Content-Area Teachers as Teachers of Writing

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Recommended Citation

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Content Area Teachers as Teachers of Writing

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Despite movements to increase writing across the curriculum, at the high school level writing instruction is primarily the domain of the English Language Arts (ELA) teacher. However, the Common Core State Standards (CCSS) may change this. The standards, which had been adopted by 45 states as of this writing, include literacy standards for social studies/history, science, and technical subjects that specifically call on teachers in these areas[1] to address discipline-specific reading and writing skills at the middle and high school grade levels (National Governors Association). As states move toward implementing these standards, teachers from all departments will be asked to become "teachers of writing."

But are these teachers prepared to meet this challenge? And how can pre-service and in-service teachers in the content areas be supported to effectively incorporate writing into their classes? Drawing on work with high school science teachers, this article seeks to address these issues and offer suggestions for those working with writing teachers across the disciplines.

Relevant Literature

In their analysis of existing data, including data gathered as part of the National Assessment of Educational Progress (NAEP), Applebee and Langer found that "many students are not writing a great deal for any of their academic subjects, including English, and most are not writing at any length" (ii). They date this problem to the 1990s and the standards movement with its increased emphasis on reading and math. While some states included questions which required written answers as part of the tests mandated by No Child Left Behind (NCLB) legislation, Applebee and Langer suggest that "these may be shifting attention away from a broad program of writing instruction toward a much narrower focus on how to best answer particular types of test questions" (ii). In their national survey of high school social studies, language arts, and science teachers, Kiuhara, Graham, and Hawken found that most writing assignments asked for students to report information without analysis or interpretation; like Applebee and Langer, Kiuhara, Graham, and Hawken point out that "efforts to improve writing are virtually nonexistent in the school reform efforts in the United States" (136), particularly reforms mandated by NCLB. The lack of time spent on writing in American schools prompted The National Commission on Writing in America's Schools and Colleges to title their 2003 report *The Neglected "R:" The Need for a Writing Revolution*. However, although states have yet to begin standardizing testing over the Common Core State Standards, the standards may provoke change (if not a revolution); they appear to call for more complex writing tasks across the curriculum.

Yet teachers who have spent decades ignoring writing entirely or focusing only on writing test answers may not feel comfortable assigning or assessing other kinds of writing. In the field of science education, nearly 60% of teachers surveyed believed they were not prepared to teach writing (Kiuhara, Graham, and Hawken). These teachers, self-identified as non-experts in the field of writing instruction, may share some qualities with non-expert writers. In the 1980s several studies were undertaken to compare expert and non-expert writers; researchers concluded that novice writers tended to overlook writing problems that experts recognize (Hayes et al.) and defined revision as fixing problems at the word or sentence level (e.g. Bridwell; Faigley and Witte; Sommers). Likewise, a study comparing high school science teachers' responses to student writing in the genre of science journalism to responses by a professional journalist found that the teachers focused on grammatical and typographical errors while the professional editor looked at a wide range of content- and genre-related issues (Kohnen).

The fact that content-area teachers are unprepared to teach writing should come as no surprise. Required coursework in writing pedagogy is the exception, not the norm, for pre-service content-area teachers at most colleges of education, with some colleges reporting that this topic is covered in a more general literacy course, in a methods course, or only for English or social studies majors (Totten). Once they begin service, content-area teachers may find themselves facing writing-across-the-curriculum (WAC) mandates in their schools with little in the way of professional development or training to help them enact these initiatives. As a policy brief from the National Council of Teachers of English (NCTE) addressing the anticipated demand for more reading and writing across the curriculum (RAWAC) programs in response to CCSS argued, "if RAWAC is going to be incorporated into classes beyond ELA, teachers' views of RAWAC need to change, and schools will need to undertake significant programs of professional development" (The James R. Squire Office of Policy Research in the English Language Arts 16). This article reports on one such program.

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1   The fact that these literacy standards were included in the same document as the English Language Arts standards (and that the content-area literacy standards for grades K-5 were included as part of the ELA standards) did cause confusion, with some content-area teachers assuming that this meant disciplinary reading and writing was now part of the English Language Arts curriculum. However, the intent of the Common Core Standards is to include writing across content areas.

Science Teachers and Writing

In 2008, the National Science Foundation began funding a grant entitled "Science Literacy through Science Journalism," or SciJourn. The purpose of the project was to introduce teachers and their students to the concepts of science journalism in order to improve student science literacy[2] (see Saul et al. and Polman et al. for more information). Teachers[3] self-selected to participate in a summer professional development institute, modeled in part after the National Writing Project's summer institute, where they worked under the direction of an experienced science journalist and editor to propose, research, and write science articles intended for a teenage audience. After several rounds of revision, many of the teachers' articles were published in the grants' newsmagazine (*SciJourner* and www.scijourner.org). As part of the professional development, teachers were also working with program directors to think about how science journalism activities could be incorporated into their courses. Back in the classroom, many of their students wrote and revised science news articles, with a small percentage of these articles also appearing in the publication.

Initial Challenges. I became involved in the SciJourn project in 2009, first as a participating teacher (I was one of two ELA teachers in the pilot professional development institute) and later as a research assistant. My research involved exploring how science teachers came to incorporate writing into their classes, yet I quickly ran into a problem: I didn't speak the same language as science teachers. I went into my work knowing that science teachers would have a technical vocabulary and a set of discipline-specific teaching concerns that I would have to learn, but I hadn't anticipated how discipline-specific (and ELA-centric) my own language was. Even my research's most basic word, "writing," meant something different to me than it did to the science teachers with whom I was working. Science teachers used the word "topic" to refer to curricular concepts; I used the word to mean a narrow "topic" suitable for a news article. Many of the science teachers called science journalism "creative writing"; after puzzling over this, I concluded that "creative" was any kind of writing where students had choice and interest—and where the format was not strictly predetermined as in a lab report or a five-paragraph essay. At one point, I began keeping a list of words that we seemed to use differently. Other terms that made the list included "peer workshop;" "content;" and "revision."

In response to these challenges, I decided to collect information from the science teachers about their experiences with writing and responding to writing prior to involvement with the grant. I began with focus groups held during a professional development workshop with twenty-two science teachers present. The focus groups addressed these questions: (1) prior to SciJourn, what experiences did you have talking about writing and responding to writing?; (2) prior to SciJourn, how did you approach assessing the writing assignments that you gave? where did you get your ideas about how to assess/respond to writing?; (3) how have your ideas about responding to writing changed since you got involved with SciJourn? These sessions were audiotaped; I transcribed each and coded the transcripts, beginning with open coding followed by axial coding (Merriam). The two main categories that emerged from the transcripts were (1) types of writing teachers assigned and (2) teacher responses to that writing. Because the focus groups were short and did not offer equal opportunity for all teachers to respond, I distributed a follow up survey with more specific questions about the frequency and kinds of writing assignments as well as questions designed to understand teachers' feelings about these assignments.

This small data set confirmed much of the research cited earlier in this article. Although the teachers reported assigning slightly more writing than the literature suggests, most of this writing did not seem likely to provoke analysis or interpretation. The single most common assignment, given once a month or more by 20 of the 22 teachers surveyed, was "vocabulary/key terms," where students were required to write out definitions of vocabulary words from their textbook[4]. Other popular assignments included lab reports, answers to questions at the end of the chapter, and summaries of reading. During the focus groups, many of the teachers referenced school-wide mandates or initiatives as influencing the writing they assigned; the teachers attributed these policies to the pressures of standardized testing or other school accreditation. As the literature suggests, the kinds of writing mandated tended to be formulaic; teachers were taught to help students create "constructed response" answers that began with a rephrasing of the question or to write five-paragraph essays in timed environments. The teachers also described these policies as temporary; they came and went with changes in administration or changes in educational fads. No teacher spoke of a mandate or initiative in positive terms.

The teachers' negativity about writing extended beyond mandates or initiatives. In survey questions designed to understand teachers' attitudes about writing and writing response, most science teachers surveyed confirmed earlier research: they had little training in how to teach and respond to student writing (see table 1). Although some did claim to feel comfortable assigning writing, most of the teachers surveyed appeared to see writing as means of assessing specific content information. In the focus groups, teachers described themselves as looking for right or wrong answers; one teacher put it this way: "I just went through and said these are the pieces of information I'm looking for and boom, boom, boom, that was it." The literature on writing in the disciplines often

differentiates between two goals, "writing to learn" and "learning to write in the disciplines," but participating science teachers were not using writing for either purpose. "Writing to improve test scores" and "writing to demonstrate factual knowledge" would be more accurate labels. The science teachers did not find this satisfactory—they described writing in their classes with words like "tedious" and "horrific"—and many signed up for the SciJourn project specifically to address this situation.

Table 1
Science Teachers and Writing/Writing Response

Before SciJourn...	Yes	No
1. I could grade my writing assignments by looking for specific pieces of content information	21	1
2. I found the writing I assigned to be enjoyable to read	4	17
3. I felt comfortable assigning and responding to writing	7	13
4. I had training in how to TEACH writing	1	20
5. I had training in how to ASSESS/RESPOND TO writing (if yes, please explain below)	2	18

Note: For unknown reasons, not all teachers responded to all survey items.

Writing and Responding in Content-Centered Ways. Perhaps the most important difference between SciJourn and other writing initiatives the science teachers had been involved with was that SciJourn was actually *not* a writing initiative. Instead, the grant helped science teachers think about ways to use writing to meet a different goal, improving student science literacy. In some ways, the project moved science teachers toward a "writing to learn" approach; students were asked to write in the genre of science news so that they could *learn* the skills of a science journalist, skills like identifying relevant science topics, finding credible sources of information, and putting new information into context. During the professional development institute, the science teachers first became convinced of the importance of these skills and then saw the connection between the skills and writing. However, the project also involved an authentic publication opportunity that some teachers chose to emphasize in their classroom implementation; students who pursued publication actively were also "learning to write" in the genre of science news. As I saw it, in the SciJourn project "writing to learn" and "learning to write" became intertwined because of the specific genre in use. Learning to write like a science journalist also meant writing to learn, both about the topic and about the skills of science journalism.

Yet this may not have happened if the teachers had not been supported in their efforts to teach and respond to student science news articles. Although all of the science teachers were familiar with science journalism and many described themselves as avid readers of science news, none of them had looked at the genre closely prior to their work with the grant. According to the teachers, producing their own science news article during the professional development was a key experience; in this way, the grant followed the National Writing Project's philosophy that teachers of writing must be writers themselves. Yet, however important producing the first draft was, it was only the first step of the experience. The teachers worked with a professional science journalist and completed several revisions based on authentic feedback from an expert. Their learning of the genre was pushed beyond the superficial; they had to work with the genre deeply in order to meet publication standards. As teachers moved into classroom implementation, many drew heavily on the complete process of their own experience, particularly revision, in their work with students.

Once in the classroom, the teachers had several other resources to draw upon. In addition to being available for classroom support, members of the project worked on creating tools for the teachers' classroom use. The SciJourn Standards[5] were the most important product that grew out of this work. The authors of these standards sought to highlight the qualities of science journalism that were important to classrooms focused on student science literacy and ask that student articles: 1) are about local, narrow, focused, timely, and/or unique science topics; 2) use information from relevant, credible sources; 3) are based on multiple, credible sources; 4) contextualize information; and 5) are factually accurate and forefront information (see www.teach4scijourn.org and Saul et. al for elaborated descriptions of these standards). The standards do not capture every aspect of high-quality science journalism—in fact, they say little about writing and nothing about grammar—but all of the issues identified in the standards are familiar and important to science journalists. In short, the SciJourn standards articulate an educationally-relevant subset of the authentic standards of science journalism.

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2   The definition of science literacy is a contested one (see Roberts for a discussion of the issue); SciJourn defined "science literacy" as the skills students will need to deal with the science-related issues and decisions they will face fifteen years after high school graduation.

3   Of the 45 classroom teachers who participated in one of the three summer institutes, 35 were high school science teachers; four were high school ELA/journalism teachers; three were middle school science teachers; one was a high school agriculture teacher; one was a high school psychology teacher; and one was a middle school ELA teacher. Teachers came from 28 different schools, representing a diverse range of contexts (including public, private, urban, suburban, and rural).

4   During the focus groups, I realized that many of the science teachers were defining a "writing assignment" as any assignment that asked students to put pen to paper (or fingers to keyboard) and therefore my survey included such options as "answers to textbook questions" and "vocabulary/key terms." The Kiuhara et al. survey took a similarly broad view of "writing," while the Applebee and Langer study only included paragraph or longer types of assignments.

5   The SciJourn standards were developed over a period of years using an iterative process. The original version, developed in conversation with Alan Newman, Laura Pearce, Wendy Saul, Nancy Singer and Eric Turley, were first offered in 2010. The most current version of the standards is available at www.teach4scijourn.org.

Beyond the standards themselves, SciJourn team members developed additional standards-related resources to help the teachers apply the standards to their work with students. The standards were never designed to be handed wholesale to students; a related "student-friendly" set of standards was written that "translated" each standard into simplified questions teachers and students could pose to one another about science journalism. Questions included "who says?" to be asked after each assertion in a science news article, followed by "why should I trust them?" Laura Pearce, the grant's classroom implementation coach developed the SAFI (science article filtering instrument) which was designed to help teachers and students prioritize problems in science news articles; the worksheet included a section of most egregious concerns—like plagiarism or outright lies—that would result in the article needing to be completely redone, followed concerns related to the SciJourn standards. Inspired by the online tool "calibrated peer review" (http://cpr.molsci.ucla.edu/), we wrote questions based on the SciJourn standards and identified student sample articles for teachers to use to "calibrate" themselves and their students to what constituted a "high quality," "medium quality," and "low quality" example of student science journalism. We annotated articles that were published in our newsmagazine to illustrate what the SciJourn standards looked like in writing. Notably, we did not create rubrics based on the SciJourn standards; like Maja Wilson, we found rubrics in classroom contexts to create more concerns and questions than they solved.

In response to this, many teachers changed their practice, some significantly. Teachers who had always found themselves "correcting" student writing—either by circling grammatical errors or by marking specific content information as right or wrong—now had guiding principles to use when approaching student work. In professional development conversations, one teacher discussed how the SAFI enabled her to stop marking grammatical errors; another said that these tools helped her read her students' writing through to completion before making any suggestions. One teacher provided us with all of her comments on her students' writing; we saw her addressing a range of genre- and content-specific issues including asking for more sources of information and pushing her students to make the science in their stories more clear and explicit.

Asking their students to write in the genre of science news was a radical step for many of these teachers; yet without the SciJourn standards and the related tools, the assignment may not have been very different from any other. The standards, and the language that the teachers developed to talk about the standards with their students, gave the teachers a way to look at student writing that was meaningful: meaningful to the teachers' goals for the class, meaningful to the students' deeper learning, and meaningful to the genre itself.

Beyone the SciJourn Project: Lessons Learned

As schools work to move writing and writing instruction beyond the ELA classroom, the SciJourn project offers several lessons. First, it is important to recognize that many content-area teachers do not have significant training in writing pedagogy and, as a result, are using writing in potentially counterproductive ways. Discussions about what is actually occurring in classrooms—including conversations that clarify the most essential terms like "writing assignment"—are an important first step. After years of standardized-testing-inspired writing mandates, teachers are bound to be wary of another attempt to incorporate more writing, particularly if the approach does not take into account discipline-specific priorities for student learning. Content-area teachers are overburdened with their own curricular objectives; when they are asked to assign and respond to more "writing" in a generic way, many feel as if they have just been required to take on the ELA department's job as well. Empowering pre-service and in-service teachers to design their own discipline-specific writing assignments can help alleviate this concern. Exposing them to new genres—and requiring that they become writers of these genres themselves before they try to assign them to their students—can provide inspiration. As teachers design these assignments, they must also work to create tools to help them avoid falling into the "error correction" trap and instead enable them to stay focused on the important features of the assignment. In our assessment, these tools cannot be "generic"—they must be specific to the discipline and the genre.

All of these suggestions take time and expertise. If writing is truly to play an essential role across the curriculum, pre-service teachers in all disciplines need more guidance. Once in the field, teachers need time to collaborate both with their disciplinary colleagues to brainstorm and design assignments and across disciplines to learn from one another. School districts need to provide professional development opportunities which look at writing as something more than test preparation. The Common Core State Standards movement may provide an opportunity for dramatic change in the field of writing instruction, but teachers, schools, and colleges of education have to enact that change before CCSS fades away like so many reform movements before it.

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