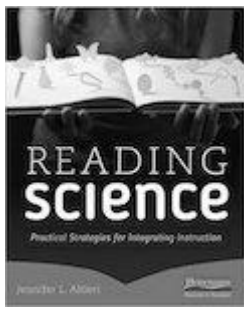


Reading Science: Practical Strategies for Integrating Instruction

Reading Science: Practical Strategies for Integrating Instruction			
Author:	Jennifer L. Altieri (2016)		
Publisher:	Portsmouth, NH: Heinemann		
Pages	ISBN-13	Price	
xiv + 130 pages	978-0-325-06258-7 (paper)	\$24.37 USD	

When I think of science, I think of inquiry-based instruction, such as *doing* investigations and *writing* lab reports. This tendency is not surprising considering that I have taught science at the secondary level for a decade now. In *Reading Science*, Jennifer Altieri brings into focus this content area through literacy while recognizing science as lexically dense. Thus, science demands specific skills necessary to understand the content and assess its accuracy. This is a connection that I have long recognized but have not conceptually applied. “Whether you are just beginning your teaching journey or have many years of teaching experience,” Altieri’s goal for her book is “to serve as the foundation upon which you can create important connections between science and literacy” (p. xi). Elementary school and science teachers will find a useful resource to contextualize the English Language Arts Common Core Standards (ELA CCSS) and the Next Generation Science Standards (NGSS) within the teaching of science in the United States.

A first read echoes that “every teacher is a teacher of reading”; however, in reading this book more closely, I realized that this is not an accurate expectation. Instead, Altieri suggests that the disciplinary specificity of science prompts us to recognize that all learning is based in language. Throughout the pages, multiple ideas are offered for teachers to provide opportunities in using language as part of science instruction to significantly improve students’ achievement. While acknowledging that reading strategies can become more important than the content itself, Altieri contends that scientific literacy skills model the work of scientists in communicating and understanding the nature of science. Thus, Altieri offers various “think about it” and

“take action” short sections prompting us to reflect on our teaching methods and how to apply new concepts.

Book Organization

Reading Science is organized into five chapters. Chapter one describes the connection between science and literacy, identifying eight challenges and how they are really opportunities for integrating both areas. While Altieri recognizes the importance of hands-on activities, she points out that students need to not only be able to assess a scientific text, but also identify with or contest the author’s biases. This presents the opportunity for students to become critical consumers of information. There is very little attention dedicated to science in elementary schools across the United States (Blank, 2012); considering the scientific background of a student is a foundational opportunity to build upon. Today, our increasingly culturally diverse population of students presents a challenge. Having students express and develop their knowledge through multiple ways is difficult. Some opportunities to consider are students’ prior reading experiences, motivation through student-centered instruction, science textbooks, vocabulary demands, and the use of images, graphics, and technology tools. These opportunities are variously explained throughout the book via the common thread of literacy.

Chapter two considers the science textbook, but it makes a case for including other forms of texts such as trade books. These trade books are classified by format as picture books and chapter books and by content as *faction*, texts blending facts and fiction, poetry, and informational texts. The strength of this chapter, however, is in the description on how to select texts for use in the classroom and in the discussion of new literacies. The evaluation for texts provides a checklist consisting of four areas of focus: science content, images, writing, informational text features, and overall design. A similar checklist is offered when evaluating new literacies such as blogs, articles on websites, and videos.

Chapter three focuses on vocabulary, where specific principles used to help vocabulary instruction are explained. These principles are morphemic knowledge, word relationships, creating and maintaining scientific interest, and getting students to read widely. Altieri proposes several strategies to acquire scientific vocabulary; one of them involves using morphemes (e.g., *osis*, *bio*, *meter*, and *hydro*, among others. Inspired by comedian Rich Hall, having students create singlets consists of combining up to five morphemes and assigning it a definition. The meaning is a combination of each of the morphemes. Another strategy list-group-label asks students to brainstorm roughly two dozen words related to a scientific topic. The teacher writes each word on the whiteboard, and then students work in small groups to classify word clusters into categories. There are many other vocabulary strategies; however, none makes reference to cognates when there are over 20,000 Spanish-English cognates (Montelongo, 2002). For English language learners (ELLs), particularly Spanish speaking students, drawing from cognates is an effective teaching strategy.

Chapter four elaborates on Altieri’s notion of text *flexibility* as a way to strengthen text comprehension and decipher text features. Reading informational text, particularly

scientific text, demands a shift of purpose from that of reading narrative and fictional texts to which most students are accustomed. In reading science content, the purpose is to gain an understanding and relating the information to the real world. Text flexibility refers to the ability to vary the approach to texts depending on the purpose for reading. Altieri's notion assists reading comprehension through five principles: understanding text features, questioning author's purpose, focusing on specific content, engaging with multiple texts on a scientific topic, and learning to support opinions with textual evidence. Several strategies are offered addressing each principle. For instance, in addressing the content, Altieri includes text-dependent questions as promoted by achieve.org. Among the types of text-dependent questions, there is *vocabulary* and *text structure*, to focus on tier II terms, but text structure is confused with text features. Understanding features such as the table of contents, index, headings, and captions, among others, can make scientific texts more accessible. However, text structure understood as types of informational text structure such as comparison, cause and effect, problem-solution, is not addressed in *Reading Science*.

Chapter five addresses images, their types, and their role in science literacy. This, I believe, is the most important chapter. Images have often been underestimated as having a distracting effect by portraying "seductive details" (Harp & Mayer, 1998). However, Altieri acknowledges the challenges of using images but asserts that diagrams, tables, charts, and graphs are an integral part of scientific literacy and must be addressed to enhance students' comprehension. Three principles guide this chapter, including understanding the purpose of images, recognizing their types, and comprehending information in them. Comprehension strategies used for the written word can be identified to see whether they work with images. For instance, *reading is rarely quick and easy*, often difficult text requires re-reading. Similarly, interpreting images requires time to view and review them and assessing how text relates to the image. Another strategy is that of "think-aloud," which assists students in metacognitively processing information. As others are discussed, readers can come to fully appreciate Altieri's effort in helping them to view images through critical eyes.

Conclusion

Even though the book is missing an important text feature, the index, the inclusion of appendices that include worksheets corresponding to strategies discussed throughout the book compensates for that absence. Although there is an abundance of content-area and science literacy books, Altieri's *Reading Science* proves to be a valuable resource for elementary and science teachers. The strategies or activities, as Altieri uses both terms interchangeably, are grounded in best practices and are easy to implement. What is important to appreciate is that not all activities have to be applied; a few can be adopted by the elementary school or science department and implemented consistently over time.

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