The Settled Science of Teaching Reading

By Marisa Ramirez Stukey, Gina Fugnitto, Valerie Fraser, and Isabel Sawyer

Educators have been discussing the "right" way to teach reading for decades. While "balance" was called for nearly 20 years ago, dissension has reared its head again and arguments are breaking out among educators on social media. At the heart of the disagreement is the dichotomy between phonics instruction (the explicit teaching of letters and sounds) and a whole language approach (a focus on discovery and making meaning). While "whole language" as a term is not often used now, there are many who believe the term "balanced literacy" is simply a substitute for whole language.

In spite of the current discussions, the science on this instructional issue is settled. Castles, Rastle, & Nation (2018) lay out that there is a clear progression to effective literacy instruction. First and foremost, children need to understand the principles of spelling-sound correspondences and to solidify a store of high-frequency words to read words and phrases fluently. Most children need explicit teaching to build this knowledge. After decoding and high-frequency words are established, more attention can be devoted to comprehension with a focus on making meaning. Castles et al. (2018) offer a logical and research-based model. In spite of this research, educators remain without consensus about what is most important—phonics instruction or a focus on comprehension.
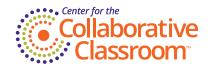
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Another current topic of discussion is the part knowledge plays in learning to read. While the importance of knowledge has been clear for over 40 years (see Cervetti & Wright, in press), current curriculum conversations have included demands to "build a body of knowledge." In this discussion, often only one way to build that knowledge is acknowledged: using connected text sets around specific topics. Research tells us, however, that there are many ways to build a body of knowledge and connected text sets is only one.

Our goal in this article is to wade through the soundbites, Tweets, and blog posts, and outline the settled science of teaching reading. While the arguments rage on, students are impacted (both negatively and positively) and teachers are often left unsure as to how best to teach. We hope to shed light on the issues and offer guidance and instructional considerations—all based on research. While we certainly won't address all the issues, we will tackle two topics in particular that have surfaced recently—explicit and systematic phonics instruction and building a body of knowledge.

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Revisiting and Rethinking the "Fab Five"

The National Reading Panel (NRP) report in 2000 identified the "fab five" of reading. The NRP identified instruction in Phonics, Phonological Awareness, Fluency, Vocabulary, and Comprehension as the elements research indicated were necessary for proficient reading. Unfortunately, the NRP did not prioritize the elements. While each of the five is essential, they are not equal. Comprehension is always the ultimate goal of reading and all of the other elements are *in service* of making meaning from text.

Explicit and systematic instruction in decoding (phonics, phonological awareness, and fluency) and vocabulary building are critical in achieving comprehension. Inherently misunderstood in the NRP report is that the purpose of instruction in phonological awareness, phonics, and fluency is to ensure that these processes become so automatic, students will not need to devote significant amounts of cognitive energy to them while reading. This automaticity leaves the cognitive energy for making meaning from the text.

While reading the words on the page has been a goal of early elementary instruction for some time, the role of vocabulary and comprehension has often been minimized in the early grades. Teachers are often told to teach kindergarten, first-, and second-grade students to "learn to read," and after third grade, students "read to learn." In fact, research tells us that children should be reading to learn from the very beginning of their school career (Houck & Ross, 2012). Building knowledge and an expansive and rich vocabulary are critical elements of comprehending text.

Explicit and Systematic Instruction in Decoding

There is no question that instruction in decoding leads to better readers. To develop as readers, students need instruction in the foundational skills to decode text and comprehension skills to make meaning of text. In her widely publicized article, Hanford (2018) states, "The basic assumption that underlies typical reading instruction in many schools is that learning to read is a natural process, much like learning to talk. But decades of scientific research has revealed that reading doesn't come naturally." This is settled science. In fact, it is so settled that prominent journals will no longer publish studies testing the effectiveness of phonics instruction (Hanford, 2018).

In their seminal work, Snow, Burns & Griffin (1998) state, "there is converging research support for the proposition that getting started in reading depends critically on mapping the letters and the spellings of words onto the sounds and speech units that they represent. Failure to master word recognition impedes text comprehension." Students must learn that words are made up of sounds, that letters represent sounds, and that there is a relationship between letters and the sounds they represent. They must also learn to rely on that knowledge in order to decode effectively so that they are able to read fluently and make sense of the text they are reading.

Learning to read seems effortless for approximately 5 percent of the population (Young, 2018). These "spontaneous readers" can give teachers a false sense of security. The terms "Third Grade Wall" or the "Fourth Grade Slump" arose because by third and fourth grade, "spontaneous readers" often struggle because they can no longer rely on other cueing systems to support their decoding. An additional 35 percent of the population is able to learn to read relatively easily. This group of students can also give teachers a false sense of security. These students may be able to decode "cat" easily but when they encounter a complex, polysyllabic word like "catastrophic," they have no strategies or knowledge for how to decode it. This situation points to the need for explicit instruction in polysyllabic decoding. Unfortunately, phonics instruction often ends at the simple alphabetic and spelling-sound phase of the continuum.

In polysyllabic decoding, sounding out words from left to right and recognizing basic sight words are not successful strategies in unlocking text (Just & Carpenter, 1987; Shefelbine, Lipscomb, and Hern, 1989). Students need instruction in the third phase of reading development, the polysyllabic-morphemic phase, in which they learn to read by syllables and morphemic units (Adams 1990; Shefelbine 1990). Students who are unable to decode polysyllabic words effectively pronounce fewer affixes and vowel sounds correctly, disregard large portions of available letter information, and are two to four times as likely to omit syllables as they read (Shefelbine & Calhoun, 1991).

Instruction at this more sophisticated phase includes:

• Morphemes

• Syllable types

• Syllable division rules

• Implications of the schwa

This instruction also needs to incorporate the flexible application of all that a student knows to decoding. Students "must strategically apply and broaden their knowledge base to accommodate the increase in complexity that comes with multisyllabic words" (Heggie, 2017). Students' increased ability to analyze and read polysyllabic words along with opportunities to read frequently and widely will impact their ability to comprehend text (Shefelbine, 1990).

Ultimately, the goal of reading instruction is not phonics proficiency. It is "to get students to the point where most of the words they encounter are automatically recognized so that their attention can be devoted to making meaning" (Rasinski, 2019). We do a disservice to students when we do not provide effective phonics instruction that allows them to develop the word-recognition strategies necessary to develop as fluent, automatic, proficient readers.

Small-group, Differentiated Instruction

There is a clear path to becoming a fluent reader who decodes accurately and automatically. The path includes explicit instruction on a continuum of foundational skills—the simple alphabetic phase, the spelling-pattern phase, and the more sophisticated polysyllabic and morphemic phase. Furthermore, the settled science has shown us that the traditional, whole-class phonics lesson is not the way to develop fluent readers. Students come to school with a variety of literacy experiences and knowledge about letters, sounds, books, and vocabulary, but whole-class phonics instruction assumes our students all have the same instructional need. Whole-class phonics is an "instructional misstep [that] means that fewer children will develop strong word-reading skills. In addition, ineffective phonics instruction is likely to require more class time and/or later compensatory intervention, taking time away from the growth of other important contributors to literacy development" (Duke & Mesmer, 2019). Snow et al. (1998) also assert that "...intensity of instruction should be matched to children's needs. Children who lack these understandings should be helped to acquire them; those who have grasped the alphabetic principle and can apply it productively should move on to more advanced learning opportunities."

How should we teach phonics, if not whole class?

1. Use data to determine the students' instructional needs along the foundational skills continuum; not all students need to start at the beginning.

2. Use this same data to group students for small-group differentiated phonics instruction. In their article, Duke & Mesmer (2019) affirm that "some children are able to develop letter-sound knowledge more quickly and efficiently than others" and advise providing differentiated phonics instruction.

3. Follow a clear scope and sequence. Both the content and sequence are essential in phonics instruction. A scope and sequence allows us to place students at their instructional point of need, teach in a systematic way, and adjust the intensity of instruction. As Duke & Mesmer (2019) assert, "across decades, evidence has accumulated to suggest that systematic phonics instruction with a scope and sequence will produce better outcomes than instruction that does not follow a scope and sequence."

4. Rely on explicit instruction. "There is evidence that explicit instruction that directs children's attention to the phonological structure of oral language and to the connections between phonemes and spellings helps children who have not grasped the alphabetic principle or who do not apply it productively when they encounter unfamiliar printed words" (Snow et al., 1998). "[E]xplicit instruction is direct, precise, and unambiguous (e.g., telling children what sound the letters /sh/ represent together, rather than making the connection indirectly or asking them to figure it out themselves)" (Duke & Messmer, 2019).

5. Respond to the needs of the students. On-going observational and assessment data allows us to respond to the students' needs and support their word-reading development (Duke & Mesmer, Winter 2018-2019). Snow et al. (1998) further clarify, "because the ability to obtain meaning from print depends so strongly on the development of word recognition accuracy and reading fluency, both of the latter should be regularly assessed in the classroom, permitting timely and effective instructional response where difficulty or delay is apparent."

6. Give students the opportunity to apply their learning immediately in connected text. The National Center for Education Evaluation and Regional Assistance (NCEE) recommends students practice reading new and familiar words or word parts in text "as soon as students can decode simple words" (Foorman, et al. 2016). Duke & Mesmer (Winter 2018-2019) affirm, "the evidence is clear that young children benefit from opportunities to read text that emphasizes letter-sound relationships they have learned to date. This reinforces the value of their hard work and of using decoding to read words."

The research is clear: students need differentiated, explicit, and systematic decoding instruction that is connected to text.

Comprehension: Building Knowledge and Applying Strategies

As with explicit and systematic phonics instruction, the role of knowledge in comprehension is also settled science. Without a body of knowledge, it's infinitely harder to make sense of text and, in fact, controlling for other factors, knowledge plays the largest role in comprehension (Cromley & Azevedo, 2007; Ozuru, Dempsey, & McNamara, 2009). In addition, the knowledge one has supports learning and retaining new knowledge.

In many classrooms, teachers utilize "activating prior knowledge" as a part of the reading process. However, activation of prior knowledge is significantly different than building a body of knowledge. Activation presumes the student already has background knowledge that needs to be brought forward. Building a body of knowledge, on the other hand, supports students in learning and deepening knowledge in topics they may or may not have been exposed to in the past. Building knowledge systematically adds to students' knowledge base and supports their comprehension.

Current conversation around this topic may lead one to believe that there is only one way to build knowledge—through connected text sets. Cervetti & Heibert (2019), however, offer multiple knowledge-building practices that both increase comprehension of the current text and build students' knowledge base to increase comprehension in the future. The first of their knowledge-building practices is wide reading. Reading volume has long been associated with general world knowledge (Stanovich & Cunningham, 1993). The more children read, the more they learn about the world (Sparks, Patton & Murdoch, 2014). Plenty of time for independent reading is one way for students to increase their knowledge base. A second and equally important way is teacher read alouds that introduce students to new topics and vocabulary. Wide reading also contributes to students' vocabulary, which, in turn, increases their capacity to learn more from texts they read (Stanovich, 1986).

Another knowledge-building practice is to ensure that students have exposure and access to engaging and conceptually rich texts, especially non-fiction. Informational texts are essential for students to build wide knowledge of the world (Anderson & Guthrie, 1999) and support students in both a deeper and wider view of particular topics. Students who are exposed to informational texts through read-aloud are often more likely to choose those kinds of texts for their independent reading (Dreher & Dromsky, 2000).

One way to ensure that students use their knowledge to comprehend texts is to ensure that higher-level questions and dialogue are a guaranteed part of reading instruction. A recent study indicated a shockingly low amount of time is devoted to students talking, listening, reading and writing about text (Jeong, Gaffney, & Choi, 2010). When students have regular and ample amounts of time to engage in both teacher-led and peer-to-peer discussions involving sophisticated texts and tasks, they deepen their knowledge and comprehension (Driver, Newton, & Osborne, 2000; Pappas, Varelas, Barry, & Rife, 2002).

Explicit comprehension strategy instruction is clearly connected to building a body of knowledge. The strategies of "making connections" and "inferring" rely on existing knowledge and integrating that knowledge with new information from a text to build deeper understandings. A significant body of research links students' knowledge with comprehension of text (Langer, 1984; Long, Winograd, & Bridget, 1989; Stevens, 1980). Students' schematic knowledge base is activated when reading similar representations of familiar concepts in text (Pressley, 2000). Building on the schematic representations that students have as well as activating and linking those representations to text comprises the strategy of making connections.

Readers use their knowledge of the world in many ways to comprehend text. One way is to make inferences about the text and better recall information that is both literal and inferential (Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989). A significant number of studies demonstrate the effects of training students to use their prior knowledge to make inferences (Brown, Smiley, Day, Townsend, & Lawton, 1977; Hayes & Tierney, 1982; Omanson, Warren, & Trabasso, 1978; Pearson, Hansen, & Gordon, 1979).

Another significant strategy that contributes to comprehension is visualizing—the direct action of making a mental image as one reads. Prior knowledge is essential to being able to create visualizations and students who are taught to visualize while reading are better able to make inferences, predict, and recall both literal and inferential information from the text (Center et al., 1999; Gambrell & Bales, 1986; Gambrell & Jawitz, 1993; Pressley, 1976; Sadoski, 1985; Truscott et al., 1995). Making a mental image contributes to retaining new learning since the information is stored as an image rather than words (Pressley et al., 1989; Sadoski, 1983).

The settled science of comprehension instruction tells us that students need to continually build a body of knowledge and that they build that knowledge through various avenues. In addition, identifying the knowledge and integrating it with comprehension strategy instruction is a powerful, evidence-based part of comprehensive reading instruction. Knowledge and the act of building on that knowledge using comprehension strategies are linked.

Next Steps: Connecting Research to Practice

Unfortunately, current conversations about the science of teaching reading have been reduced to sound bites, Tweets, oppositional letters, and blogs. Many times, the conversation devolves into "sides" where instructional approaches are relegated to an "either/or" choice. We advocate that there is no either/or. There is absolutely an AND. Students need explicit and systematic instruction in decoding. Full stop. They also need ample amounts of time to read and be read to so their knowledge, vocabulary, and love of reading builds. Full stop. Students need a wide range of knowledge about the world. This knowledge is essential to their growth as readers and thinkers. There isn't only one way to build that knowledge. There are many ways and as educators, we should take advantage of them all. Full stop.

Given what we know, our efforts should be devoted to ensuring that teachers have access to the research results and are given the tools that allow them to actualize this research with their students. Instructional time in classrooms should be supportive of the developmental process of reading on a continuum of learning—with more time devoted to decoding in the early grades and more time devoted to comprehension in the upper grades. That said, comprehension instruction is still absolutely necessary in our early grades—it's not an either/or, it's an AND. The science is settled.

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