instruction does in fact strengthen a variety of reading skills.

### Teach the Process of Writing, Text Structures for Writing, Paragraph or Sentence Construction Skills (Improves Reading Comprehension)

Average Weighted Effect Size = 0.18 Published Standardized Norm-Referenced Tests (Based on 12 Studies)  
Average Weighted Effect Size = 0.27 Researcher-Designed Tests (Based on 5 Studies)

Teaching patterns for constructing sentences or larger units of text should improve reading skills. The practice of putting smaller units of writing together to create more complex ones should result in

greater skill in understanding such units in reading (Neville and Searls, 1991). This is the basic premise behind the writing instructional strategy known as sentence combining (Saddler and Graham, 2005). Better understanding of even larger units in text should be facilitated by teaching students basic structures for writing paragraphs, or common elements included in specific types of writing, such as persuasive essays.

Writing instruction did in fact show a small, but consistently positive, impact on reading comprehension when measured by both norm-referenced published standardized tests and researcher-designed tests. The outcomes in all studies were positive. The control condition in most of these studies (79 percent) was reading or reading instruction. When only these studies were considered, the average weighted effect size rose slightly, to 0.23 on published standardized norm-referenced tests (based on nine studies) and 0.30 on researcher-designed tests (based on four studies).

The effect of writing instruction on published standardized norm-referenced tests compares favorably with effects obtained in two other reviews examining the impact of a range of reading programs (Slavin et al., 2008) and vocabulary instruction (Elleman et al., 2009). (However, it was smaller than the effect of 0.32 obtained by Rosenshine and Meister [1994] for reciprocal teaching of comprehension strategies.)

It is important to note that there was variability in the types of writing instruction provided to students. These different types of writing instruction included the process approach, where students write frequently for real audiences; engage in cycles of planning, drafting, and revising text; take personal responsibility and ownership of writing projects; interact and help each other with their writing; participate in a supportive writing environment; and receive assistance and instruction as needed (Graham and Perin, 2007b). Note that studies examining process writing were limited to grades 1–4.

### WRITING INSTRUCTION: EXAMPLES

One writing instructional procedure that facilitates reading growth is **sentence combining**. With this method, the teacher models how to combine simpler sentences into more complex ones. Students then practice combining similar sentences. An interesting twist on this approach is to have students combine sentences in material they are reading or disassemble such sentences.

Source: Hunt and O'Donnell (1970).

Students' reading skills can also be enhanced by teaching them how to use **text structure** as an aid for writing text. To illustrate, students are taught the basic elements of persuasion by identifying and discussing them in model essays. They then write their own persuasive texts using these elements, and revise the texts based on feedback from peers and the teacher.

Source: Crowhurst (1991).

We also included studies where other writing skills were systematically and explicitly taught to students. In several studies, this practice involved teaching a variety of skills, including how to write sentences, paragraphs, and longer units of text. In other instances, it involved teaching students how to write

more sophisticated sentences by learning how to combine less complex sentences into more complex ones. It further included several studies where students learned to use the structure of specific types of texts as a model or tool for writing their own papers. Finally, the spelling of content words was taught in one investigation. Studies examining the effectiveness of these approaches (instruction in spelling; instruction in writing sentences, paragraphs, and longer units of text) were limited to grades 4–12. In these twelve studies, the average weighted effect size on norm-referenced standardized measures of reading was 0.16. (Although small, the effect was statistically significant and compared favorably to the 0.17 effect size obtained by Slavin et al. [2008] in their meta-analysis of middle and high school reading programs.)

### **Teach Spelling and Sentence Construction Skills (Improves Reading Fluency)**

**Average Weighted Effect Size = 0.79 Published Standardized Norm-Referenced and Researcher-Designed Tests Combined (Based on 4 Studies)**

Teaching students how words are spelled provides them with schemata about specific connections between letters and sounds, making it easier for them to identify and remember words in text containing these connections (Ehri, 1987; Moats, 2005/2006). The practice of putting smaller units of writing together in order to create more complex ones—from letters to words or words to sentences—should result in greater skill in understanding of these units in reading (Ehri, 2000; Neville and Searls, 1991).

In three of the four studies examining the impact of writing instruction on reading fluency, spelling skills were taught. In the other study, students were taught how to write more sophisticated sentences by combining simpler sentences into more complex ones. The overall effect size for these studies combined both standardized tests (two studies) and researcher-designed tests (two studies).

Writing instruction had a strong and consistent impact on improving students' reading fluency. *All* of the studies yielded a positive outcome. With one exception, the control condition was reading instruction. When the exception was eliminated, the average weighted effect size rose to 0.87. (Note that the studies reviewed all involved students in grades 1–7. Consequently, the impact of writing instruction on the reading fluency of older students is not known.)

### **Teach Spelling Skills (Improves Word Reading Skills)**

**Average Weighted Effect Size = 0.68 Published Standardized Norm-Referenced and Researcher-Designed Tests Combined (Based on 5 Studies)**

As noted above, teaching students how to spell theoretically makes it easier for them to identify and remember words in text (Ehri, 1987; Moats, 2005/2006). More explicitly, spelling and word reading rely on the same underlying knowledge, and therefore instruction and practice in one should aid development of the other (Ehri, 2000; Snow, Griffin, and Burns, 2005).

Spelling instruction had a moderate and consistent impact on improving students' word reading skills. The five studies examining the impact of writing instruction on word reading skills all involved spelling instruction. The overall effect size for these studies combined both standardized tests (two studies) and researcher-designed tests (three studies). All of the studies yielded a positive outcome. These findings support the claim that learning to spell supports reading (Graham, 2000; Moats, 2005/2006).

With one exception, the control condition was reading or reading instruction. Notably, when the exception was eliminated, the average weighted effect size rose to 0.77. (Because all studies involved students in grades 1–5, we cannot generalize the findings to older students.)

### III. INCREASE HOW MUCH STUDENTS WRITE

Average Weighted Effect Size = 0.30 Published Standardized Norm-Referenced Tests (Based on 6 Studies)

Reading and writing are communication activities, and writers can gain insights about reading by creating a text for an audience to read, even when the student is the intended audience (Nelson and Calfee, 1998). The process of creating a text prompts students to be more thoughtful and engaged when reading text produced by others. By writing, students learn to make their assumptions and premises explicit as well as observe the rules of logic when composing a text (Applebee, 1984), making them more aware of such issues in the material they read. Finally, writing involves generating meaning by using experience and knowledge to create a text and build relationships among words, sentences, and paragraphs (Wittrock, 1990).

According to the data we reviewed, increasing how much students write does in fact improve how well they read. The average weighted effect size on published standardized norm-referenced tests was small in all the studies we reviewed, but still consistently positive, as all studies yielded positive outcomes. The control condition in each of these experiments was either reading or reading instruction. Activities for increasing the amount of writing in the studies reviewed included writing about self-selected topics or topics chosen in collaboration with peers, setting aside fifteen extra minutes a day for sustained writing, using the Internet to write to pen pals, writing journal entries about daily experiences, interacting with others using a dialogue journal, and writing short passages using inference words. (Since all of the studies we reviewed involved students in grades 1–6, this finding cannot be generalized to older students.)

#### INCREASING STUDENTS' WRITING: EXAMPLES

**Pen palling** is a method in which two or more writers dialogue with each other about topics of interest. This can involve a younger student writing to an older student and vice versa.

Source: Dana, Scheffler, Richmond, Smith, and Draper (1991).

**Daily writing about self-selected topics** allows students to write about any topic of their choice. This can be done as a journal activity where the teacher reads and responds to something written by the student in a journal (without editing or correcting). Students sharing their writing with the teacher becomes optional over time.

Source: Peters (1991).

An average weighted effect size of 0.30 on published standardized norm-referenced tests compares favorably with effects obtained by other researchers examining the impact of specific approaches to teaching reading. It exceeded the overall effect of 0.17 for a range of reading programs studied by Slavin et al. (2008) as well as the effect of 0.10 for vocabulary instruction obtained by Elleman et al. (2009), and was equivalent to the effect of 0.32 obtained by Rosenshine and Meister (1994) for reciprocal teaching of comprehension strategies.



## **IMPLEMENTING THE RECOMMENDATIONS**

From its humble beginnings 5,000 years ago as a method of keeping track of stored goods, writing's value has skyrocketed. Writing and the explicit teaching of writing has played a central role in education in many historical periods, from the ancient Greeks through much of the twentieth century. The Greeks valued writing for its rhetorical and persuasive powers; the Romans prized eloquence in writing; and the British of the eighteenth and nineteenth centuries saw it as a tool for instilling moral values. As scholars began to study writing systematically, it became clear that the written word is an indispensable tool for communication and achievement. In today's electronic world, writing provides an almost instantaneous means for communicating with family, friends, and colleagues (Graham, 2006). People use writing to explore who they are, to combat loneliness, and to chronicle their experiences. Writing is beneficial both psychologically and physiologically (Smyth, 1998). Writing is also a valuable tool for learning (Bangert-Drowns, Hurley, and Wilkenson, 2004; Graham and Perin, 2007a), enabling us to gather, preserve, and transmit information with great detail and accuracy. The permanence of the written word makes ideas readily available for review and evaluation. Writing's explicitness encourages the establishment of connections between ideas, and its active nature can foster the exploration of unexamined assumptions (Applebee, 1984).

This meta-analysis provides empirical support for another important role for writing: as an effective tool for improving students' reading. Writing about text enhances youngsters' comprehension of it. Teaching students how to write strengthens their comprehension, fluency, and word reading skills. Increasing how much students write improves how well they read.

The impact of writing and writing instruction in this review was especially notable as its effects on published norm-referenced standardized tests rivaled the impact of directly teaching reading skills to students. While we are not saying that writing practices should replace reading instruction, these practices provide teachers and schools with another effective tool for strengthening students' reading skills. (See Biancarosa and Snow [2004] and NICHD [2000] for other effective practices.) Given the importance of reading to young people's social, academic, and eventual occupational success, as well as the large number of students who struggle with reading, this is a noteworthy finding. Yet despite its importance for reading, learning, communicating, self-expression, self-exploration, and future employment, writing is not yet a priority in many of our schools. The National Commission on Writing (2003) indicates that efforts to improve writing are virtually nonexistent in current attempts to reform schools.

Note, however, that the effects of these writing practices on reading are likely to be minimal for students who write infrequently or receive little to no explicit instruction in how to write. For example, Weber and Henderson (1989) found that more writing instruction produced greater reading gains than less writing instruction.

In a national survey of writing practices at the high school level, Kiuahara, Graham, and Hawken (2009) found that students were rarely asked to complete writing assignments involving analysis and interpretation. Assignments that involved writing more than a single paragraph occurred less than once a month in 50 percent of classes. Applebee and Langer (2006) reported similar results, based on data from the National Assessment of Educational Progress. Kiuahara and colleagues further indicated that high school writing instruction was infrequent, even in language arts classes, and increasingly infrequent in social studies and science classes. Many teachers (60 percent of science teachers, for example) reported that they felt unprepared to teach writing. Although teachers in the elementary grades spend more time teaching writing and are better prepared to teach writing practices (Cutler and Graham, 2008; Graham, Harris, MacArthur, and Fink-Chorzempa, 2003), most elementary students only spend about twenty minutes a day writing.

Many evidence-based practices for teaching writing already exist. In *Writing Next* (Graham and Perin, 2007a), eleven effective instructional practices for students in grades 4–12 were identified through a comprehensive meta-analysis of the writing intervention research (see Graham, MacArthur, and Fitzgerald [2007] for a more detailed presentation of these practices). A number of these writing practices, such as teaching writing processes or how to construct more complex sentences, also had a positive impact on students' reading skills in this review. The challenge is helping schools and teachers make these and other effective practices an integral part of their literacy programs. This report proves that good writing instruction is vital to realizing the goal of literacy for all.

## Putting the Recommendations into Practice

This report identifies writing practices that hold promise for improving students' reading. For one of the activities involving writing about text, **note taking**, the impact on reading was stronger when students were explicitly taught how to apply this skill. Other activities, such as **answering questions in writing** and **responding to text by writing a personal reaction or analyzing and interpreting it**, may also benefit from instruction, even though they had a strong positive impact on comprehension even when no instruction was given.

**Writing about text** activities had a positive impact on struggling students' understanding of a text. An important key to success in using these activities with lower-achieving students was to provide them with ongoing practice and explicit instruction.

### THE OPTIMAL MIX

Researchers do not know what combination or how much of the different writing about text practices should be emphasized. The four practices validated here—questions, note taking, summary writing, and extended response—serve different purposes. Consequently, how they are applied will depend on goals established by the learner and the teacher.

It is also likely that students will need more or less support in applying these practices, depending upon their familiarity with the practices and their own capabilities.

The **writing about text activities** validated in this review were applied with a variety of reading material, including narrative and expository texts. They were also effective in a variety of different disciplines, including science, social studies, and the language arts. Many content-area teachers do not use writing to promote students' learning (Kiuahara, Graham, and Hawken, 2009), but the findings from this report and *Writing Next* suggest that such techniques should be used more often. When students read texts in science, social studies, and the language arts, their comprehension of this material is improved by writing about it. Likewise, writing about information presented in math, science, and other content classes enhances their learning of this material, as was shown in *Writing Next*.

While most of the research (81 percent) examining the effectiveness of writing about text activities was conducted with students in grade six or above, such activities had a strong and positive impact on reading comprehension as early as second grade (Adams-Boating, 2001). Perhaps not surprisingly, writing about text activities was used almost exclusively in the language arts in the earliest grades (2–4), but by fifth grade such activities enhanced students' comprehension of science and social studies texts (see Appendix B).

**Writing instruction** that strengthened students' reading skills included both process writing and skills instruction. Both types of approaches to writing instruction were found to promote better student writing in *Writing Next*. Some literacy experts (Freedman, 1993; Smith, 1994) have argued that instructional approaches like

### COMBINING WRITING AND READING INSTRUCTION

One purpose of this meta-analysis was to look specifically at the effects of writing instruction on reading. It did not look at the effects of integrated reading and writing instruction on either reading or writing. But this does not mean that writing and reading instruction should be treated as separate entities. We believe that reading and writing instruction will be even more effective when they are designed to work together to achieve common goals and reinforce the reciprocal acquisition of central literacy knowledge, skills, and strategies.

process writing, which rely on informal and incidental learning methods, should not be combined with approaches that emphasize the explicit and systematic instruction of skills and processes. While there is very little evidence on this issue, studies have found that combining process writing with more explicit instructional approaches enhances students' writing (see Graham and Perin, 2007b). Further, teachers overwhelmingly view combining process writing and skills instruction as a positive practice (Cutler and Graham, 2008; Graham, Harris, Fink-Chorzempa, and MacArthur, 2002).

The National Commission on Writing (2003) recommended that schools double the amount of time students spend writing. Our finding that **increasing how much students write improves their comprehension of texts produced by others** is consistent with this recommendation (at least for grades 1–6). Writing time can be extended by having students use writing across the curriculum and write more at home.

Note that the fact that a writing intervention was effective in the studies we reviewed does not guarantee that it will be effective in all other situations. No intervention is effective with all students in all situations. These writing practices should be used and combined flexibly and thoughtfully.