The Scientific-Based Research Underlying Read:OutLoud™ and SOLO™

READ:OutLoud™
SOLO

The reading comprehension tool of:

SOLO™
by Don Johnston

DON JOHNSTON

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Underlying Read:OutLoud and SOLO

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DON JOHNSTON

26799 W. Commerce Dr. • Volo, IL 60073
800.999.4660 • www.donjohnston.com

Reading Comprehension Introduction

The meaning of text does not reside in the words on a page — meaning is constructed in the mind of the reader. According to the Reading Next report, "Very few older struggling readers (between fourth and twelfth grade) need help to read the words on a page, their most common problem is that **they are not able to comprehend what they read"** (Biancarosa & Snow, 2004, p. 3).

Proficient readers actively use a set of comprehension strategies to help construct meaning as they read (Keene & Zimmerman, 1997). Struggling readers typically do not approach reading in the same way as proficient readers. Struggling readers are less aware and have less control of their comprehension processes when reading (Baker, 2002). There is good evidence that struggling readers can improve reading comprehension skills by learning the strategies of proficient readers and putting them into practice (Dermody, 1988). Read:OutLoud technology **helps struggling readers learn research-based comprehension strategies and turn these strategies into habits** through guided and independent practice.

There are a number of strategies the National Reading Panel recommends as having good scientific evidence to increase reading comprehension. However, even after Durkin's landmark study (Durkin, 1979) on comprehension instruction, there is not enough time dedicated to comprehension instruction today.

Figure 1.1 Durkin, 1979

28 minutes (0.63%) devoted to comprehension instruction

Total = 4,469 minutes of reading instruction
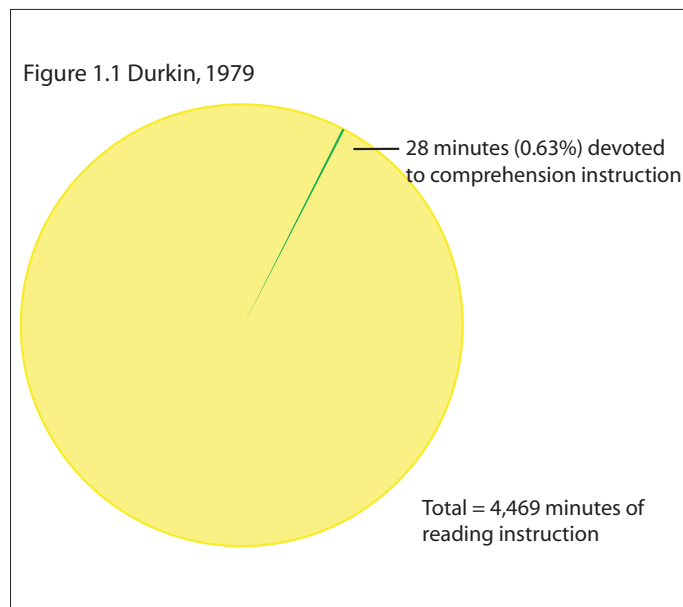
Durkin observed that within reading classrooms, only 28 minutes (0.63 %) of 4,469 minutes of reading instruction were devoted to comprehension instruction. Many teachers do not have sufficient time to spend with struggling readers who need individualized support. Read:OutLoud's instructional technology reinforces comprehension instruction by teachers and gives students more time to independently learn and practice the reading strategies of good readers and turn them into habits. Instructional technology allows students to spend more time meaningfully interacting with text than using traditional instruction methods only (National Reading Panel, 2000). This is significant considering 70 % of middle and high school readers need some form of remediation for reading comprehension struggles according to the Reading Next Report (Biancarosa & Snow, 2004).

Struggling readers who are given cognitive strategy instruction show significant reading comprehension improvement over students trained with conventional reading instruction methods (Dole, Brown & Trathen, 1996).

"As a tool, technology can help teachers provide needed supports for struggling readers, including instructional reinforcement and opportunities for guided practice" (Reading Next Report 2004, p. 19).

SOLO™ is the software tool specifically designed for struggling students for instructional reinforcement and guided practice. SOLO contains four learning tools (Read:OutLoud, Draft:Builder, Write:OutLoud and Co:Writer) that help students develop strategies in reading comprehension, writing, planning, organizing, revising and editing. Individually, each of these tools focuses on building skills in one aspect of literacy and includes supports such as high-quality text-to-speech, which increase independence (Williams, 2002). When used together in the SOLO environment, these tools integrate to have an even greater impact on student outcomes across the reading and writing continuum.

READ:OutLoud SOLO — Reading comprehension

DRAFT:Builder SOLO — Planning, organizing and draft-writing

WRITE:OutLoud SOLO — Revising and editing

CO:Writer SOLO — Empowering self-expression and vocabulary

Reading Comprehension Research

The National Reading Panel Report (2000) identifies eight categories of comprehension instruction that have firm scientific evidence for improving reading comprehension.

1. **Story Structure** - Readers learn to ask and answer who, what, where, when and why questions about the plot, and in some cases, map out the timeline, characters and events in stories.

2. **Comprehension Monitoring** - Students assess their understanding during reading and repair problems in understanding as they arise.

3. **Graphic Organizers** - Readers represent graphically (write or draw) the meanings and relationships of the ideas that underlie the words in the text.

4. **Question Answering** - Readers answer questions posed by the teacher and make inferences about concepts in the text. Students are given feedback about their answers.

5. **Question Generation** - Readers generate questions about who, what, where, why, and how pertaining to the text.

6. **Cooperative Learning** - Readers work together to learn comprehension strategies in the context of reading.

7. **Summarization** - Readers identify and write the main or most important ideas that integrate or unite the other ideas or meanings of the text into a coherent whole.

8. **Multiple Strategy Instruction** – Readers learn to use a set of reading comprehension strategies at appropriate times when needed.

Figure 1.2 Marzano, Pickering, & Pollock, 2001

Achievement Gain

[Bar chart showing Achievement Gain (y-axis, 0% to 50%) across Categories of Instruction (x-axis)]

- Question answering, cues, and advance organizers: ~22%
- Question generation: Generating and testing hypothesis: ~23%
- Setting Objectives and Providing Feedback: ~27%
- Cooperative Learning: ~27%
- Graphic Organizers/ Nonlinguistic representation: ~27%
- Summarization and note taking: ~34%
- Story Structure/ Identifying similarities and differences: ~45%
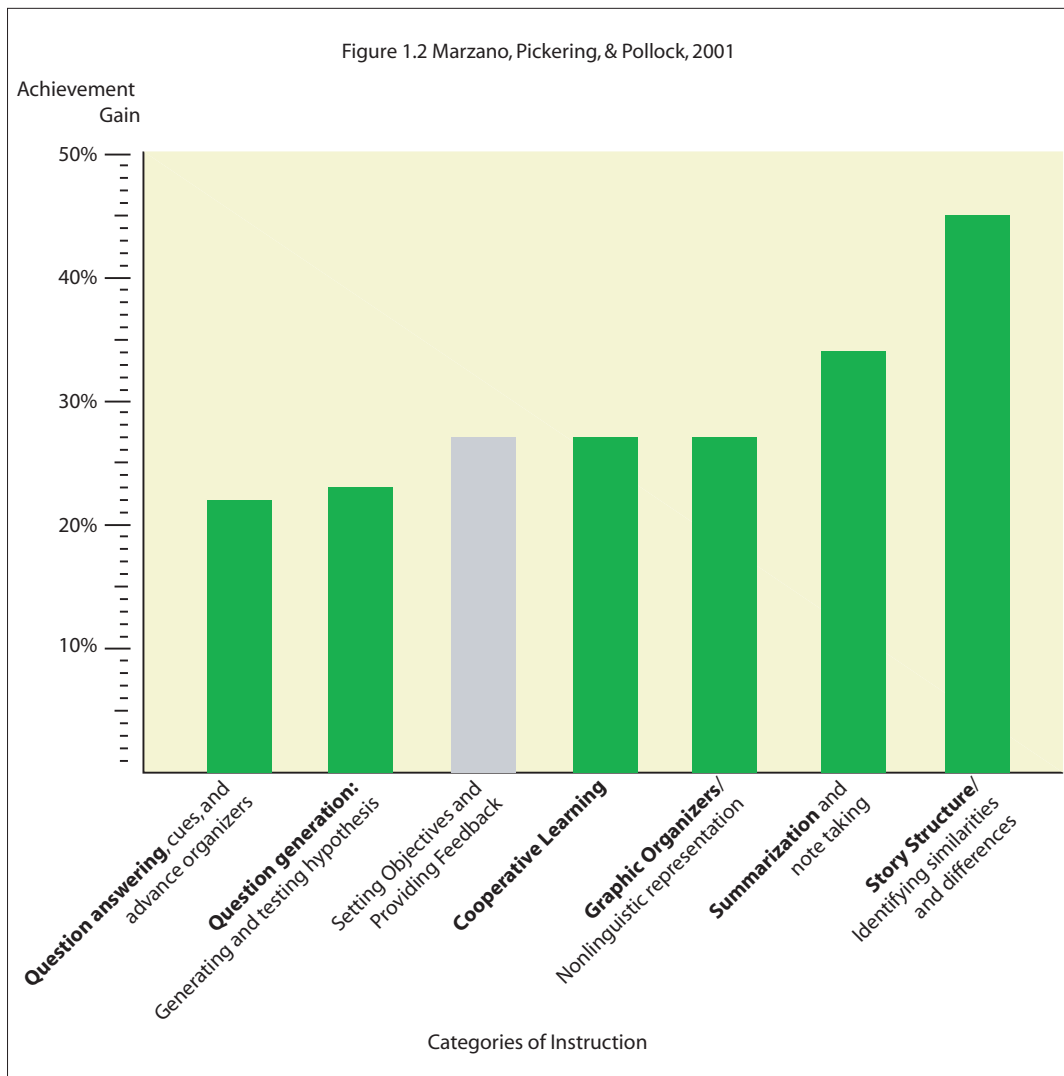
Categories of Instruction

Figure 1.2 shows the average student achievement gains made through the listed categories of instruction in over 42 studies (Marzano, Pickering & Pollock, 2001). This study identified instructional strategies with high impact across a broad range of student ability levels and ages. There is good evidence that these strategies have substantial impact even when compared with more traditional methods such as setting objectives and providing feedback.

On the following pages you will find more detailed information on how SOLO and Read:OutLoud support these research-based reading comprehension strategies and how these strategies are used across the curriculum to become reading habits. Students apply these habits to improve comprehension as they read grade-level literature, science or social studies texts across the curriculum.

"Technology is both a facilitator of literacy and a medium of literacy. Effective adolescent literacy programs therefore should use technology as both an instructional tool and an instructional topic"(Reading Next Report, 2004, p. 27).

Story Structure

Narrative Text

Awareness of story structure allows readers to ask and answer who, what, where, when and why questions about the plot and in some cases map out the timeline, characters and events in stories. "Story Structure is a procedure used extensively in reading comprehension of narrative texts. There are 17 studies over grades 3 through 6, about one-half of which were focused on poor readers. The success in treatment is more frequent with poor or below-average readers" (National Reading Panel, 2000, p. 4-45).

Based on Story Map by Beck., I. & McKeown, M. (1981). Developing questions that promote comprehension: The story map. Language Arts (Nov/Dec), 913-918.

Supported Reading Guides model reading comprehension strategies to help students approach text strategically. These guides can be used in conjunction with any text across the curriculum to help students build reading habits within the context of their content area coursework.

Read:OutLoud provides **story structure** Supported Reading Guides, which assist the reader in identifying main constructs and retaining them within the nodes of the outline. This outline forms a mental representation that can be arranged and modified to clarify understanding. This methodology is supported by van den Broek and Kremer (2000) who explain, "When reading is successful, the result is a coherent and usable mental representation of the text. This representation resembles a network, with nodes that depict the meaningful relations between the elements." Story structure Supported Reading Guides help students develop a fundamental understanding of text architecture. Repeated use while reading helps students internalize these structures, which become effective reading ***habits*** over time.

Informational Text

Text structure awareness builds understanding in both narrative and expository texts. Just as well-constructed narrative text consists of a predictable structure, so does well-constructed expository text.

Based on Comparison/Contrast Organization Form by Englert (1991). Making writing strategies and self-talk visible. Cognitive strategy instruction in regular and special education classrooms. American Educational Research Journal, (28), 337-372.

When successfully comprehending informational text, proficient readers address the text's overall organizational structure while being cognizant of the internal structure of ideas (Anderson & Armbruster, 1984). Read:OutLoud increases awareness of organizational structures and guides students through common informational text structures. When students are guided through a text's underlying structure, they improve their understanding and retention of key ideas (Ogle & Blachowicz, 2002).

Students who become aware of text structure increase their ability to think about and manipulate the concepts within the text structure. This leads to deeper comprehension of the subject matter. The common text structure "compare and contrast" featured above shows how this framework is imbedded in Read:OutLoud. When a student learns to compare and contrast, it has been found to have the biggest impact in overall achievement gains over many other instructional techniques (Marzano, Pickering & Pollock, 2001).

Outcomes

When struggling readers better understand the structure of narrative or expository text, they can approach the text with procedural knowledge.

Comprehension Monitoring

Supported Reading Guides direct students and guide them in their comprehension monitoring.
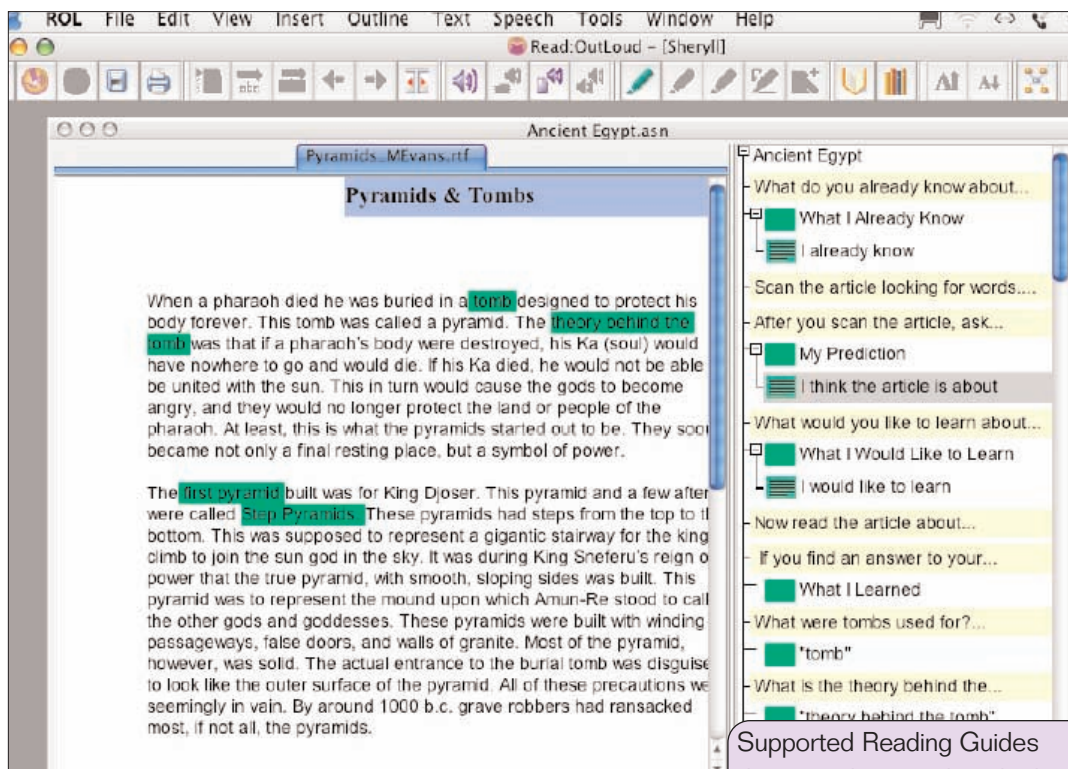
Based on KWL+ by Blachowicz, C. & Ogle, D. (2001). Reading comprehension: Strategies for independent learners. (pp. 108-111) New York: The Guilford Press.

Comprehension monitoring requires students to assess their understanding during reading and repair problems in their understanding as they arise. With Read:OutLoud, students can independently link comments to prompted questions within the text or one of the included Supported Reading Guides, which directs students and guides them in their comprehension monitoring. Cognitive awareness is built as students add information to their Supported Reading Guide and organize information to clarify their understanding and repair breakdowns in their comprehension.

*Trabasso and Bouchard (2002) analyzed 20 studies on comprehension monitoring and found that "Readers who were trained in comprehension monitoring improved on the detection of text inconsistencies, on memory for text, and on standardized reading comprehension tests" (p. 179).*

Outcomes

Struggling readers learn to identify when their comprehension breaks down and when to repair their understanding.

Graphic Organizers
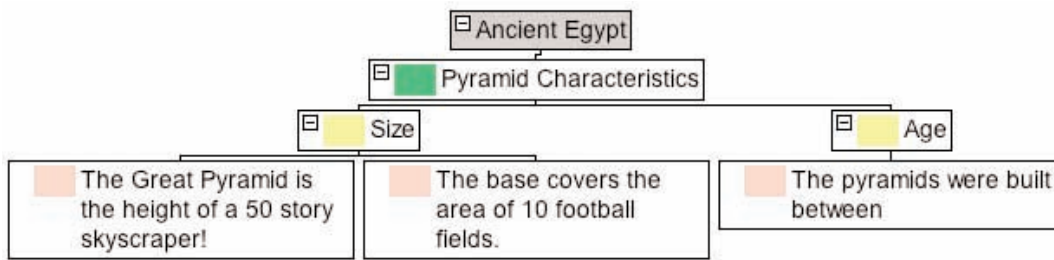
With graphic organizers, readers graphically represent the meanings and relationships of the ideas that underlie the words in the text. "The main effect of graphic organizers appears to be on the improvement of the reader's memory of the content that has been read" (National Reading Panel, 2000, p. 4-45). Students view their Read:OutLoud Supported Reading Guides and any information they add in a graphic organizer representation. This graphical representation directly matches the conceptual mental representation. "When reading is successful, the result is a coherent and usable mental representation of the text" (van den Broek & Kremer, 2000, p. 14).

Trabasso and Bouchard (2002) reviewed 11 studies that used graphic organizers. They found that "teaching readers to use systematic, visual graphs in order to organize ideas benefited readers in remembering what they read and improved reading comprehension and achievement in social studies and science" (p. 179).

Outcomes

Seeing information as a graphical map representation improves recall of key concepts and the relationship between key concepts.

Question Answering
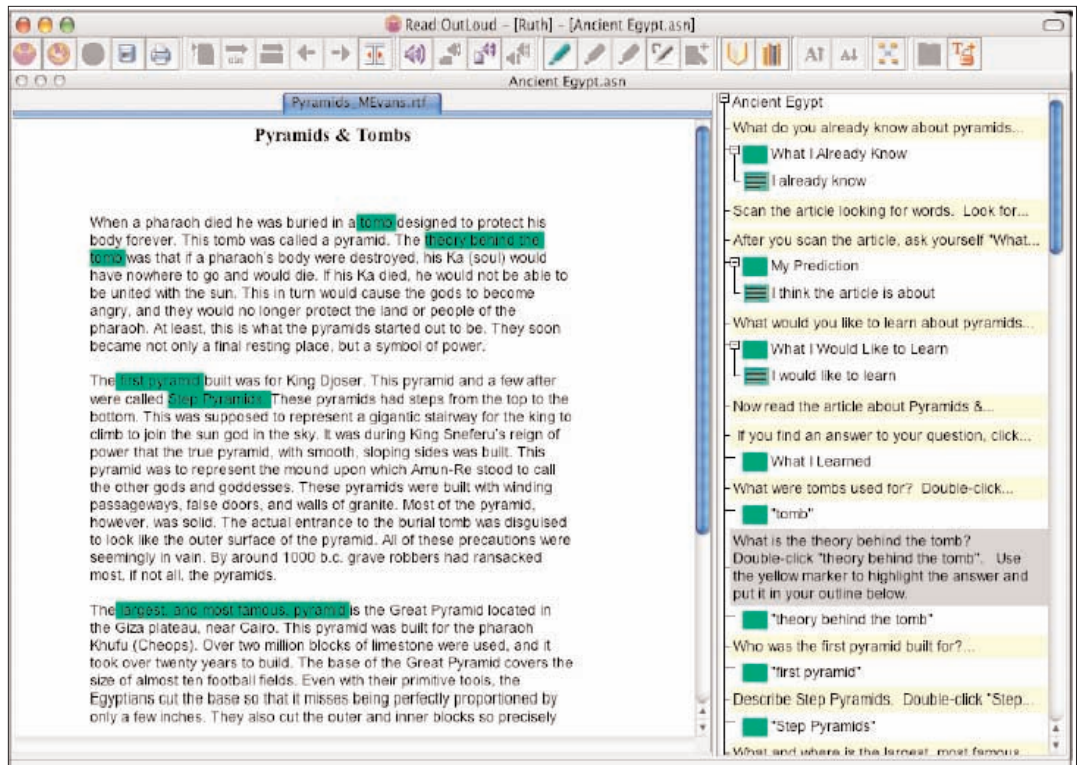
Question answering instructional practices provide a framework by which readers answer questions posed by the teacher and make inferences about concepts in the text. Question answering is at the heart of knowledge retrieval and forms the basis for most classroom instructional practices (Marzano, Pickering & Pollock, 2001). Supported Reading Guides contain questions to guide students as they read the text. They can also be customized to give a variety of cues and questions to support any classroom text. In Read:OutLoud, students can highlight information related to the answer with the eHighlighter or they can write a note with their own summarization of information that relates to the question.

Trabasso & Bouchard (2002) analyzed over 17 studies on questioning and answering and found that "instruction of question answering leads to an improvement in memory for what was read, in answering questions after reading passages, and in strategies for finding answers" (p. 181).

Outcomes

Struggling readers learn to apply their comprehension to answer problems and understand question-answer relationships.

Question Generation
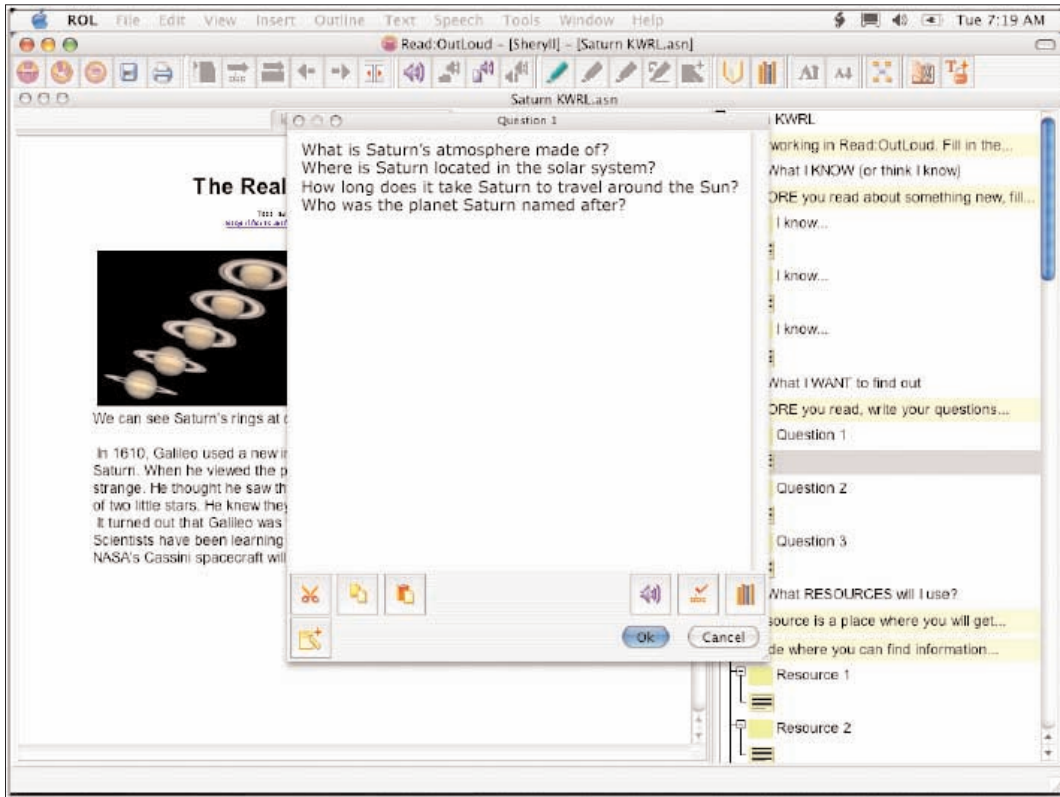
Question generation is a strategy whereby readers generate who, what, where, why and how questions while reading the text. Readers use these questions to confirm or reject prior conceptions and create new understandings. "The strongest scientific evidence was found for the effectiveness of asking readers to generate questions during reading" (National Reading Panel, 2000, p. 4-45). Read:OutLoud facilitates question generation by (1) cueing students with questions that help create mental connections with the text, (2) supporting students with Supported Reading Guides such as KWL and KWRL which prompt students to make text connections and (3) providing note-taking, highlighting and organizational frameworks where students can generate questions and test them against the text. This type of question generation requires students to actively engage in the text and have a clear understanding of it.

Students can ask questions, take notes or write personal reflections about the text. "The process of explaining their thinking helps students deepen their understanding of the principles they are applying" (Marzano, Pickering & Pollock, 2001, p. 105).

Outcomes

Struggling readers develop active thinking habits while reading, which deepen understanding.

Summarization
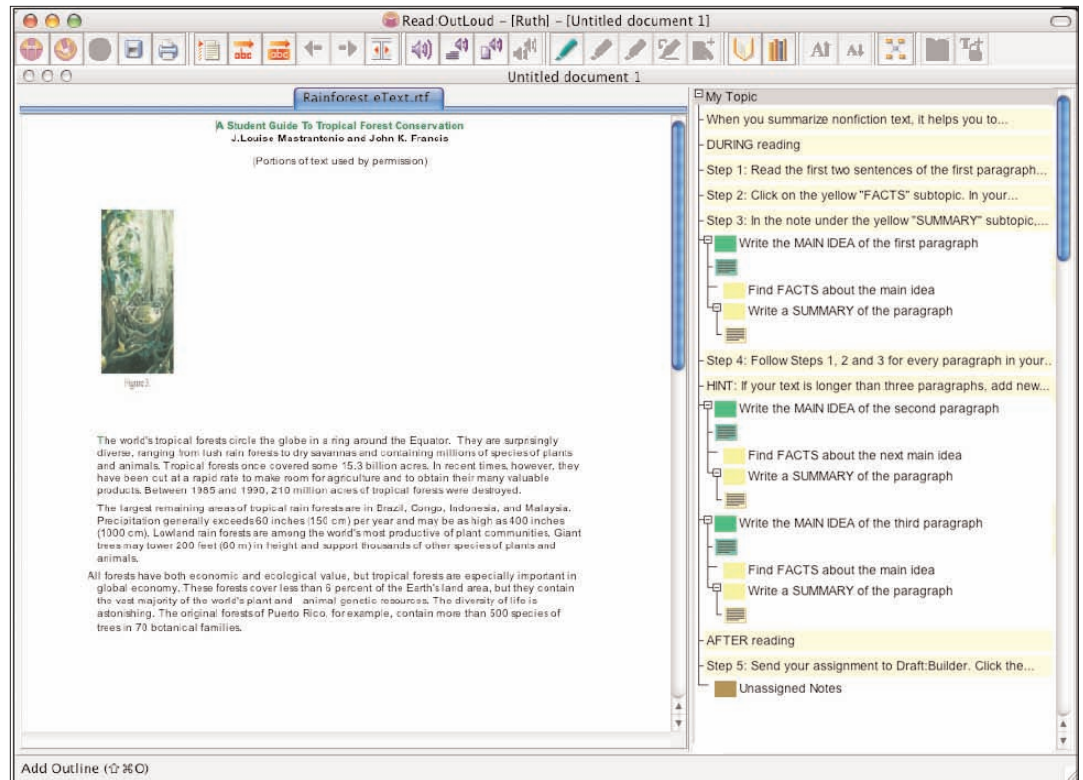
When summarizing, readers identify and write the main or most important ideas that integrate or unite the other ideas or meanings of the text into a coherent whole. With Supported Reading Guides, students are guided to identify important concepts and supporting details. Read:OutLoud makes this process easy. As students read, they identify important information within the text, which they add to their Supported Reading Guide. Students can organize information within their Supported Reading Guide to create an informational outline. This process helps students clarify their understanding.

Analysis of six independent studies showed an average gain of 34 % in achievement scores resulting from summarization instruction (Marzano, Pickering & Pollock, 2001).

"Instruction of summarization improves memory for what is read, both in terms of free recall and answering questions" (Trabasso & Bouchard, 2002, p. 182).

Outcomes

Struggling readers identify important information and recall textual concepts.

Multiple Strategy Instruction
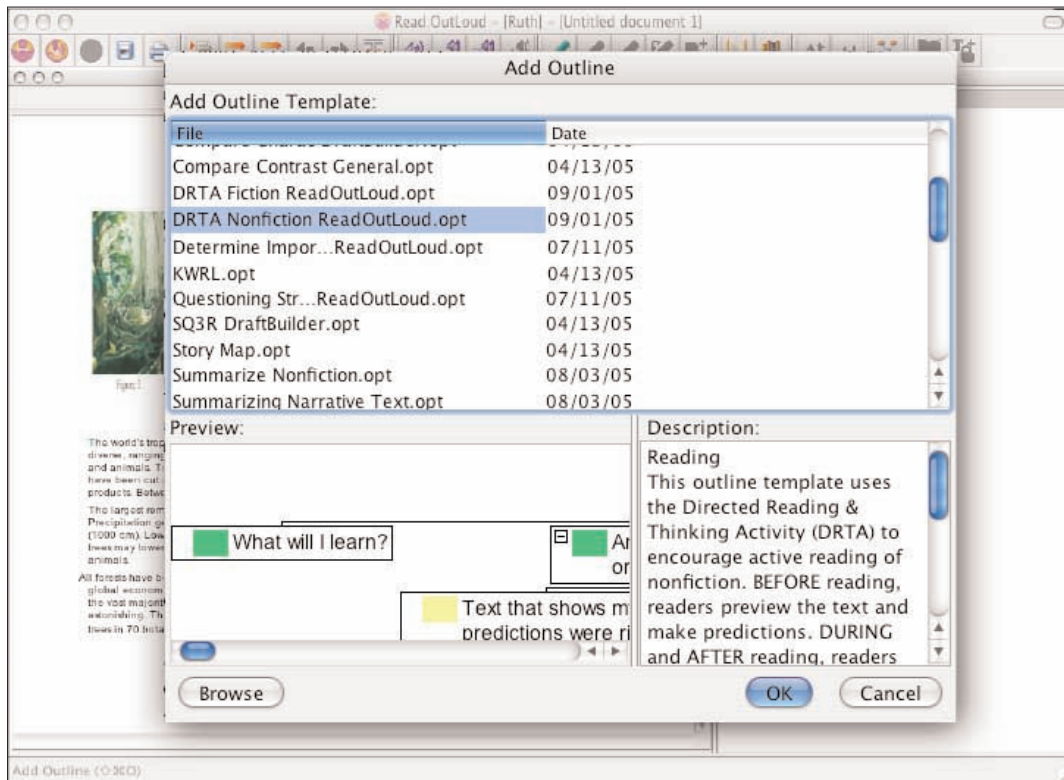
The purpose of multiple strategy instruction is to train readers to use a set of reading comprehension strategies at appropriate times.

> There is very strong empirical, scientific evidence that the instruction of more than one strategy in a natural context leads to the acquisition and use of reading comprehension strategies and transfer to standardized comprehension tests. Multiple strategy instruction facilitates comprehension as evidenced by performance on tasks that involve memory, summarizing, and identification of main ideas. (Trabasso & Bouchard, 2002, p. 184)

Dole, Brown & Trathen (1996) found that learning and applying strategies has more significant impact with at-risk students taking comprehension tests than other traditional methods including: (1) following instructional guides in the basal reading program and (2) teaching story content (key vocabulary, concepts and related ideas). In addition, they found good evidence that strategy instruction has long-term effects. Seven weeks after strategy instruction ended, students who learned to use strategies exceeded comprehension performance of those who were instructed through other methods. These students showed learning transfer in self-directed strategy use.

Figure 1.2 Dole, Brown, & Trathen, 1996

Average Test Performance

Categories of Instruction

Note: maximum test performance score was 30
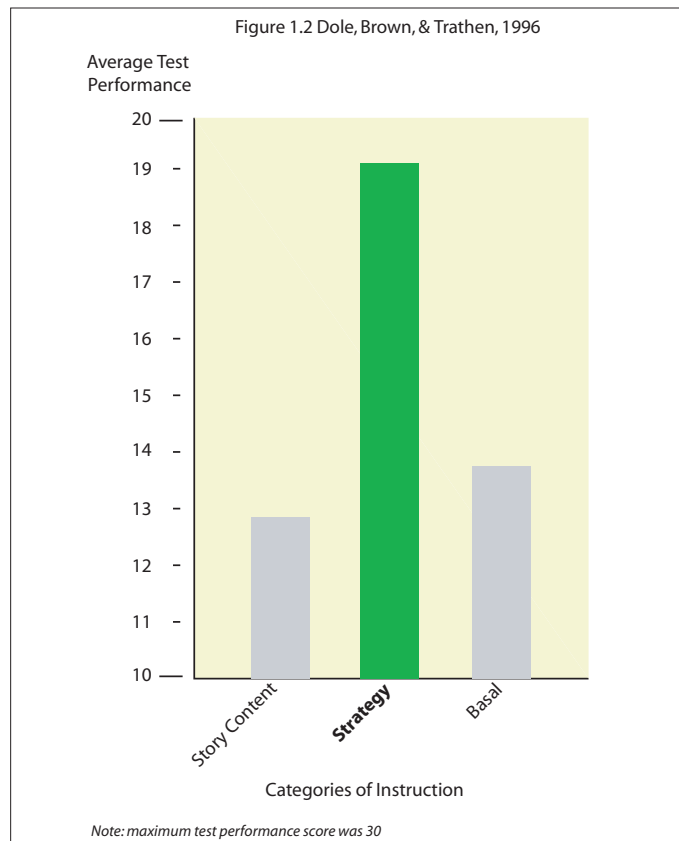
Read:OutLoud is structured to help students become self-directed in their use of multiple strategies while reading. Students can quickly and easily choose appropriate Supported Reading Guides among the multiple strategies presented. These strategies should be taught one at a time and applied to a variety of reading tasks (Keene & Zimmerman, 1997). Readers improve comprehension in Read:OutLoud by mastering a set of these reading strategies and using them in the context of reading curriculum-based texts and the Internet. Repetitive strategy will build reading **habits,** which generalize to other reading tasks.

There is good evidence that multiple strategy instruction is especially effective for struggling readers. In a meta-analysis utilizing 16 different multiple strategy instruction studies, Rosenshine and Meister (1994) found that the effects were large for good readers but were actually larger for poor readers!

The National Reading Panel (2000) found that "when used in combination, comprehension strategies produce general gains on standardized comprehension tests" (pp. 4-51, 52).

Outcomes
Struggling readers develop the strategies they need to actively think about concepts as they read and approach text most effectively for understanding.

Conclusion

The words on a page are constructed into a meaningful representation in the mind of the reader. The National Reading Panel found a number of well-researched strategies, which improve struggling readers' comprehension skills. Read:OutLoud was designed specifically to build these strategies in struggling readers. It does so by providing a framework where students spend more time independently learning and practicing the reading strategies of good readers and turning them into habits. Once they become habits, these reading strategies generalize to any other reading task.

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