



Technology-Enhanced Comprehension, Vocabulary, and Word Analysis Reading Intervention for Upper-Grade Elementary and Middle School Students

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Educational scholars, teachers, and administrators all have a stake in every student's chance to reach his or her potential. We know a great deal about what works, and for whom; now is the time to act.

Introduction to reading interventions for upper-grade elementary and middle school students

No Child Left Behind legislation mandates at-grade-level reading performance at third grade, yet the reality is that many children entering upper elementary and middle school still struggle to decode and comprehend the material¹ they face daily across the content areas. This challenge stems in part from underlying reading deficiencies facing struggling readers, but it also results from challenges inherent in reading expository text, a familiar genre past second grade. The compact, often decontextualized and hierarchical presentation of details that characterizes most elementary and middle school nonfiction, especially textbooks, can place daunting demands on even proficient readers, who often have not received explicit instruction in comprehension strategies specific to expository material. This type of reading material even more readily overwhelms readers who continue to struggle with basic decoding and vocabulary skills, and who, as a result, have less vocabulary background knowledge.

Research basis for direct, explicit comprehension, vocabulary, word recognition, and fluency instruction

Comprehension Instruction

The specific constellation of skills required to comprehend a given text depends largely on the nature of the text itself. Some kinds of text formats place few cognitive demands on the reader—in particular those with accessible plots or story lines that follow familiar and predictable schemas. Other kinds of texts, however, pose a much greater challenge. Informational books, textbooks, newspapers, and journal articles generally lack a consistent threading of plots and characters and do not follow predictable story line schemas. They also tend to present information relatively cryptically, resulting in a more compact, disjointed, and decontextualized presentation of details.

Comprehending these kinds of texts can place daunting demands on the reader,² requiring greater information-processing capacity³ and often a more systematic utilization of background knowledge the reader brings to the material.⁴

As expository text plays a prevalent role in one's academic and professional careers, comprehending it is critical. And, as it places relatively strenuous demands on the reader, instruction in expository comprehension is essential. Yet research suggests that most students, even those in middle school and beyond, are unable to effectively read expository material.⁵

¹ Graesser and Bertus 1998; Perfetti, Marron, and Foltz 1996; Weaver and Kintsch 1996

² Graesser and Bertus 1998; Graesser, Golding, and Long 1996; Kintsch and van Dijk 1978; Meyer and Rice 1984; Weaver and Kintsch 1996

³ Samuels 1989; Weaver and Kintsch 1996

⁴ Graesser and Bertus 1998; Perfetti, Marron, and Foltz 1996; Weaver and Kintsch 1996

⁵ Moustafa 1999

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It is therefore not surprising that a host of educators and researchers have investigated ways of teaching comprehension to readers of all ages. Such research has identified several useful instructional strategies.⁶

What Works?

- Front-load units by activating and building background knowledge.
- Help students develop purposes for reading.
- Explicitly teach and review reading strategies throughout the reading process: before, during, and after.
- Scaffold student learning through instructional interventions.
- Name and celebrate what students have learned: make accomplishments visible.
- Provide enough time for prereading, reading, and reviewing content, and learning strategies and skills.
- After reading, practice what has been learned: for example, reading strategies, skills, and text structures.

Vocabulary Instruction

Any comprehensive reading program must help students *consciously* develop vocabulary.⁷ The books and other reading materials that schoolchildren commonly use include more than 100,000 different words. While students enter school with a very small reading vocabulary, once in school a child's reading vocabulary is likely to soar at a rate of 3,000 to 4,000 words a year, leading to a reading vocabulary of about 25,000 words by the time he or she is in eighth grade and possibly more than 50,000 by the end of high school.⁸

Research indicates there are several features of word knowledge to consider: the extent to which a child knows a word⁹ (unknown, acquainted, and established); the word's complexity (for example, consider the many meanings of *run* [*run* to the store, a *run* on gym shoes, *run* in nylons, *run* into a friend, *run-over*, etc.]);¹⁰ the word's multidimensionality (for example, part of speech, level of formality); the concept that knowing one word sometimes depends on knowing the meaning of another word (for example, *submarine* involves understanding the base form, *marine*, and the prefix, *sub-*); and, lastly, the idea that some words are easier to understand than others. Knowing the word *apple* is different from knowing the word *abrupt*.

Research has also helped us understand the best features of good vocabulary instruction,¹¹ such as the value of direct instruction, including direct instruction on words that are critical to new content;¹² the use of imagery;¹³ word-learning strategies;¹⁴ and the importance of fostering word consciousness.

What Works?

- Teach words that will be highly useful to students.
- Teach word-learning strategies, such as the use of context, word parts, and the dictionary.
- Teach students that instruction in new words will help them learn additional aspects of words when they meet them in context.
- Foster word consciousness: an interest in words; a desire to use words well; and an understanding of the power of words, both to foster clarity and to obscure matters.

⁶ Alexander and Jetton 2000; Hiebert and Martin 2001; Nist and Simpson 2000; Palincsar and Brown 1984; Pressley, Woloshyn, and associates 1995; Duffy, Roehler, and Herrmann 1998; Pearson 1985

⁷ Beck, McKeown, and Kucan 2002

⁸ Graves, Juel, and Graves 2004

⁹ Beck, McKeown, and Kucan 2002

¹⁰ Nagy and Scott 2000

¹² Jenkins, Stein, and Wysocki 1984; Stahl and Fairbanks 1986

¹³ Powell 1980

¹¹ Marzano, Pickering, and Pollock 2001

¹⁴ Graves, Juel, and Graves 2004

Word Recognition Instruction

At the most basic level, fluent reading depends on automatic word recognition, which requires proficiency in phonological processing—the ability to identify and manipulate individual sounds within the English language—as well as the ability to identify letter strings and whole words orthographically, or by sight.¹⁵ As with comprehension, many educators have investigated ways of teaching word recognition to older students, focusing not only on basic decoding, but also on syllabification, morphological analysis, and word histories.¹⁶ Larger word units, such as syllables, base words, word roots, and Greek combining forms, become amalgamated as students successfully decode longer words;¹⁷ eventually these word parts converge to the point of automaticity. Theory explains and research shows that direct, explicit instruction in word recognition that includes units larger than basic sound/symbol correspondences (such as syllable types), as well as direct phonics instruction, bears fruit.¹⁸

What Works?

- Ensure that students understand the relationship between fluent word recognition and comprehension. That is, keep comprehension as the goal.
- Teach and reteach frequent sound/symbol relationships, especially frequent but complex vowel team patterns, and letter patterns associated with word origins, such as typical Greek letter/sound combinations (for example, *ch* pronounced /k/ as in *chemistry*).
- Ensure that teaching is active. Use word sorts, build words, and keep word work notebooks.
- Explicitly teach syllable types, as well as syllabification patterns and guidelines.

- Teach structural analysis: base forms (word roots and root words), affixes, and Greek combining forms.
- Scaffold student learning through instructional interventions.
- Name and celebrate what students have learned: Make accomplishments visible.
- Provide enough time for prereading, reading, and reviewing content, and learning strategies and skills.
- After reading, practice what has been learned: for example, reading strategies, skills, and text structures.

Fluency Instruction

Students need to read accurately *and* also fluently in order to understand what they read. One reason is the “no room to think” factor.¹⁹ When word recognition is difficult, readers have to devote so much energy to it that there is not enough cognitive capacity left for comprehension. Fluent readers are able to (1) recognize words automatically, (2) group individual words into meaningful phrases, and (3) identify unknown words rapidly by applying rapid phonic, morphemic, and contextual analyses. Fluency is often defined as the *rate* (words per minute) and *accuracy* (number of words correctly identified) with which students perform reading tasks. *Prosody*, or the rhythms and tones of spoken language, is an additional dimension to fluency. Whether text is being read silently or aloud, much of its meaning comes from the way it sounds. Students who read with expression are able to segment text into meaningful units, marking phrase and sentence boundaries with pauses, vowel lengthening, and changes in pitch and emphasis.²⁰

¹⁵ Perfetti 1984; Pikulski and Chard 2005; Stanovich 2000

¹⁶ Henry 2003; Moats 2000; Pinnell and Fountas 1998

¹⁷ Share 2004

¹⁸ Archer 1981; Gaskins, Ehri, Cress, O’Hara, and Donnelly 1996; Moustafa 1997; NICHD 2000; Templeton and Bear 1992; Cunningham 1990; Bear, Invernizzi, Templeton, and Johnston 2000

¹⁹ Camp, Winbury, and Zinna 1981

²⁰ Dowhower 1991

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There are many ways to build fluency. First and foremost, students become fluent by reading. It is well-documented that struggling readers spend less time reading, and when they do read, they read fewer words and often give up altogether because they make so many errors.²¹ It is for this reason that teachers are reminded that improving fluency is much easier and more effective if offered preventatively.²² That is, when it is observed that a student in the earliest years of instruction is at-risk, teachers need to take preventative measures to improve word recognition, boost vocabulary, increase fluency, and promote the use of comprehension strategies. Teachers can use several strategies to develop student reading fluency.²³

What Works?

- Provide opportunities for independent practice and rereading.
- Offer auditory modeling: listening to good models of fluent reading, which gives students the chance to hear where to pause, where to change pitch, where to place stress, and which segments to elongate.
- Include a reader's theater in the reading program—a natural and enjoyable way to encourage the rereading of familiar text.
- Use repeated reading of relatively easy text (with and without assistance) as an intervention strategy, where students read aloud a short, meaningful passage a number of times until they reach a predetermined level of fluency.
- Provide phrase-cued text, a written passage that is divided according to natural pauses that occur within and between sentences.
- Be aware of fluency norms: for example, third grade (fall), 50%, 77 wpm; fourth grade (fall),

50%, 99 wpm; fifth grade (fall), 50%, 105 wpm; sixth grade (fall), 50%, 131 wpm.²⁴

Research basis for including a technology component, including oral feedback, in a reading program for struggling readers

General Observations

According to Biancarosa and Snow, the authors of *Reading Next: A Vision for Action and Research in Middle and High School Literacy*,²⁵ “Professionals and lay people are increasingly voicing support for inclusion of this [technology] element in a literacy program, because technology plays an increasingly central role in our society. Technology is both a facilitator of literacy and a medium of literacy.”

As a tool, technology can provide instructional reinforcement and opportunities for guided practice. For example, there are computer programs, both computer-based and platform-based, that provide ongoing comprehension strategy instruction; fluency development opportunities; ongoing vocabulary instruction using structural analysis and context sensitization; embedded self-assessments and games; and speech feedback options.

As the authors of *Reading Next* suggest, “As a topic, technology is changing the reading and writing demands of modern society. Reading and writing in the fast-paced, networked world require new skills unimaginable a decade ago.”²⁶

Oral Feedback

Several research studies dating from the mid 1980s have investigated the effects of computer-generated word identification feedback and its effect on comprehension. In their study of 26 disabled readers, Olson, Foltz, and Wise showed significant benefits of speech feedback for both word recognition and reading

²¹ NICHD 2000

²² Torgesen 2004, 376

²³ Martinez, Roser, and Strecker 1999; Dowhower 1991; Allington 1983; Rasinski 1990, 2000; Samuels 1979; Kuhn and Stahl 2000; Meyer and Fulton 1999; Rashotte and Torgesen 1985; Torgesen, Rashotte, and Alexander 2001

²⁴ AIMSweb®, http://www.edformation.com/norms/reading_fluency.htm

²⁵ Biancarosa and Snow 2004, 19

²⁶ Biancarosa and Snow 2004, 19

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comprehension.²⁷ These findings were replicated in subsequent studies.²⁸

In a study conducted in 1992, students in grades 2 through 7 participating in a two-month training on computer-generated reading demonstrated progress in fluency and accuracy as well as improved willingness to engage with the text when reading. These findings were replicated using a Scandinavian multilingual test-to-speech system among 33 disabled readers, ranging from grade 2 to grade 7.²⁹

Finally, a number of studies have moved beyond looking at the general effects of computer-generated speech feedback on reading by attempting to determine the best way of presenting this feedback. In a study,³⁰ Reitsma demonstrated that speech-generated conditions resulted in higher reading rates than the reading-only condition, with less-able readers benefiting most. Studies have shown that the use of speech feedback helps readers overcome the barrier of poor decoding or word recognition skills and thus comprehend text otherwise inaccessible to them. Speech feedback is particularly effective for beginning or poor readers, whose constant struggle with individual word identification impairs overall comprehension. Another consistent finding is that students have positive attitudes toward using computers and are motivated to use them for instructional activities.³¹

What Works?

- Provide immediate, real-time feedback on ongoing comprehension.
- Use strategy instruction at the point of need.
- Provide computer-generated speech feedback, such as pronunciation or definitions of unknown words.

- Give feedback on performance, such as verification of correctness or lack thereof; elaborate on responses by providing bases for choosing one answer over another.

What does research say about the role of motivation in learning?

Any program is incomplete if its authors don't understand the role motivation plays in learning; motivational techniques aren't an integral part of research-based programs. Research shows that when students are deeply engaged in text interaction and motivated to understand over lengthy periods of time, their achievement in reading comprehension increases.³² In the National Reading Council's comprehensive report on the state of education for at-risk students, Snow, Burns, and Griffin confirmed that one of the main stumbling blocks that can prevent students from becoming skilled readers is a lack of motivation.³³

In a recent review of the literature on motivation, Guthrie and Humenick conclude that there is mounting evidence that certain classroom practices increase reading motivation and achievement.³⁴ The two researchers define motivation as, "[A] cognitive commitment toward reading to learn and to extending one's aesthetic experience." Motivation gives both energy and direction to reading, where reading is defined as "understanding the content of a text."

It is important to realize that motivation is not a unitary attribute. Teachers experience this phenomenon on a daily basis—for example, when they see that their students are clearly motivated to read some texts more than others. Additionally, there are different types of motivation: external motivation, internal motivation, and self-efficacy. External motivation is the seeking

²⁷ 1986

²⁸ Olson and Wise 1987; Wise, Olson, et al. 1989

²⁹ Lundberg and Olofsson 1993

³⁰ 1988

³¹ Reinking and Bridwell-Bowles 1996

³² Guthrie and Wigfield 2000

³³ 1998

³⁴ 2004, 329

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of recognition for excellence through some prize or benefit. Students who are externally motivated focus on gaining points, praise, or even money. Internal motivation is the seeking of benefits that the sheer act of reading confers on the reader. Students who are internally motivated have desires, interests, needs, and dispositions that are satisfied through various forms of reading activities. Self-efficacy means that students believe they have the capability to read well. When reading, they exhibit confidence and assume that even if a text is difficult, they can master it. Teachers use many practices to motivate students, from preteaching vocabulary (which makes text reading easier), to using classroom strategies that create expectation, and sometimes excitement, about the text. Examples of such practices include creating story impressions (what will this article be about?),³⁵ expectation outlines³⁶ (students generate questions before reading and the teacher organizes the questions into an outline), and procedures, such as the “request procedure” (students are encouraged to ask their own questions about the text as the text is read).³⁷

In a review of experimental studies on motivation—that is, studies that were controlled using both experimental and control groups—four practices were verified as having a sizable impact on reading motivation and can be viewed as major constituents of any long-term instructional program: adopting goals and purposes for reading, allowing choice, providing interesting texts, and allowing student discussion and collaboration.³⁸

What Works?

- Adopt goals and purposes for reading, including practices such as enabling students to use their background knowledge and experience, arranging for hands-on activities, modeling

the behaviors of a curious reader, engaging students in extended practice, providing effective feedback on students’ progress in relation to their goals, and creating classrooms that are mastery oriented.

- Allow choice, including practices such as providing choices for reading activities, understanding the role of choice in alternative cultures (some students prefer choice while others prefer to be given materials their teachers or parents say are important), providing choice in reading activities during ongoing instruction (such as giving students the choice of projects they might do in response to content learning).
- Provide texts that students find interesting, including texts about which students have some background knowledge, texts about topics somewhat familiar to the students, and texts that are visually both helpful and pleasing; consider a text’s relevance to the learners.
- Allow time for student discussion and collaboration; let students know that part of their work will include student collaboration.

How does it help students when instructional principles are embedded in the context of content material?

The research-based findings documented in the recent and influential RAND report indicate that much is known about comprehension instruction. Of the many findings, the report concluded that reading strategy instruction, when integrated into subject matter learning, improves students’ comprehension of text.³⁹ Language arts teachers routinely integrate subject matter when they teach a reading strategy using content material and/or when they use content material for practice opportunities. Subject-area

³⁵ McGinley and Denner 1987

³⁶ Spiegel 1981

³⁷ Manzo 1969

³⁸ Guthrie and Humenick 2004

³⁹ RAND Reading Study Group 2002; Biancarosa and Snow 2004; Guthrie and Humenick 2004, 333–39

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teachers embed this instructional principle when they teach comprehension skills and strategies that are particularly effective in their subject areas. A subject-area example would be a science teacher using the SQ3R strategy (survey, question, read, recite, review) as he or she introduced a chapter to be read partially in school and partially at home.

What Works?

- If you are a language arts teacher, extend the skill and strategy instruction you use for narrative text to content area material to facilitate learning from text.
- Coordinate instruction with content area teachers, coaches, and other subject-area teachers.
- Use aids and devices to help at-risk learners, such as graphic organizers, prompted outlines, structured reviews, and guided discussions.
- Use extended projects in which students practice reading strategies they have learned as they pursue a theme, read a variety of materials, and produce a product that is meaningful to the students (for example, creating a travel brochure).

Why is it important to use diverse texts at a variety of difficulty levels and on a variety of topics?

The RAND report also concluded that students benefit from exposure to different types or genres of texts (for example, informational and narrative texts). Texts differ in their appeal to students, their visual characteristics, their internal structure, their purposes, their point of view, and so on. For example, Caswell and Duke⁴⁰ indicate that increasing student access to informational (or expository) texts can motivate students who prefer reading this type of text

more than narrative text or who have strong interests in informational topics.

Guthrie and Humenick⁴¹ point out that when students need to integrate information from many types of texts for projects, such as presentations or written reports, the students' sense of "being in command of the topic fuels their confidence and arouses new curiosities, while providing a platform for understanding the content of new materials. This content emphasis encourages students to adopt mastery goals for reading activities and to read with purpose, rather than to merely complete assignments." Texts also differ in their level of difficulty, so offering texts at various levels supports all learners. All students, not just those reading at grade level, have the opportunity to read material at their independent or instructional levels. This practice is informed by the finding that when teachers carefully match reading level to a student's ability, reading becomes challenging but attainable.⁴²

What Works?

- Gather materials for themed work that reflect diverse reading levels, interests, and text type.
- Provide multiple ways of reading texts—for example, computer-assisted texts, tape-recorded texts, a partner reading strategy, individual reading, and so on.
- Provide opportunities to talk about multiple texts in study circles and in all-class discussions.
- Provide explicit instruction on how to integrate information about a topic from alternative text types. For example, show students how to use graphic organizers to organize the information they have found that answers questions generated by a student, the teacher, and/or a small group.

⁴⁰ 1998

⁴¹ 2004, 334

⁴² Gambrell, Palmer, and Codling 1993; Morrow 1996

What is the advantage of intense, individualized reading instruction?

Recent research on remedial interventions for older students shows converging evidence that educators can indeed close the gap in reading abilities between groups of students, even for students who are struggling to read. The finding, however, that more is not always better introduces an important complication that all teachers of reading must remember: additional, intentional instruction has to match the specific needs of the child.

“The actual reading impairment a child shows at any point is always the result of an interaction between the child’s degree of disability and the strength of instruction that has been provided. Children with a mild learning disability who are provided with only weak instruction ... show larger reading impairments when tested than do children with the same degree of learning disability who have had strong instruction. By the same token, children whose severe reading impairments persist within a strong instructional environment are likely to have a more serious learning disability than those whose reading impairments persist after receiving only weak instruction.”⁴³

What Works?

- Provide explicit, systematic instruction.
- Provide interventions for older students that are appropriately focused and sufficiently intensive.
- Differentiate instruction in general education classes to allow students access to important content.
- Provide strategic tutoring sessions, whereby tutors teach learning strategies (that is, how to

learn) while helping students complete their content assignments.

- Keep tutoring sessions either one-to-one or in small groups containing three to five students.
- Use ongoing formative assessments to ensure that instruction matches what the students can do and will need to do.

How and why does ongoing formative assessment matter for targeted growth?

The best instructional improvements are informed by ongoing assessment of student strengths and needs.⁴⁴ Formative assessments are assessments *for* learning, as opposed to assessments *of* learning. Teachers are engaged in formative assessment when they are finding out what students know and what teachers can do to plan appropriate instruction. Formative assessments and the instruction that follows can help ensure student success.⁴⁵ Remember that “[a]uthentic assessment of present day literacy cannot be fully ‘standardized.’ While prepackaged tests provide a rough index of reading and writing achievement, it is the classroom teacher who can most adequately monitor students’ ability to use language to think and communicate.”⁴⁶

Formative assessments augment information that teachers get from assessments of learning, such as standardized tests given at the beginning and end of the school year. Valencia and Buly⁴⁷ showed that students who received approximately the same scores on standardized tests had varying abilities in different enabling skills, such as phonological recoding, fluency, and comprehension skills and strategies. It was only through formative assessments, such as running records, qualitative reading inventories, and timed readings, that teachers knew “what students know or what they can do in order to plan appropriate instruction.”⁴⁸

⁴³ Torgesen 2004, 369–72

⁴⁴ Biancarosa and Snow 2004

⁴⁵ Graves, Juel, and Graves 2004, 417

⁴⁶ Calfee and Wilson 2004, 545

⁴⁷ 2004

⁴⁸ Graves, Juel, and Graves 2004

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What Works?

- Catalog data on a computer system that allows teachers, administrators, and evaluators to inspect student progress individually and by class.
 - Adjust instruction based on formative assessments.
 - Administer formative assessments frequently, on a daily basis when necessary.
 - Ensure that assessments examine different aspects of reading, from phonological recoding to comprehension, evaluation, and critical analysis.
 - Provide opportunities for students to monitor their own reading progress.
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How does ongoing summative assessment inform teachers, above and beyond formative assessment?

Summative assessments are assessments *of* learning. They are typically standardized, which means they are given to all students under similar conditions, usually have scripts that must be followed, are often timed, and are either norm-referenced or criterion-referenced. Norm-referenced tests measure a student's standing relative to others. For example, when standardized reading scores are reported as percentiles, teachers learn how many other students rank above or below a particular student. Someone at the 50th percentile falls right in the middle. A simple variation on the percentile is the grade-level equivalent, or GLE. A third-grader, for example, who scores 3.8 at the end of the year is doing about as expected, while a score at the 3.1 level would mean that the student is reading like a child just entering third grade.

Criterion-referenced tests, on the other hand, test what students are supposed to have learned. They include basal tests, as well as tests districts develop to monitor learning that those districts expect.

The principle guiding these tests is that students must meet a preset performance level. The class takes a 10-item test on vowels; students who are correct on nine items have “mastered” the objective or “met the standard.” Students who fall below the criterion are assigned additional practice on the objective until they attain a passing score.⁴⁹

There is a place for summative assessments in the classroom. First, summative assessments are reliable: there is a degree of consistency that is important to district administrators, and they fill the task of accountability reporting. Second, they are predictive: tests taken in the first years of schooling are correlated with tests taken years later. Third, they are valid: they measure what they say they will measure. Large differences both between students and within subtests of a standardized test warrant special attention.⁵⁰

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What Works?

- Use summative assessments as part of a balanced approach to assessment, where summative assessments do their accountability work and formative assessments work toward informing teachers, parents, and students how students are doing and what instructional steps teachers need to take next.
- Prepare students for standardized tests by giving them practice tests, if they are available, and by showing students throughout the year what an assessment question about content or a current skill or strategy being taught would look like.

⁴⁹ Calfee and Wilson 2004, 590–91

⁵⁰ Calfee and Wilson 2004, 593–94

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- Help students see summative tests as problems to be solved.
- Create an understanding that taking a summative test matters for “us”, not just for “me”.
- Familiarize yourself thoroughly with the test’s instructions.
- Advise students what to do when they don’t know the answer to a question.

How can professional development affect a program that is already well-articulated? And what does excellent professional development look like?

Current educational policies in the United States assume that up-to-date, well-researched teaching strategies and effective classroom management plans will begin to alleviate reading failure. For example, the Reading First program calls for quality teachers who can provide direct and explicit instruction in all five components of reading instruction: phoneme awareness, phonics, reading fluency, vocabulary, and text comprehension.⁵¹ Given the well-articulated programs available to schools currently—specifically comprehensive programs that provide materials and specify instructional dialog in detail—the question of why deep teacher knowledge is still so critical presents itself. The answer lies in an analysis offered by Louisa Moats, who suggests that teaching well goes far beyond following a program, no matter how well it is scripted:

“What does a teacher actually do? In the course of any day, the teacher must continually pique children’s interest in reading through incentive programs and discussions in which students respond to many kinds of texts, including stories, informational pieces, and poetry. The

teacher must also organize the class so that she or he can instruct groups of students according to their levels. The teaching of component skills must be direct, systematic, and explicit to get the best results. To accommodate children’s variability, the teacher must assess children and know how they are progressing. She or he must interpret errors, give corrective feedback, select examples of concepts, explain new ideas several ways, and connect many component skills with meaningful reading and writing experiences.”⁵²

Characteristics of Excellent Professional Development

Given that professional development, including high-quality preservice training, most likely affects students’ day-by-day interaction with any comprehensive program, the nature of professional development needs to be investigated. Though many questions have not been answered (for example, “What content and sequencing of content lead to effective professional development?”⁵³), educators at all levels are beginning to see some specific characteristics.⁵⁴

What Works?

Professional development that:

- Is ongoing and long-term
- Is content-focused
- Uses data from research studies of adult learning and the conditions needed to effect sustained change
- Is built into the regular school schedule
- Helps maintain, within schools and districts, a team-oriented approach

⁵¹ Armbruster, Lehr, and Osborn 2001

⁵² 2000, 6

⁵³ RAND Reading Study Group 2002

⁵⁴ NICHD 2000; RAND Reading Study Group 2002; Biancarosa and Snow 2004

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Concluding remarks

Many children entering upper elementary and middle school still struggle to decode and comprehend the material they face daily in their content classes. The purpose of this paper was to present the research basis for best practices intended to close the gap between successful and less-successful intermediate readers. We have recommended explicit, systematic instruction at every level of the reading process, with intensive instruction for those who need it.

Additionally, we have explored the role of motivation, technology, assessment, and professional development. Given the disheartening statistics about our middle-level readers—which demonstrate that perhaps 40% are not achieving up to an acceptable standard—we all need a vision for action. We hope this paper gives credence to the notion that educational scholars, teachers, and administrators all have a stake in assuring that all students have the chance to attain their highest literacy potential. We *know* a great deal about what works, and, often, for whom; now is the time to act.

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