

Chapter 48

Integrating Disciplinary Literacy Practices in One- to-One Classrooms

Emily L. Freeman

*University of North Carolina at Chapel Hill,
USA*

Dalila Dragnic-Cindric

*University of North Carolina at Chapel Hill,
USA*

Alexandra J. Reyes

*University of North Carolina at Chapel Hill,
USA*

Janice L. Anderson

*University of North Carolina at Chapel Hill,
USA*

ABSTRACT

This chapter examines the use of disciplinary literacy in elementary and middle grade science classrooms that participated in a one-to-one iPad initiative. Results of teacher instruction in science disciplinary literacy practices in a one-to-one iPad technology integration, examples of collaborations, and observational data are shared. The teachers in this study demonstrated an overreliance on basic and intermediate literacy practices, with a few using emergent disciplinary practices in their science instruction. We look to extend the STEM and technology integration conversation to include disciplinary literacy practices. We conclude with a call for stronger science disciplinary literacy instruction in teacher education programs, as well as greater collaboration among literacy teachers, science teachers, and researchers. We also recommend developing coaching programs that work with teachers to increase the rigor of their science content, implement intermediate and disciplinary literacy practices, and utilize technology in a transformational manner.

INTRODUCTION

This chapter examines the ways that disciplinary literacy instruction did or did not occur in elementary and middle grades classrooms that participated in a one-to-one iPad initiative. Literacy instruction can and should be embedded across disciplines, but is often relegated to English Language Arts classrooms or lessons (Appleman, 2010). At a basic level, reading can be understood as a transaction between the

DOI: 10.4018/978-1-5225-3417-4.ch048

reader and the text in order to take or use information. Unfortunately, this very efferent view of reading tends to dominate in schools that are considered “under-achieving” and leads to a direct link between reading and testing. Because of the current emphasis on testing, literacy instruction tends to be isolated from other content area instruction (Appleman, 2010). Research has shown that explicit literacy instruction in the disciplines, including science, leads to deeper understandings of the content, interdisciplinary connections, and promotes reading comprehension (e.g., Akins & Akerson, 2002; Bangert-Drowns, Hurley, & Wilkinson, 2004; Hackney & Newman, 2013).

The Common Core State Standards (CCSS) call on teachers to use technology in literacy instruction for a variety of purposes; for example, to integrate technology to publish a text and collaborate and interact with others (CCSS.ELA-LITERACY.CCRA.W.6), gather information from digital sources (CCSS.ELA-LITERACY.CCRA.W.8), and determine the meaning of discipline specific vocabulary in content areas (CCSS.ELA-LITERACY.RI.4.4). The centrality of technology in the CCSS English Language Arts standards has implications for interdisciplinary content area instruction because definitions of disciplinary and technological literacy are constantly evolving and becoming more nuanced. Using a TPACK framework (Mishra & Koehler, 2006), balanced literacy integration, and sociocultural theory as lenses, the following research questions guided our study:

1. How is writing and explicit literacy instruction embedded in science content instruction?
2. How do teachers utilize technology in science lessons to demystify academic discourse?

BACKGROUND

Disciplinary Literacy

Disciplinary literacy is a complex interaction between content specific knowledge and literacy practices that support content acquisition. Recent literature on the subject calls for an understanding of the distinction between “disciplinary literacy” and “content area literacy” (Gillis, 2014). Rather than taking literacy practices from the English classroom, disciplinary literacy looks at how scientists, mathematicians, historians, and literary critics engage in their discourses and then applies those skills to teaching content. Disciplinary literacy is integral to content acquisition as opposed to being an extra requirement for teachers.

Research shows that middle grades and high school science and math classrooms that effectively integrate literacy practices show better student learning and content understanding (Dew & Teague, 2015). Disciplinary literacy, as defined by Shanahan and Shanahan (2008), consists of advanced literacy instruction in the content area classroom. They contend that advanced literacy instruction includes content specific vocabulary instruction, explicit instruction in how to read and comprehend content specific texts, visualizing processes, and explicit instruction in how to write in a content area. Although these studies were conducted with middle grades and secondary teachers, they are directly applicable to elementary science classrooms where literacy instruction is often considered a separate lesson. There are also literacy practices that cut across the curriculum to promote comprehension skills: teacher think alouds, explicit attention to structure and genre of texts, summarizing, asking and answering questions while reading, and synthesizing information from multiple sources (Robb, 2003). These comprehension skills are vital to understanding content area texts and can occur at various stages in the learning cycle.

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