Disciplinary Literacy Assessment

A Neglected Responsibility

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Assessment is a "four-letter word" these days. Classroom teachers we work with often lament instructional time sacrificed to standardized test preparation. Summative assessments *of* learning have overshadowed formative assessment *for* learning. Assessment of discipline-appropriate literacy is an all but ignored topic in the professional literature.

Recently, we conducted content analysis of the National Reading Conference/Literacy Research Association *Yearbooks* from 2000 through 2012 (Gillis et al., 2013). We examined this time period to explore the influence of the International Reading Association's (IRA) Adolescent Literacy Position Statement (Moore, Bean, Birdyshaw, & Rycik, 1999) on adolescent literacy research. One surprising finding that emerged from the content analysis was the dearth of research published on assessment of any kind. Only one *Yearbook* article in a little over the past decade dealt directly with adolescent literacy assessment. In an extension of this project, we also examined the *Journal of Adolescent & Adult Literacy* (JAAL), *Reading Research Quarterly* (RRQ), and the *Journal of Literacy Research* (JLR) for articles on assessment during the same time

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frame. During the 12-year period, we found 23 articles that were related to assessment. In JLR and RRQ, seven articles explored assessment issues in general as well as assessment of fluency, vocabulary, and the effects of high stakes assessment on literacy instruction. Sixteen assessment related articles published in JAAL included assessment of motivation, comprehension, vocabulary, and the use of portfolio assessment, with one issue of JAAL in 2007 focused on portfolio assessment. Our review indicated that assessment of disciplinary literacy is a neglected topic in our field.

One formative assessment tool that we have used in content classrooms is the Strategic Content Literacy Assessment (Alvermann, Gillis, & Phelps, 2013). Based on Brownlie, Feniak, and Schnellert's (2006) Standard Reading Assessment, the Strategic Content Literacy Assessment (SCLA) is a teacher-created assessment of students' abilities to read and comprehend discipline-appropriate text. The assessment measures students' abilities to connect what they read to prior knowledge, summarize what they read, draw inferences, make intertextual connections, comprehend vocabulary terms that are explicitly and implicitly defined in the text, and think metacognitively. Because disciplines vary in the types of text that are read, SCLAs vary according to the content area being assessed. For example, an English/language arts SCLA might be based on narrative text whereas social studies and science SCLAs are typically based on expository text. SCLAs in mathematics are usually based on problems to solve and require readers to articulate their mathematical thinking as they solve given problems. Questions on a SCLA depend on the discipline and on the kinds of cognitive processes a teacher wishes to assess. In the following sections, we describe how to construct and administer an SCLA, with adaptations for different content areas, then describe how to analyze the results.

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Constructing and Administering a Strategic Content Literacy Assessment

Construction and administration of a Strategic Content Literacy Assessment varies across the disciplines. In this discussion, we first address English, science, and social studies, then turn to mathematics.

English, Science, and Social Studies

To create an SCLA in English, science, or social studies, first select a relatively self-contained piece of text that does not require an excessive amount of prior knowledge. The text should be easily read in a reasonable time frame, approximately 20–30 minutes, so that the assessment can be accomplished in one class period. If selecting fictional text in English/language arts, be sure that the text you select allows you to ask the kinds of questions important to comprehension of fiction. Part of the opening section of a chapter from a science or social studies text is appropriate, particularly if the teacher will be relying on the textbook throughout the semester or year. For science, make sure the chosen text excerpt has diagrams related to the prose in the text. The Internet is another good source of appropriate text, particularly if you regularly use text drawn from sources other than the textbook. In social studies, choose primary sources carefully; archaic vocabulary and syntax can be difficult for students to comprehend without appropriate scaffolding.

If primary sources are used, consider highlighting sections of the documents for students to read and inserting definitions parenthetically for archaic terms and phrases, to scaffold students' reading. When using primary documents, an American history teacher might select quotes from both the loyalist and patriot sides of an event, for example the American Revolution. The loyalist perspective could be illustrated with information about Thomas Hutchinson, highlighting the most important information and inserting definitions of archaic terms or explanatory notes in brackets as in this quote from one of his letters (Brady, 2004): "It is better to submit to some abridgement [loss] of our rights [as Americans], than to break off our connection with our protector, England." The patriot perspective is captured in Patrick Henry's speech in which he declared, "Give me liberty or give me death." Because Henry's speech (Logan, 2001) is long, and only segments need be read, we suggest highlighting the first few lines of pertinent paragraphs, and the quote in the closing paragraph with parenthetical definitions for archaic terms, then directing students to read only the highlighted text.

The selected reading should be representative of text in the target discipline and therefore representative of the sorts of text that students will be required to read. See Table 1 for text selection suggestions in English, science, and social studies.

Next, generate questions that require students to connect to prior knowledge, summarize text, draw inferences, make connections within the text, identify and explain vocabulary, and think metacognitively. Use your content standards as a guide to the processes to assess. Sample generic questions used in English/language arts as well as adaptations for science and social studies are illustrated in Table 1. Most teachers we have worked with select four or five of the six cognitive processes to assess, and provide students with a copy of the text and a copy of the assessment that allows room for answers.

Mathematics

To construct an SCLA for mathematics, select two to three word problems that demand different knowledge and operations. Ask students to identify the operations needed to solve the problem. Next, ask students to identify the words in the problem that indicate an operation. Some teachers also ask students to provide the symbol associated with the identified operations. Math teachers may wish to provide several mathematical expressions and ask students to select the one that summarizes the problem, but some teachers omit this type of question. Finally, ask students to solve the problem using a two-column thinking chart in which they solve the problem on one side, and provide an explanation for their mathematical reasoning on the other side. See Figure 1 for a sample problem and question pattern in sixth-grade middle school math. Math teachers we have worked with generally use three to four problems and ask similar questions to those posed in Figure 1 for each problem. Unlike an SCLA in English, science, or social studies, an SCLA in math can be administered on multiple days, one problem each day.

Analyzing Strategic Content Literacy Assessments

An SCLA provides the opportunity to assess oral reading fluency in addition to discipline-appropriate cognitive processes. Assessing oral reading fluency takes only a few minutes with each student, and provides a teacher

TABLE 1 Adaptations of SCLA for Discipline-Appropriate Literacy Processes in English, Science, and Social Studies

SCLA Elements	Disciplines		
	General Guidelines [English/LA]	**Science**	**Social Studies**
Text selection			
Text	Narrative, fictional text that is a complete story or a non-fiction text [perhaps one that would provide background for an upcoming short story or novel]. In general, choose text that is relatively self-contained and that does not require excessive amounts of prior knowledge.	Use an excerpt from the textbook/internet with diagrams related to the key ideas, or provide a description of lab procedures with data (modify the SCLA questions appropriately as indicated below).	Use an excerpt from the textbook/internet that is relatively self-contained or choose two to three short primary documents, provide quotes from primary documents, or highlight segments from primary documents and direct students to read only the highlighted text.
Cognitive Processes			
Questions addressing prior knowledge	What did you know before you read the text that relates to the information in the text? How did you use this knowledge to understand the text?	What did you know before you read that relates to the information in the text or lab procedures and data? How did you use this knowledge to understand the readings?	*Contextualization:* What previous or concurrent events might be related to these documents?
Questions asking students to summarize text	If using fictional text, consider asking students to identify the theme of the story. For non-fiction, ask students to show the most important ideas in the text in any way that makes sense to them [diagram, summary, map].	If using a textbook/internet excerpt, ask students to indicate the most important ideas in the reading in any way that makes sense [diagram, summary, map]. *Drawing conclusions:* [When using a description of lab procedures with data]. What conclusions can you draw from the lab report?	*Close reading*: What are the key ideas from these documents?
Questions requiring students to draw inferences	What is something you think is true based on the text, but that is not said in the text? Why do you think this is true?	[When using a textbook/internet excerpt] What is something you think is true based on the text, but that is not said in the text? Why do you think this is true? [When using a description of lab procedures with data] What pattern(s) do you observe or see in the data? What inferences can you draw from this pattern(s)?	*Sourcing*: When was this document written? Who wrote it? How does this influence your reading? *Close reading:* How does the language in these documents influence your reading? Is there evidence of bias? If so, what words indicate bias and how do you know?
Questions requiring students to make connections	Identify two ideas from the text (X and Y) and ask: Two ideas in the text were X and Y. How are these related? In fiction, you might ask about connections between the setting, characters, and/or events in the story.	[When using a textbook/internet excerpt with a diagram] How does the diagram relate to the text you read? [When using lab procedures and data] Ask students to make connections between the data and their inferences.	*Corroboration*: What are the similarities and differences between [among] these documents?
Questions that assess students' knowledge of vocabulary	Select about three words – one that you believe students should know [prior knowledge]; one that is explicitly defined in the text; and one that is implicitly defined in the text. Identify the terms and ask students to tell what the words mean and how they know this.	Select terms in the text/internet excerpt or lab procedures and data that are crucial for understanding the readings. Be sure to include terms that are implicitly and explicitly defined in the text.	Choose terms that are crucial for understanding the documents. You may wish to provide the meaning of archaic terms and phrases parenthetically, and ask questions related to the use of these terms or phrases.

TABLE 1 Continued

SCLA Elements	Disciplines		
	General Guidelines [English/LA]	Science	Social Studies
Questions to assess metacognitive processes	Was this task easy or hard? What made it easy or hard? What did you do to help yourself understand? Note: it is best to ask these questions separately.		

FIGURE 1 Example of an SCLA in Middle School Mathematics

Problem I: What is the difference between the sum of 6 and 8 and the product of 6 and 8?

1. What operation(s) are needed to solve this problem? List any operation(s) in the order they must be performed.

2. Circle the word(s) in the above problem that indicate an operation and put the symbol representing that operation above the circled word.

3. Solve the problem in the T-chart below.

Show your work below:	Explanation of your math reasoning

with specific information about how well the student can read aloud. As students complete the assessment, a teacher listens to individual students' oral reading, directing students to read two to three sentences of the student's choice. Using an assessment system of your choosing, note each student's fluency rating. A sample fluency rating system is provided in Table 2.

Creating a scoring guide to use as you evaluate each student's response serves several purposes: it can be based on the standards for your grade and/or subject and it can make scoring more consistent and efficient. A sample scoring guide is provided in Table 3. Note that the evaluation is plus (+), check (✔), and minus (-) rather than numbers. An SCLA is a formative evaluation of students' abilities to read and understand discipline-appropriate text. This assessment informs instruction, but should not be used in grade calculations.

Once student responses are evaluated, it is helpful to create a summary of the responses. Such an overview can be useful in planning instruction. In the example provided in Table 4, you can see that students in this class are able to access their prior knowledge, but have difficulty with summarizing, inferencing, and thinking metacognitively. In such a class, increasing support to help students differentiate important from unimportant information, draw inferences, and reflect on their thinking would improve students' learning and literacy.

One of the hallmarks of good assessment is that the information obtained is useful to both teachers and students (Alvermann et al., 2013). Results of an SCLA can be shared with students during conferences to leverage strengths and bolster areas in need of growth. Such conversations can help students set academic goals and take ownership of their own learning.

TABLE 2 Criteria for Rating Oral Reading Fluency

Oral Reading Element	–	✔	+
Pronunciation	Stumbles over many words; mispronounces many	Mispronounces a few words	Accurate pronunciation
Expression	Expression is lacking—monotone is used for reading; phrasing is inappropriate	Expression is not appropriate throughout—phrasing is mostly appropriate	Expressive reading—phrasing is appropriate
Pace	Slow, halting, interferes with smooth reading of text	Too fast or too slow	Steady and appropriate

TABLE 3 Sample Scoring Guide for a Strategic Content Literacy Assessment

Process	-	!!	+
Connection to Prior Knowledge	Student did not make a connection to prior knowledge	Student made a connection to prior knowledge but did not provide evidence for prior knowledge	Student made a connection to prior knowledge and provided evidence for their prior knowledge
Summarize	Student did not summarize the main ideas accurately OR did not differentiate between important and unimportant information	Student summarized some of the main ideas accurately but did not include relevant details OR included unimportant details and main ideas	Student summarized the main ideas accurately, and included relevant details
Inference	Student did not make an inference or student made an unrealistic inference and did not support it	Student made a realistic inference based on the text but did not support it or Student made an unrealistic inference and supported it	Student made a realistic inference based on the text and supported it with text information and/or prior knowledge that was relevant and accurate
Vocabulary	Student did not accurately define vocabulary	Student accurately defined some vocabulary, but had difficulty with vocabulary that was not explicitly defined in the text	Student accurately defined explicit and implicit vocabulary
Metacognition	Student was not able to explain their method of cognition/ understanding	Student was somewhat able to explain their method of cognition/ understanding, but did not identify specific strategies used	Student was able to clearly explain their method of cognition/ understanding, and identified specific strategies used

TABLE 4 Example of Scoring Analysis for a Strategic Content Literacy Assessment

Process	–	!!	+
Connect to prior knowledge	0	15 (54%)	13 (46%)
Summarize	12 (43%)	10 (36%)	6 (21%)
Draw Inferences	12 (43%)	12 (43%)	4 (14%)
Vocabulary	8 (29%)	14 (50%)	6 (21%)
Metacognition	12 (43%)	14 (50%)	2 (7%)

Conclusion

We have worked with teachers who use SCLAs in the beginning of the year to determine which cognitive processes to emphasize as they plan for disciplinary literacy integration. Some teachers use SCLAs at several points in the academic year to document student growth in disciplinary literacy. If secondary teachers are serious about improving students' disciplinary literacy and learning, they need a way to formatively assess disciplinary literacy processes. The Strategic Content Literacy Assessment allows teachers to target discipline-appropriate cognitive processes in order to design instruction that addresses students' needs, and to document the growth of targeted cognitive processes.

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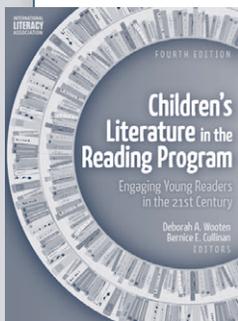
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