Crafting questions that address comprehension strategies in content reading

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Preservice and inservice teachers devise questions that encourage students to read content texts strategically.

Teachers of core subjects at all grade levels in the United States are today expected to play a larger role in supporting students’ reading of course materials than has historically been the case. As a result, math, science, and social studies educators, who understandably are wedded to their specialty areas and not necessarily devotees of the English language arts, must now grapple with learning how to cultivate students’ comprehension of subject-related texts. According to Tovani (2004), it is precisely because they are experts in their fields that content area teachers are best equipped to show students how to read the texts unique to their subjects. This means they must first become familiar with the rudiments of comprehension—“the active mental work kids must do” (Daniels & Zemelman, 2004, p. 99) to make sense of what they are reading—and then guide students in using these strategies.

Trabasso and Bouchard (2002) described comprehension strategies as “specific, learned procedures that foster active, competent, self-regulated, and intentional reading” (p. 177). Lenski, Wham, and Johns (2003) added that “The judicious, flexible use of strategies when reading and writing is a prime characteristic of expert readers and writers and should be an instructional goal for every teacher” (p. 4). Some who study teachers’ instructional behaviors, however, have observed that content teachers, even when acquainted through university course work with these essential strategies, do not transfer that knowledge to their students (Jackson & Davis, 2000; Nouri & Lenski, 1998). One of Nouri and Lenski’s recommendations, therefore, was that university courses in content reading should include more instructor modeling of reading techniques. In this article I briefly describe the nature of teacher questions, the content teacher’s role in using them to facilitate students’ reading comprehension, and my own attempt to help preservice and inservice teachers formulate appropriate questions. I then offer suggestions for making strategic questions a part of the content teacher’s instructional repertoire.

Content teachers’ role

According to Sizer (1984) and Wiggins and McTighe (1998), the best teachers act as coaches. They explain, guide, demonstrate, cajole, quiz, and more—all with an eye toward helping students grasp academic content. Nowhere is this more important than in the subject areas of math, science, and social studies, in which the conceptual load is substantial and the associated vocabulary in course texts is technical and often
intimidating. Whether the material be traditional textbooks or relevant publications such as newspapers, magazines, essays, and trade books that are widely available for augmenting content studies, a teacher’s ability to skillfully support students’ comprehension of course-related reading is fundamental to successful learning (Block, 2004; National Institute of Child Health and Human Development, 2000; Vacca & Vacca, 2005).

The customary classroom approach to fostering students’ comprehension of written texts is the read-question-respond model (Alvermann, Swafford, & Montero, 2004; Durkin, 1978/1979). In whole-group formats, teachers typically question students about content after an assigned chapter or passage. Students respond—or at least a few do—and a brief discussion sometimes ensues. Teachers occasionally use a similar approach with small groups of students. Whether generated in large- or small-group settings, however, teachers’ questions about reading material have at their core the underlying intent to ascertain and increase students’ levels of comprehension.

How questions differ

Questioning students about what they have taken from a reading assignment is undeniably important. At the heart of comprehension, however, is how students think their way through a text while reading, and the quality of that thinking depends, in part, on the type of questions teachers ask (Alvermann et al., 2004; Hoyt, 2002; Miller, 2002, Vacca & Vacca, 2005). The truth is that not all questions are created equal. Teachers have innumerable options as to when and how they query students. They can ask questions before, while, or after students read. They can choose from open and closed questions, as well as literal, inferential, or applied questions. In addition, McKenzie (1997) identified 18 varieties of questions, including what he called essential, probing, clarification, hypothetical, and strategic questions. Qualitatively different from the other question types, strategic questions are probably less familiar to teachers and students. According to McKenzie, strategic questions

focus on ways to make meaning...they help us while passing through unfamiliar territory by prompting us to think deliberately: What do I do next? How can I best approach this next step, this next challenge, this next frustration? What thinking tool is most apt to help me here? (p. 4)

Thus, strategic questions foster metacognition, or awareness of our own thinking (Baker & Brown, 1984). Strategic questions not only can be asked about any topic or process but also are especially useful in fostering reading comprehension.

Applied in the context of content reading, they focus more on how to comprehend challenging material than on what has been comprehended; although, of course, one generally leads to the other (Duke, 2004). McLaughlin and Allen (2002) suggested that “the focus of instruction should not be on the print, but on how readers interact with the print” (p. 2).

Ultimately, there is a significant difference between asking questions that ascertain or assess students’ comprehension of text and questions that address the foundation of good comprehension: strategic reading. Coaching students to approach subject-area reading with tactical thinking requires that teachers model their own meaning-making processes and then prompt students to do likewise, using strategic questions. Drawing students’ attention to their reading processes and helping them make the most of the reading experience is surely a goal content teachers can embrace.

Crafting strategic questions

In my undergraduate and graduate content literacy courses, I familiarize elementary and middle-grade teachers with instructional strategies that will enable their students to better extract meaning from written texts. We begin by focusing on comprehension strategies that two decades of research have shown facilitate metacognition. Daniels and Zemelman (2004) referred to them
as “tools for thinking” (p. 99): activating background knowledge, previewing material, predicting, making connections, questioning the text, inferring, visualizing, clarifying, self-monitoring, summarizing, and evaluating. Studies show that these are the essential cognitive gear that generates active and proficient comprehension (Alvermann et al., 2004; Duke & Pearson, 2002; Lenski et al., 2003; Pressley, 2000). We talk about the importance of strategic reading, and my students observe these strategies in action as I explicitly verbalize my own thinking processes while reading informational text aloud. Afterward, I encourage my students to do likewise, using authentic content reading materials. According to Wilhelm et al. (2001), such demonstrations enable teachers to lend their cognitive expertise to students. In addition, we discuss the importance of teacher questions that address a variety of thinking levels—literal, inferential, and applied—and my students design lessons and reading guides that incorporate their use.

After several weeks of instruction, I am pleased to see my students beginning to exhibit competence in modeling their own reading—thinking processes, as well as in writing lesson plans that incorporate specific literacy strategies before, during, and after reading. Nevertheless, I have found that, despite understanding the mental work required for proficient comprehension, content teachers struggle when challenged to craft questions that prod their students to do that work. The consistent results of an in-class task I assign each semester make this strikingly clear. To begin, I distribute to each student a copy of a brief written text, usually an article from a news magazine, along with several small sticky notes. Then I issue instructions similar to these:

Read the following article as though you were planning to use it in a classroom lesson. Think of three or four questions you could ask that would encourage your students to read strategically. [Note the stress on the word strategically.] Write one per sticky note, affixing each at a point in the text where it might help a struggling reader better comprehend the material.

This technique, called “embedded questions” and recommended by Weir (1998), offers extra support for less able readers who need practice in thinking their way through a reading task. According to Alvermann et al. (2004), embedding questions in a written text helps struggling readers “internalize the dialogue associated with monitoring their comprehension of content area texts” (p. 237). It enables them “to think about what it is they should be doing during reading and, ultimately, to self-assess whether or not they are doing it” (p. 237). In essence, embedding questions in a text helps struggling readers “discover what good readers already know: meaning is made, not found” (p. 153). My goal in introducing this activity is to encourage content teachers to bridge what they know about metacognition and good questioning techniques. I want them to think about what they should be doing when asking comprehension questions and to self-assess whether they are or not. Once they have mastered this ability, I reason, they should be able to thoughtfully guide students through a reading assignment using appropriate questions in either oral or written form.

For the past four semesters, I have used an article from Scholastic News (Scholastic, 2003) as the text for this exercise. It describes a recent surge of interest in unconventional pets and cautions readers about the dangers involved in ownership. After reading the article, my pre- and inservice teachers diligently begin drafting questions on sticky notes as I circulate, monitoring their work. Amongst a few well-framed questions (the majority encouraging prediction), I observe a proliferation of questions such as those in the following list. (Relevant annotations are included.)

- Why was the purchase of prairie dogs banned? (Literal—it is explained in the text.)
- What does quarantine mean? (Literal—the word is defined in the text.)
- How can diseases by exotic animals be better controlled? (Literal—it is explained in the article.)
- Why do you think people want exotic pets? (Inferential—it is implied, although not explicitly stated in the article.)
- Do you think there should be laws prohibiting the sale of exotic animals? (Applied—the reader must integrate text information with evaluative thinking to construct a response.)

When students share their questions with the whole group, I ask them to justify how their queries encourage strategic reading. Alluding to our earlier studies, they confidently explain that many of the questions are “open-ended” and designed to foster thinking at the literal, inferential, and critical or applied levels. I affirm that, indeed, they have crafted solid questions for assessing students’ comprehension and generating discussion during or after reading. Then I ask them how their questions support students who have difficulty comprehending as they read. The class members are usually quiet as they consider my question, looks of discomfort evident on their faces. After a moment, I remind them to think of the cognitive processes required for good comprehension—for strategic reading. Eventually, someone who has written a strategy-based question will hesitantly suggest an alternative. The ensuing dialogue, captured on video in one class of preservice middle-grade teachers, generally goes like this:

“How about if right after the students read the title I ask, ‘Do you know anyone who has an exotic pet?’”

A murmur arises among the other class members, and they begin nodding.

“You think that’s a better question? Why?” I ask.

“Because you are encouraging the students to activate background knowledge and make connections with the material,” someone offers.

“Yes, it gets students thinking about the material before they actually start reading,” another teacher agrees.

Someone else suggests asking students to predict what they think the article is going to be about, and we discuss, as we have many times during the semester, the role prediction plays in good comprehension.

Recalling our frequent discussions about using the features of written text as tools for comprehension, another student mentally composes a relevant question and suggests that a teacher might say, “Judging by this photo and caption, what do you think this article will be about?”

Enthusing that they are on the right track, I continue the dialogue and remind these educators to think about the strategies they would want their students to use while reading the remainder of the article. They rapidly begin naming the thinking tools we’ve explored throughout the semester. Capitalizing on this momentum, I distribute sticky notes of a different color and instruct, “Use these new sticky notes to write a second group of questions that address the comprehension strategies you know students should be using as they read.”

My students immediately begin composing a revised group of questions and within minutes are able to offer several excellent examples, identifying the type of thinking each question stimulates.

- Have you ever heard anyone use the phrase pet peeve? What do you think it might mean? (activating background knowledge, connecting, using context, inferring)
- Where on the first page can you find the definition of exotic? How does this definition apply to the topic? [A small text box in a bottom margin of the article defines exotic as an adjective meaning “strange and fascinating, or from another country” (Scholastic, 2003, p. 4).] (inferring, using context and text features)
- As you read, list the exotic pets that are mentioned in the text and shown in photos [prairie dogs, Gambian rats, sugar gliders, Capuchin monkeys]. What do they have in common? (inferring, making connections)
• Why do you think someone would want a prairie dog instead of a dog or cat for a pet? (inferring)
• What do you think a prairie dog’s natural habitat looks like? (visualizing)
• What other diseases does monkeypox remind you of? (activating background knowledge, making connections, inferring)
• Based on what you have read so far, do you think all prairie dogs carry monkeypox? (inferring)
• Do you agree with exotic pet fans that officials are giving these animals “a bad rap”? (evaluating)

As we conclude and reflect on this exercise, my students marvel at their initial tendency to focus on questions that serve primarily to assess comprehension. There is considerable buzz in the classroom as they share their dismay at how easily they revert to asking “typical” questions—the kind they have become accustomed to answering in their own schooling. Despite intellectually understanding the aspects of cognition that promote good comprehension, they appear to revert to ingrained questioning models—at least initially—that largely ignore the cognitive components of comprehension.

I regularly collect and scrutinize the sticky-note questions composed by the preservice and practicing teachers who participate in the embedded questions activity. Sorting through the dozens written prior to and after my intervening comments, I analyze them for the nature of thinking they require. Table 1 offers a breakdown of five representative questions generated by the preservice teachers quoted earlier, their first and second attempts at crafting strategic questions. Note that although the first examples include questions at each of the important levels of thinking (literal, inferential, and critical), they are the kind of questions that are most often asked after students read and, for the most part, do not offer the during-reading cognitive support many students require. Their design encourages the recitation model of question and response described earlier: Students are expected to supply answers to queries about their understanding of the reading material, but there are few questions that trigger the mental processes that lead to comprehension.

**Insights and benefits**

I have gained some important insights through watching my students attempt to draft strategic questions. First, teacher educators should not presume that teachers, whether they are preservice or inservice, automatically make the link between comprehension strategies and the instructional questions that inspire their use. Second, instructors of content reading courses need to clearly define strategic questions, helping teachers distinguish between these and other question types, as well as understand the crucial role they play in reading comprehension. Finally, content teachers need explicit modeling and practice—not just discussion—regarding the differences between assessing and addressing comprehension.

Lacking this instruction, teachers are often confounded by this distinction and may mistakenly feel that their assessment-oriented questions are sufficient to help struggling comprehenders. Repeated observation of instructors thinking their way through question design and implementation serves as a blueprint that content teachers can comfortably emulate. Instructors might ask, for example, “How would you phrase a question that encourages your students to visualize the animal’s habitat as they are reading?” Allowing teachers time to ponder, compose, and discuss strategic questions using authentic texts illuminates both the processes and value of this critical teacher skill. Moreover, peer-teaching lessons in which pre- and inservice teachers practice asking these questions clarifies how students’ thinking may be guided during reading.

For their part, teachers can thoughtfully consider their approach to questioning students about
subject-matter reading. Are they expecting students to complete all reading assignments independently, with little or no guidance? Do they primarily ask questions about those assignments with just one purpose in mind—assessing students’ comprehension? Are they aware of their own “expert” thinking when they read, and do they foresee questions they might ask students that elicit similar kinds of cognition? As Wilhelm et al. (2001) observed, those of us who teach need to “disrupt our own reading in some way to gain awareness of how we proceed as we read or make

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<th>Preservice teachers’ initial attempts at crafting strategic questions</th>
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<td>Attempt 1</td>
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<td><strong>Preservice teachers’ questions</strong></td>
<td>Type, purpose, and appropriate timing of query</td>
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<tr>
<td>Why was the purchase of prairie dogs banned?</td>
<td>Type: literal Purpose: assess comprehension When: during or after reading</td>
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<tr>
<td>Why do you think people want exotic pets?</td>
<td>Type: inferential, critical Purpose: assess comprehension and ability to infer/generate When: during or after reading</td>
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<td>What does <em>quarantine</em> mean?</td>
<td>Type: literal Purpose: assess use of context When: during or after reading</td>
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<tr>
<td>How can diseases spread by exotic animals be better controlled?</td>
<td>Type: literal Purpose: assess literal comprehension When: during or after reading</td>
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<tr>
<td>Do you think there should be laws prohibiting the sale of exotic animals?</td>
<td>Type: applied Purpose: assess ability to apply text information When: after reading</td>
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meaning with text. These disruptions in turn can help us think of how to help students” (p. 69). In short, teachers need to do more than assign; they need to guide students’ understanding with questions designed to help them think more effectively.

I can attest to the benefits that occur when current and future teachers understand through explicit instruction and practice how to craft questions that prompt students to read strategically. Appropriate, high-quality questions begin appearing in their written plans and, what’s more important, in the lessons I observe them teach in their classrooms. It is immensely gratifying to hear a science teacher ask a fifth grader who is reading about the properties of solutions, “What do you notice about the spellings of solution, soluble, and dissolve, and what can you infer about their meanings?” We all—teacher, student, and professor—smile with satisfaction when the student answers correctly, aware that the content teacher is helping the entire class learn how to learn.

REFERENCES