Knowledge at the Center of English/Language Arts Instruction

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Teaser Text: Building students' knowledge is an important way to support their future reading. This article offers five practices for creating a knowledge-building classroom.

Pause and Ponder
- How much time do students spent reading conceptually and thematically rich texts in your classroom?
- What other opportunities do students have to build their knowledge of important concepts about the natural and social world?
- What resources are available in your school to create a purposeful, knowledge-focused ELA curriculum?

When we think about teaching literacy, we most often think about skills and strategies—the *how* of reading rather than the *what* of reading (Palincsar & Duke, 2004). Yet, dozens of studies over the last five decades have demonstrated the importance of the *what*—that is, the ideas within texts and the knowledge of those ideas that readers bring to the text (see Cervetti & Wright, in press, for a review of this research). Simply stated, the more readers know about the topics of texts, the better their comprehension and learning from texts (e.g., Alexander, Kulikowich, & Schulze, 1994; Gasparinatou & Grigoriadou, 2013). This is probably the best researched and least controversial statement we could make about reading. Many factors contribute to successful comprehension—accurate, fluent word reading, vocabulary knowledge, and use of strategies to prepare to read and fix up meaning when it breaks down—but in studies that examine these different contributions to comprehension, knowledge is the most important contributor (e.g., Cromley & Azevedo, 2007; Ozuru, Dempsey, & McNamara, 2009).

Why is knowledge so critical to comprehension? Cognitive theories of reading comprehension describe a process in which readers continually integrate their background knowledge with the propositions in a text as they build a coherent understanding of the text [e.g.,

Kintsch's (1998) Construction-Integration Model]. That is, readers use their knowledge to fill out meaning and make connections in text, and these connections help readers form local and global understandings about the text. Readers' knowledge makes the experience of reading more meaningful and helps them form rich associations with text, make mental images of the text, and remember what they have read.

In a classic example of how knowledge influences reading, Anderson, Spiro, and Anderson (1978) asked college-age readers to read and recall one of two passages—a narrative about dining in a fine restaurant or a narrative about supermarket shopping. The same food and beverages were embedded in passages in similar order, but the referents were more consistent with the experience of fine dining. Students recalled more of the food and beverage items when they read the restaurant passage, suggesting that students' ability to associate the items with their knowledge of fine dining made the foods more memorable.

Research has demonstrated that many different kinds of knowledge positively impact comprehension—from knowledge of the topic of the text (e.g., Alexander et al., 1994) to knowledge of the broader domain such as science (Gasparinatou & Grigoriadou, 2013) to cultural knowledge (Kelley, Siwatu, Tost, & Martinez, 2015) and general world knowledge (Best, Floyd, & McNamara, 2008). Knowledge is associated with better comprehension for readers from elementary students to adults. And, importantly, recent studies suggest that English language learners experience similar benefits from knowledge as students whose first language is English, showing stronger comprehension when they bring topic and general world knowledge to reading (e.g., Burgoyne, Whiteley, & Hutchinson 2013; Hwang, 2018).

To illustrate the role of knowledge, consider the two sentences that follow from the perspective of third or fourth graders. After reading each sentence, ask the question: *What knowledge would students need to understand this text?*

Sentence 1: A lion's golden coat blends in well with the grassy plains and open woodlands where the big cat lives (National Wildlife Federation, n.d.).

Sentence 2: Siberian tigers are considered endangered by IUCN's Red List.

One cause of their dwindling population is loss of habitat due to deforestation (Animal Facts Guide, n.d.)

Even these short excerpts call upon considerable background knowledge: the subject (lions or tigers), ecosystems (woodlands, grassy plains), lower-level earth and biological concepts (animal coats, population, habitats), and higher-level concepts (significance of camouflage for survival; endangerment and extinction of animals; challenges associated with deforestation). This knowledge is necessary for students to form connections with and possibly augment existing knowledge. Imagine the experience of reading these passages without this background knowledge.

In spite of the power and significance of knowledge for comprehension, knowledge building has often not been regarded as a primary goal of literacy education (Palincsar & Duke, 2004). As is described in the next section, two obstacles have hampered an emphasis on knowledge acquisition within literacy instruction.

Why Hasn't Knowledge Been a Focus of ELA Instruction?

Prioritizing Activation Over Knowledge Acquisition

In one sense, research showing the importance of knowledge *has* had a huge impact on educational practice in the form of *activating* students' existing knowledge about themes, events,

or concepts in texts prior to reading. The logic behind knowledge activation is that helping students bring relevant prior experiential knowledge to the foreground makes it more likely that they will use that knowledge to understand the text. An example of knowledge activation before students read an informational text such as *Germs make me sick!* (Berger, 2015), is to ask about times students have been ill or what they already know about germs. Or, a teacher might introduce a narrative story such as *Charlotte's Web* (White, 1952) by asking students about their experiences with friends, a core theme in the novel.

Activating knowledge can have benefits for readers who have relevant knowledge for the topic (e.g., Hansen, 1981; Spires & Donley, 1998). However, activating knowledge has limitations. First, knowledge activation activities are not particularly helpful for the students who do not have relevant background knowledge (e.g., Alvermann, Smith & Readence, 1985; Peeck, Van den Bosch, & Kreupeling, 1982). Typical knowledge activation activities can serve to privilege students from mainstream backgrounds and to marginalize students whose background knowledge may be less aligned with topics addressed in school. English Learners can be among those whose rich funds of knowledge are overlooked in knowledge activation activities (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). Second, as students focus on their existing knowledge about a particular text, they are not being supported in expanding their background knowledge in ways that support comprehension with future texts. Finally, knowledge activation activities can often focus on fairly superficial connections to the ideas of texts in order to generate interest, rather than calling up substantive knowledge that will enhance understanding of the text.

While knowledge activation has become a common instructional practice in reading instruction, *building* knowledge for reading has not (Palincsar & Duke, 2004). Knowledge building involves an emphasis on supporting understanding of big ideas and important concepts

through extended reading and other experiences. Returning to our earlier examples, building students' broad knowledge of germs has utility beyond understanding a particular text.

A False Dichotomy between Learning to Read and Reading to Learn

Two phrases are often presented as if they represent a sequence in students' reading development: "learning to read" and "reading to learn." The assumption underlying these terms is that students need to recognize words before they can begin learning content from texts (National Center to Improve the Tools of Educators, 1996). The "learning to read" phase involves students in reading simple stories with familiar content. Only after students have cleared the hurdle of the basics do they receive text with rich content—that is, texts about the natural world, machines, far-away cultures, and so forth.

It is true that accurate and fluent word recognition underlies proficient reading. However, the argument that students first learn to read and then use text to learn is fundamentally flawed. Often, young children are given "decodables" where the majority of words have regular grapheme-phoneme patterns, but concepts represented by the words can be trivial and, in some cases, nonsensical (e.g., texts about rams wearing tams and pushing prams). Even while students are learning to read words, they can and should have opportunities to build knowledge from texts with worthwhile ideas and words. Delaying attention to knowledge-building can be especially disadvantageous for students whose academic experiences occur primarily in schools.

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Five Knowledge-Building Practices

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We offer five practices that can increase an emphasis on knowledge *building* in classrooms. Whatever the reading level, the take-away message is that reading instruction needs to focus on building knowledge that will support students in understanding the texts at hand, while at the same time preparing them for future texts.

Practice 1: Ensure that students read a lot.

Becoming good at any complex activity, whether it is playing a musical instrument or reading, requires that individuals participate in the activity…a lot. As students read, they acquire world and word knowledge, consolidate reading strategies and skills, and gain insights into the nature and structure of different kinds of text. All of this creates momentum and motivation toward future reading. Student who don't read much do not achieve the same momentum or motivation. Stanovich (1986) referred to this phenomenon as the Matthew effect—the rich get richer and the poor get poorer.

In 1977 and again 30 years later, Allington asked the question, "If they don't read much, how they ever gonna get good?" (Allington, 1977, 2009). Reading volume, as Allington (2014) demonstrates in a review of research, can be increased in classrooms to good effect. Kuhn et al. (2006) found that increasing amount of reading by second graders, whether through wide reading or repeated reading, resulted in more growth in word reading, fluency, and reading comprehension, compared with student in classrooms where increased reading was not a focus.

Especially relevant for the theme of this paper, reading volume is associated with general world knowledge. In Stanovich and Cunningham's (1993) analysis of the contributions of general reading ability, reading volume, and television exposure to general knowledge among college students, television exposure was shown not to contribute to knowledge, but reading volume contributed substantial variance in tests of academic and everyday practical knowledge. In a replication of the Stanovich and Cunningham study, Sparks, Patton, and Murdoch (2014) confirmed the close connection between reading volume, reading achievement, and knowledge.

Even though the amount of time devoted to English/Language Arts (ELA) instruction has increased steadily over past decades, students appear to be spending less time reading in school.

Brenner, Hiebert, and Tompkins (2009) documented an average of just 18 minutes of "eyes on print" reading per day in 3rd grade ELA periods. Similarly, in observations of second through fourth grade classrooms, Jeong, Gaffney, and Choi (2010) found that the total number of minutes that students spent in talking, listening, reading, and writing related to all types of text was relatively small, averaging 44 minutes in grade 2 and 50 minutes in grades 3 to 4 across a school day.

There is no definitive answer to the question of how much independent reading students should do (Miller & Moss, 2013), but it is clear that opportunities for independent reading in classrooms are essential for reading development. There are several ways in which teachers can design their ELA periods and school days to increase the quantity and quality of students' reading.

Providing consistent times for independent reading is an important way to build the habit of reading. Students' stamina for reading can be supported by slowly expanding time devoted to independent reading and by establishing routines for documenting the amount of text that students read (Mesmer, 2015). Ensuring that students always have a text close at hand means that time that might otherwise be spent unwisely can be devoted to silent reading. Opportunities to read and to set goals for increased reading can be extended to out-of-school contexts through "take-home" books and reading logs, as well as home activities that involve families in reading and talking about books.

Teacher read-alouds serve to introduce students to new topics, genres, and authors. Consider, for example, the topic of the critical role of water on Earth for all living things— humans, animals and plants. Numerous texts can be found on the topic, such as *Water Princess* (Verde, 2016). This text communicates a true story about a young girl in Burkina Faso who daily

makes a long trek with her mother to get water. As part of the discussions that ensue from this read-aloud, teachers can introduce additional books on the topic that students can read on their own, such as *You wouldn't want to live without clean water!* (Canavan, 2014) and *One well: The story of water on earth* (Strauss, 2007).

Practice 2: Choose engaging and conceptually- and thematically rich texts.

Often, the texts that are assigned to students for reading instruction or even independent reading are based on evaluations from text complexity systems that predict the right level of texts for students, rather than on the content of texts (Hiebert, 2017). Choosing texts that have rich ideas and sophisticated themes can help students build world and word knowledge to support future reading. These texts can be of many different genres, including fictional stories, but access to high-quality informational texts is essential for students to become knowledgeable readers. Until quite recently, ELA instruction in elementary school classrooms was dominated by narrative text. In Jeong et al.'s (2010) study (described above), instructional time spent with informational text in grade two averaged one minute during four hours of instruction including reading, writing, language arts, science, social studies, health, and math instruction. At third to fourth grades, the amount was an average of 16 minutes. Other studies have found similarly low levels of informational text across the early school grades (e.g., Pentimonti, Zucker, & Justice, 2011; Yopp & Yopp, 2006). Creating a better balance of narrative and informational reading is vital for knowledge-enhancing classrooms.

Building sets of texts can increase the focus on knowledge. In addition to building knowledge, reading sets of related texts (also called "conceptually coherent reading" or "narrow reading") is associated with growth in vocabulary acquisition (Cervetti, Wright, & Hwang, 2016; Hansen & Collins, 2015). Standards can provide a good guide for creating concept-based text

sets, though another way to start is to select one excellent text and then build a set of texts around it.

In our work with teachers across the elementary grades, we have engaged students in reading sets of text on topics from birds to oceans. When we build the sets, we are careful to consider how concepts—e.g., about the diversity of life in the ocean or the ways that birds work together to protect their chicks—across books. We have witnessed how students are able to form sophisticated connections as we read and discuss the books (Cervetti, Wright & Hwang, 2015).

Even when working with individual texts, we work to maintain a focus on big ideas by asking ourselves: "What are the important ideas and themes in this text? How can I help students understand and engage deeply with these ideas in and beyond the text? What other kinds of insights about text and language can students glean from this text?"

A critical question that frequently arises in discussions with teachers about knowledge-building is: *What knowledge should we be building? What should children be reading about?* There is value in a wide range of knowledge and themes. Standards are an excellent guide (see NGSS Lead States, 2013), and connecting to content-area instruction is a powerful (and time-economical) practice. Consider complementary instruction across science or social studies (or math or music or art or physical education) and ELA. The integration of ELA with science investigations has proven to be particularly productive with several studies showing positive impacts on students' literacy learning and conceptual knowledge (e.g., Cervetti, Barber, Dorph, Pearson, & Goldschmidt, 2012; Guthrie, McRae, Coddington, Lutz Klauda, Wigfield, & Barbosa, 2009; Romance & Vitale, 2001).

Practice 3: Teach student to use their knowledge to comprehend text

Even when students have relevant knowledge, they are not necessarily skilled at bringing that knowledge to bear on texts. They often either fail to bring their knowledge to the text (Barnes, Ahmed, Barth, & Francis, 2015; Brandão & Oakhill, 2005) or they activate their knowledge—relevant and irrelevant—in an unconstrained way, making it difficult to achieve a clear understanding of the text (Cook & O'Brien, 2014). This pattern is evident in Brandão and Oakhill's study where they first asked 7- and 8-year olds literal and inferential questions about a text they had read, followed by a request for students to justify their answers ("How do you know this answer?"). Brandão and Oakhill found that students relied mainly on the text in answering questions, even questions that were designed to require integration between prior knowledge and textual information.

Being able to form inferences to prior knowledge and to ideas encountered previously in texts is an essential skill underlying successful reading comprehension (Barnes et al., 2015; Denton et al., 2015), but students may need support to develop this skill. Ways of such support include teaching students to activate knowledge from memory—as they read, not just as a prereading activity—and teaching them to integrate that knowledge with information in a text. There are several ways to support students' skill in forming inferences.

First, higher-level questions invite students to form connections to ideas, situations, and experiences beyond the particular piece of text being discussed. In doing so, they demand the use of prior knowledge. Higher-level questions are questions that reach beyond the facts or events of a text toward "generalization, application, evaluation, or aesthetic response" (Taylor, Peterson, Rodriguez & Pearson, 2002, p. 18). Going back to the earlier excerpt about lions' coats, higher-level questions or prompts might invite connections to big scientific concepts, such as survival (e.g., How might being able to blend in help lions survive?) or might ask students to connect this

fact about lions to other animals they have read about (e.g., Let's think about other animals that blend in with their environments).

Higher-level questions are the first step. They need to be followed by dialogue in which students provide evidence, examples, clarification, and elaboration, if inferencing and knowledge-building are to occur (McElhone, 2012). Opportunities to engage in teacher-led and peer-to-peer discussions involving sophisticated texts and tasks have been shown to lead to knowledge and comprehension development (e.g., Driver, Newton & Osborne, 2000; Pappas, Varelas, Barry, & Rife, 2002). The effects of social collaboration can result in increased motivation on the part of students and achievement, including higher levels of engagement with texts (Antonio & Guthrie, 2008). Various forms of social collaboration, including student-led discussions and text-based collaborative reasoning (Wilkinson & Son, 2011) can aid students' knowledge building. Digital contexts also offer promise in expanding the options open to teachers and students in creating collaborative contexts where students engage in knowledge building activities with peers within their immediate educational contexts and also extended contexts (So, Seah, & Toh-Heng, 2010).

Second, explicit instruction about how to make different kinds of connections in text can support inference-making. In particular, modeling for students how to form connections and bringing knowledge to bear can be effective. Turning again to the lion sentence presented earlier in this paper, a teacher might model connections through statements such as the following:

- "When I read this sentence about lions, I thought about what I know about how lions look…here's what I picture in my mind…" (connection to prior knowledge)
- "I am remembering a picture I saw of a lion in the grass…" (connection to a previously encountered visual text)

- "I remember that earlier in the passage it described how lions hunt for food. I bet the ability to blend in is really helpful for hunting…" (connection across different parts of a text)

Third, a range of media, including texts, objects, images, and cartoons can be used for practice in inferring. A well-known Gary Larson cartoon is set in a pet shop. On one side of the shop is a cat with wooden front legs peering across the shop to a fish bowl labeled "Piranha, $29.99." A discussion aimed at inference-making around this cartoon might begin with a question such as "What is happening—or has happened--in this cartoon? How do you know?" To understand this cartoon, readers need to bring prior knowledge about pet shops (very different animals coexisting), cats (like to eat fish), and piranhas (violent, flesh-eaters) but, at the same time, students need to make the connection that, at some point, the cat tried to eat the fish and was injured in the process.

These are the same kinds of connections—to prior knowledge and across different parts of a text—that make reading meaningful. The formation of connections helps us to construct richer meaning than just describing what we see or describing the literal events of a text. Authors, like cartoonists, don't tell us everything, relying on their viewers to make connections and fill in meaning. Similarly, educators want to teach students form many kinds of connections, including making links between different parts of a text, bringing prior knowledge to the text, associating words to their meanings, and summarizing and inferring big ideas, themes, and morals.

Practice 4: Don't sacrifice content-area instruction

Above all, teachers should focus on teaching content (e.g., science, social studies) in designated times as well as by integrating content into ELA periods. In 2007, Morton and Dalton

described that the time spent in social studies instruction was diminishing. This pattern was confirmed in a 2011 report (Scull & Winkler, 2011) that showed a drop of 18 hours in instructional time spent on social studies in elementary schools between 1987 and 2003. Blank (2012) found that instructional time in science had dropped to an average of 2 hours per week by 2008, the lowest level for more than two decades. In contrast, time spent on ELA instruction averaged 11.7 hours per week. Blank also reported that the amount of time spent on science instruction was associated with National Assessment of Educational Progress (NAEP) science scores at grade 4. Findings such as this are an indication that students are having fewer opportunities to engage in content-area learning.

Sacrificing content-area instruction denies students opportunities to develop the critical knowledge needed for success later in school as well as college, careers, and engaged citizenship. We have worked with teachers and on curriculum development projects that bring a strong focus on literacy in content-area instruction (e.g., Cervetti et al., 2012). These literacy experiences are designed to support students' growth in content knowledge in ways that support students' involvement and success in content-area investigations. In our science units, students read, write, and talk as they investigate, using many of the literacy practices that professional scientists use in their work. For example, students read accounts of other scientists' investigations as they plan their own, and they use field guides and reference books to make sense of their observations. Forming connections to content-area disciplines does not mean turning to content-area textbooks for ELA instruction. A topic can be explored in depth with numerous different types of texts (including trade texts and magazine articles), demonstrations, and experiments.

Practice 5. Give students reasons to read (and write).

Reading and writing for authentic purposes has been shown to predict growth in reading and writing (Purcell-Gates, Duke, & Martineau, 2007). Duke, Purcell-Gates, Hall, and Tower (2007) define authentic literacy activities as those that "replicate or reflect reading and writing activities that occur in the lives of people outside of a learning-to-read-and-write context" (p. 346). That means that reading and writing serve purposes other than simply "doing school." In addition, giving students reasons to read places a premium on in depth knowledge, is motivating, and helps students gain insight into why we read and write (Guthrie et al., 2006).

An example of an authentic, knowledge-building literacy activity is for fourth graders to gather data on how water is used in their school and reading experts' recommendations on water conservation practices. Findings from gathering of data and reading can be used by students to make recommendations for water conservation practices in their schools and communities. In addition to building knowledge and motivation, purposeful activities such as these provide opportunities for extensive reading of diverse genres of text. In the water example, students might read science articles and fiction and nonfiction trade texts. They might read and create charts about water use. They might engage in interviews with school administrators and local experts, taking notes and summarizing what they learn. They might create a slide presentation to share key points with members of their communities.

While class projects can be powerful opportunities to develop knowledge and motivation for reading, students should also be given opportunities to pursue their own interests through self-selected reading and research. When students are given choices of sections of a book or different articles on a topic, they have real reasons to communicate to their peers what they have learned—and perhaps to inspire others' interest in the topic.

Hope for the Future

We recognize that building knowledge using current instructional materials requires substantial effort and ingenuity on the part of teachers. We hope that the emphasis on informational text and knowledge building in research and standards will bring better resources in the future. We believe that a commitment to knowledge-building is especially essential in light of the diversity of our classrooms. For students who come from marginalized communities and for those who speak first languages other than English, ELA experiences that place a premium on students' existing knowledge and on ensuring that all students develop rich, relevant, and deep bodies of knowledge are the means whereby they will have gain the literacies required for the 21st century.

In the meantime, even small steps toward knowledge building ELA instruction are an important step toward supporting students' long-term engagement with school learning. The goal, after all, of ELA instruction is not accurate word reading. The goal is understanding and learning from text…and, ideally, developing a love of reading…*and this requires knowledge of the world.*

Take Action!
1. Extend the time students spend reading by making accessible, content-rich books available to every student, allotting time each day for independent reading, and implementing routines for keeping track of reading.
2. Use read alouds to engage students with thematically and conceptually-sophisticated texts and teach students to form connections within texts and to prior knowledge.
3. Read your grade-level content standards with an eye to big ideas and concepts that might lend themselves to class-wide projects.

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