Top Lang Disorders Vol. 32, No. 1, pp. 7–18 Copyright c© 2012 Wolters Kluwer Health | Lippincott Williams & Wilkins What Is Disciplinary Literacy and Why Does It Matter?

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Recently, it has been proposed that schools teach disciplinary literacy in science, mathematics, history, and literature classes as students move into middle school and high school. A disciplinary literacy approach emphasizes the specialized knowledge and abilities possessed by those who create, communicate, and use knowledge within each of the disciplines. This article compares dis- ciplinary literacy with the more widely emphasized approach known as content area literacy and provides an analysis of the growing research base underlying the disciplinary literacy construct. Research studies on disciplinary literacy are drawn from expert–novice comparisons in which think-aloud data are collected, during reading, from experts (i.e., mathematicians, chemists, his- torians) and students, and from functional linguistics analyses of the features of the grammars in disciplinary texts to identify the purposes and cognitive and communicative approaches that these grammars reveal. Finally, implications for school programs and instruction are considered. Key words: content area reading, disciplinary literacy, reading

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ATELY, attention educators to the reading have been that is turning done in their the content areas, such as mathematics, history, and science. The idea of focusing on read- ing within those subjects is not new, but it has gained new life as public attention has shifted from the problems of beginning read- ing to those of reading in adolescence. Educa- tion for young children has long accepted ex- plicit and separate reading instruction as one of the basic three Rs (along with ’riting and ’rithmetic). However, with older students, the educational circumstances are different— middle and high schools do not usually assign a reading class to all students; many secondary schools do not even have remedial reading

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classes; and the idea of a core reading program and extensive professional development in lit- eracy for teachers, both common practices in elementary education, are unusual.

Despite limited infrastructure and applica- tion, the idea of infusing literacy teaching into content subjects has complex roots and wide support. Yet, there is much confusion over what would constitute a sound content area literacy curriculum for middle school and high school students and what preparation their teachers need to receive. A fundamen- tal premise of content area reading has been that, in secondary schools, reading should be “taught mainly in the subject fields with regu- lar content materials and regular daily lessons” (Niles, 1965, p. 36). Educators have not yet reached this idyllic future, but content area literacy textbooks used for teacher education continue to promote the idea of content liter- acy as “the ability to use reading and writ- ing to learn subject matter in a given dis- cipline” (Vacca & Vacca, 2002, p. 15). As such, pre- and in-service training in content area reading education tends to emphasize the teaching of a generalizable set of study skills across content areas for use in subject matter classes.

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More recently, the notion of disciplinary literacy has emerged (Shanahan & Shanahan, 2008). Although disciplinary literacy is a dif- ferent construct from content area reading, its meaning has been confused to a great extent by those who erroneously use the terms in- terchangeably or who think that disciplinary literacy is just a new fad name for content area literacy. This is unfortunate because eliding these differences may lessen the likelihood that disciplinary literacy will gain a foothold in secondary education. Some might ask, “Why bother, if we are already teaching content area reading?” Our response is that failure to differ- entiate disciplinary literacy from content area literacy may mean that when schools do try to emphasize disciplinary literacy, teachers may struggle to support an ill-understood concept. Given the potential for such confusion, the purpose of this article is to provide a brief introduction to the concept of disciplinary lit- eracy. In this article, we explain what disci- plinary literacy is, how it is different from tra- ditional content area reading, where it comes from, and why it matters.

**DISTINGUISHING DISCIPLINARY LITERACY FROM CONTENT AREA LITERACY**

Content area literacy focuses on study skills that can be used to help students learn from subject matter specific texts. Disciplinary lit- eracy, in contrast, is an emphasis on the knowledge and abilities possessed by those who create, communicate, and use knowl- edge within the disciplines. The difference is that content literacy emphasizes techniques that a novice might use to make sense of a disciplinary text (such as how to study a his- tory book for an examination), whereas disci- plinary literacy emphasizes the unique tools that the experts in a discipline use to engage in the work of that discipline.

But would these approaches not overlap, at least, with regard to what middle school and high school students need to learn? Will the reading techniques of content area literacy not be the same as resources that disciplinary

experts employ? Surprisingly perhaps, the an- swer to these questions is often, “No.” Con- tent area reading prescribes study techniques and reading approaches that can help some- one to comprehend or to remember text bet- ter (with little regard to type of text), whereas disciplinary literacy emphasizes the descrip- tion of unique uses and implications of liter- acy use within the various disciplines.

The major premise of content area read- ing proponents has been that the cognitive requirements of learning and interpreting any kind of text are pretty much the same, no mat- ter what the subject matter. In some cases, research in this area has evaluated student learning using texts drawn from particular dis- ciplines, but despite this, nothing has been particularly specialized or discipline-specific about the guidance provided to the students. Examples of reports in which differences among disciplines have been ignored or elided include research on early study tech- niques such as SQ3R (survey, question, read, recite, review), which was recommended for use with content area textbooks (Robin- son, 1961). Other examples include early content area reading approaches, such as three-level guides (Herber, 1970); general reading comprehension strategies (e.g., sum- marizing, questioning, monitoring, visualiz- ing), such as those considered by the National Reading Panel (National Institute of Child Health and Human Development, 2000); and electronic tutoring tools and guidance sys- tems aimed at supporting readers’ metacog- nition and interpretive interactions with disciplinary texts (Graesser, McNamara, & VanLehn, 2005; Magliano et al., 2005).

Consequently, content area reading propo- nents tend to treat content differences as the major distinction among the disciplines. Al- though such proponents may acknowledge that one reads about mathematics in a mathe- matics book and history in a history book, they (along with many others who study reading comprehension) emphasize that what read- ers need is a common set of reading strategies that could be applied, perhaps with some mi- nor adjustments, to varied content area texts.

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Thus, although researchers may examine the use of a comprehension strategy, such as the use of paraphrasing, within the context of sci- ence text, the effectiveness of such a strategy within science reading would not make para- phrasing a discipline-specific reading strategy. There is nothing about paraphrasing itself that is special to reading science texts; rather, one would find paraphrasing to be as use- ful in the reading of any text of similar diffi- culty and correspondence with readers’ back- ground knowledge.

For the past couple of decades, research has been revealing that disciplines differ exten- sively in their fundamental purposes, special- ized genres, symbolic artifacts, traditions of communication, evaluation standards of qual- ity and precision, and use of language. With re- gard to language use, different purposes pre- suppose differences in how individuals in the disciplines structure their discourses, invent and appropriate vocabulary, and make gram- matical choices.

**Contrasts in vocabulary learning**

A major assumption of content area read- ing approaches is that students learn vocab- ulary similarly in different school subjects. It is easy to identify sets of words or terms that are associated with each content area. Mathematics, for example, might focus on terms such as minuend, rational, quotient, and rhombus; science on acid, adaptation, buoyancy, nucleus, and fermentation; social studies/history on affirmative action, Middle Ages, melting pot, Jim Crow, and migration; and literature on terms such as frugal, pro- saic, wary, and mundane. According to text- books aimed at teacher education in content area reading, the study skills that one would use to learn such terminology should be pretty much the same, no matter which set of words is targeted. Content reading textbooks, there- fore, recommend that teachers guide students to make connections among concepts, con- struct graphic organizers, brainstorm, create semantic maps, sort words, rate knowledge of words, analyze semantic features of words, categorize or map words, develop synonym

webs, and so on, for all subjects. But such strategies would not adequately recognize discipline-specific distinctions.

For example, an examination of the earlier presented science vocabulary terms reveals that the list is rife with words constructed from Greek and Latin roots. This structure is not unique to science words, of course, be- cause most English words have such roots. Because science uses such words extensively and for a purpose, however, analyzing the Greek and Latin derivatives can provide partic- ularly effective support in understanding sci- ence concepts. The purpose of constructing (and analyzing) words in this way is to of- fer a more complete and precise description of concepts than is possible with vernacular terms. Furthermore, such words are consid- ered more resistant to meaning changes and to the morphological shifts that occur across time and across languages (Nybakken, 1959). Generic, content area reading activities that encourage students to organize words, to use mnemonics, and to rehearse or repeat- edly match words with their meanings can be effective study aids with science words, but they would be insufficient. The per- spective of disciplinary literacy, in contrast, would emphasize that students should fo- cus on how and why scientific terminol- ogy is created and how to use tools such as analysis of Latin and Greek roots to un- pack often dense, but precise and recover- able, meanings. It would emphasize, for ex- ample, that relations among concepts are of- ten signaled by the vocabulary of classifica- tory sciences, such as botany (e.g., annual, biennial, perennial) or biology (e.g., mam- mal, carnivore, herbivore). General study techniques, such as repetition and mnemon- ics, are the province of content area literacy in science. In contrast, the nature of scientific vocabulary and the specialized tools to con- struct and analyze vocabulary used within the sciences are the forte of disciplinary literacy. History, in contrast to the sciences, does not focus so heavily on a Greek- and Latin- based nomenclature. Unlike science, his- tory is rife with openly metaphorical terms.

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Attempts at analysis of these words will not usually allow the reader to recover the mean- ing of the words, so a different approach would be more appropriate for studying his- tory vocabulary. Technical terms in history are meant less to carry precise definitions than to unify extensive collections of weakly interwo- ven groups and events (the Gilded Age) or to express a particular perspective on a partic- ular event or action (Dark Ages vs. Middle Ages). Such insights do not arise within a con- tent area reading approach, but they are es- sential to a disciplinary approach to teaching subject matter.

As these examples show, although content area literacy might, quite reasonably, guide students to organize the vocabulary in a hier- archical manner that shows the relations among terms, a disciplinary approach might alternatively organize the vocabulary in terms of the authorial perspectives that it conveys. Both content area reading and disciplinary lit- eracy may be able to support vocabulary learn- ing, but they do so in different ways. It is our position that it is essential to understand these differences. To summarize differences in the area of vocabulary, although content area reading often does recommend the teach- ing of roots and combining forms, it is no more likely to tout this approach for science vocab- ulary than for the vocabulary of any other dis- cipline. Significantly, no treatment of content area reading encourages teaching students the reasons why science vocabulary (in contrast to history vocabulary) is constructed in the ways that it is.

**Other language differences**

Similarly, functional linguistics has iden- tified subtle, but profound, differences in the language used in the various disciplines (Fang & Schleppegrell, 2008; Halliday & Martin, 1993). “Secondary-level science, so- cial studies, language arts, and mathematics use patterns of language that enable these disciplines to develop theories, engage in in- terpretation, and to create specialized texts” (Fang & Schleppegrell, 2008, p. 4). These pat- terns of language, or grammars, include differ-

ences not only in the nature of the technical vocabulary but also in points of view, attri- bution of causation and agency, passive and active voice, and other linguistic differences that undergird the nature and purpose of the disciplines.

As examples of linguistic analysis, Fang and Schleppegrell (2008) traced the use of nomi- nalization within science; that is, the render- ing of verbs and adjectives into nouns. For example, water may evaporate (verb) but sci- entists study and write about the process of evaporation (noun). Fang and Schleppegrell claimed that, by helping students to unpack this kind of noun, teachers can provide them with a better understanding of science text. Furthermore, Fang and Schleppegrell noted that such effort makes the text less abstract while giving students valuable insights into the nature of science and scientific commu- nication. One of the major benefits attributed to nominalization is that it shifts the empha- sis from social agents to natural agents in the consideration of causation, which is a central premise in most scientific concepts.

In contrast, history texts and literary texts are less likely to focus on nominalized sub- jects. Although they, too, address causation, understanding human agency (rather than physical cause–effect) is more central to their purposes. Again, as students examine varied disciplinary choices or relatively specialized patterns of language use, they may become better equipped to deal with the learning de- mands of the particular disciplines. Variations occur, of course, within social and scientific studies. For example, in most sciences, human agency is attenuated; whereas in ecology and environmental sciences, human causation is more important. In fields such as physics, bi- ology, and chemistry, human agency is not a central concern, whereas in the environmen- tal sciences, there is increasing interest in the role that is played by human actions and how they influence aspects of the environment.

**Contrasts in levels of author awareness**

Language differences revealed by linguistic analysis are only a part of what distinguishes

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the disciplines. Another example of a disci- plinary difference with profound implications for literacy is the reader’s awareness of the au- thor.

Research has shown (Shanahan, 1992; Shanahan, Shanahan, & Misichia, 2011) clear differences in how those in the various dis- ciplines think about the author during read- ing. For example, in history reading, au- thor is a central construct of interpretation (Wineburg, 1991, 1998). Historians are always asking themselves, “Who is this author and what bias does he or she bring to the text?” This is somewhat analogous to the lawyer’s common probe, “What did he know and when did he know it?” Consideration of author is deeply implicated in the process of reading history, and disciplinary literacy experts have hypothesized that “sourcing,” that is, thinking about the implications of author during inter- pretation, is an essential history reading pro- cess (Wineburg, 1991, 1998). Furthermore, studies show that author awareness can, at least under some circumstances, be taught to students in a way that improves their learn- ing (Hynd-Shanahan, Holschuh, & Hubbard, 2004).

Although historians and history students must consider a text’s authorial source to understand context, research has revealed a different pattern of reading for scientists (Shanahan et al., 2011). Our interviews with chemists have shown that they do rely on au- thor but more as a topical or quality screen when determining which texts to read. In our research, chemists admitted that they con- sider the laboratory with which an author may be associated to determine whether a text would be worth the time to read. Once read- ing begins, unlike the historians, however, sci- entists try to focus their attention specifically on the text. Considerations of author, accord- ing to chemists, should play no part in the interpretation of text meaning, something re- vealed in their think-alouds both during read- ing and in postreading interviews. In our re- search, this pattern of intentionally ignoring the author was even more evident in the read- ing done by mathematicians, who explained,

almost stridently, that thinking about author would only be a distraction and that it could help in no way within the process of making sense of the text.

To bring the discussion of author full cir- cle, whether the author should be considered interpretively has been a matter of great con- troversy within the field of literary criticism (English) for more than 50 years. Literary the- orists have worked long and hard to mini- mize or discount entirely the author during interpretation (Brooks & Warren, 1938; Fish, 1980; Foucault, 1979; Gadamer, 1975; Rosen- blatt, 1978; Wimsatt & Beardsley, 1946). Thus, some literary critics argue for the close read- ing of “authorless” texts, much in the fash- ion of the scientific or mathematical readings described earlier, whereas other critics allow for some consideration of the author, at least for making sense of the author’s ideological stance, as in the historical readings already described.

These differences suggest that students must always read history with an eye to the author, while never reading mathematics that way. Students should reflect on authorship sparingly in science reading, though never to make sense of the text. When reading litera- ture, they should sometimes interpret the au- thor along with the text and, at other times, focus on the words of the literature with no consideration of the author at all.

The aim of disciplinary literacy is to identify all such reading- and writing-relevant distinc- tions among the disciplines and to find ways of teaching students to negotiate successfully these literacy aspects of the disciplines. It is an effort, ultimately, to transform students into disciplinary insiders who are able to approach literacy tasks with some sense of agency and with a set of responses and moves that are appropriate to the specialized purposes, de- mands, and mores of the disciplines.

**Summary**

In this section, we have described the newer ideas of disciplinary literacy in some detail. Content area literacy, on the contrary, has been around longer and is the focus of

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dozens of teacher education textbooks. We should, therefore, be able to summarize the agenda of content area literacy proponents more efficiently.

It is evident from examining several decades of content area reading/literacy text- books that the largely agreed-upon purpose of content area reading approaches is to pro- vide students with a collection of generic read- ing strategies and study skills that will boost learning in all disciplines. For example, these approaches teach students to preview books through examination of tables of content and indices, preview of chapters through use of subheadings, and use of various print devices (e.g., italics, bold, font and point variations) to make sense of text. They promote the use of purpose setting and predicting, along with a rich collection of reading processes or strate- gies (e.g., visualization, summarization, clar- ification, questioning), and the use of par- ticular study or teaching devices (e.g., Cor- nell note-taking, three-level guides, advance organizers).

A distinguishing feature is that the content area reading agenda aims not so much to help students to read history as an historian might but rather to read history with grasp of the information, using a set of generic learning or study tools that may be implemented in any subject. Thus, the focus of content area in- struction is less on providing students with an insider’s perspective of a discipline and ways of coping with the unique properties of par- ticular disciplines than on providing students with tools to better remember the information regardless of the nature of the discipline.

**SOURCES OF DISCIPLINARY LITERACY**

Basically, disciplinary differences in literacy exist because of differences in the disciplines themselves. These differences are inherent in the varied phenomena that are the focus of each of the disciplines. Historians study past events through an examination of primary documents and secondary sources; whereas scientists analyze, especially, exacting experi- mental and observational evidence and logic.

Mathematicians focus on the implications of a set of axioms or self-evident truths or givens; whereas literature explores fictional or imagi- national representations of human relations or development. These foundational differences in the disciplines require differences in texts and language and therefore differences in ap- proaches to reading and writing.

The roots of the disciplinary literacy con- cept are threefold. They can be found in the historical development of content area reading, cognitive analyses of expert readers, and functional linguistics. The history of con- tent area reading has been described in detail by Moore, Readence, and Rickelman (1983), and we rely heavily on that treatment. Moore et al. traced the history of content area read- ing research to the 1920s, when recognition of the importance of reading in content sub- jects began.

**History of content and disciplinary literacy**

From the beginning, the emphasis of con- tent area reading was on instructional appli- cations of the relation of reading to content subjects. For instance, the National Commit- tee on Reading explored this topic in the classic 24th Yearbook of the National So- ciety for the Study of Education (Whipple, 1925), which provided guidelines and sam- ple lessons emphasizing how to find answers to questions, follow directions, select major ideas, remember content, identify key words, self-question, and make notes.

As a result of the recognition of the importance of reading in school subjects ac- corded by the National Committee of Read- ing, researchers began exploring the issue. According to Moore et al. (1983), the early studies focused on the identification of impor- tant vocabulary in textbooks from various sub- jects, the availability and effectiveness of vari- ous instructional procedures, and correlations of comprehension measures based on general and subject specific texts. Moore et al. con- cluded, “Although these reports indicated var- ious degrees of similarity between ‘general’ and ‘specific’ comprehension, all concluded

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that the subjects presented distinct reading demands” (p. 429). Thus, despite the fact that their methods of research did not permit dif- ferences to be discerned, content area read- ing researchers typically promoted the no- tion that reading proficiency would be sub- ject distinct. Furthermore, this idea of spe- cialized reading has long been rhetorically honored in pedagogical treatments of con- tent area reading, despite the fact that authors of content area reading textbooks for teach- ers have mainly endorsed general approaches to reading that were applicable generically across all subject matters.

Thus, the role that content area reading has played in the development of disciplinary literacy has largely been aspirational. It has pointed toward a theoretical conception of literacy processes specialized to particular disciplines while fostering a fundamentally different approach, based upon highly gener- alizable learning strategies or processes that could be easily adapted and used across dif- ferent school subjects.

**Expert reader studies**

A more empirical source supporting disci- plinary literacy approaches has emerged from expert reader studies completed over the past three decades in various disciplines (summa- rized by Shanahan et al., 2011). Drawing on the expert–novice paradigm from the cogni- tive sciences, these studies have used obser- vations and think-aloud protocols to identify performance differences.

In this paradigm, the individuals who are particularly proficient in some skill, such as the literacy of a particular discipline, are iden- tified. Then, these experts are asked to per- form their skill (e.g., reading a science text) while thinking aloud. Less skilled individuals, perhaps students of the discipline, are ob- served in the same way, and differences are noted. A permutation on that approach is to compare the relative performances of experts from different fields of study. Such studies have focused on the reading of science (Bazer- man, 1985; Latour & Woolgar, 1979; Shanahan et al., 2011); history (Rouet, Favart, Britt, &

Perfetti, 1997; Shanahan et al., 2011; Wineb- urg, 1991); and poetry (Peskin, 1998). They have gone a long way toward establishing the idea that disciplinary experts read differ- ently from novices in their fields and, equally important, differently from experts in other fields.

For example, studies of the reading of physi- cists (Bazerman, 1985) revealed that they tended to pay particular attention to informa- tion that they did not already know and infor- mation that violated their expectations. The physicists separated reading to learn from crit- ical reading, reserving the latter for work that was directly applicable to their own work. Historians were found to engage in sourcing (paying attention to the author), contextual- ization (connecting texts to the circumstances of the time), and corroboration (making com- parisons across texts). Furthermore, unlike scientists, historians did not suspend their crit- ical stance when they read information about which they knew little (Wineburg, 1991). As would be expected from studies using such an approach, this body of research identified strategies, perspectives, choices, and tenden- cies used by experts that involved a sense of self-awareness.

**Functional linguistics**

Another approach, and the third source for differentiating disciplinary literacy, arose from functional linguistics (Halliday & Matthiessen, 2004). Functional linguistics is concerned with the choices made available to language users by a grammar. The choices as- sociate speakers’ and writers’ intentions with the grammar. Thus, analyses of functional lin- guists can reveal important insights about the nature and conduct of the language users of particular disciplines. Although functional lin- guistics focuses on grammar, it does so by considering contextualized and practical uses of language, making it useful for considering differences across disciplines.

The tools of functional linguistics have been used to analyze the discourses of science and history (Halliday & Martin, 1993; Schleppe- grell, 2004; Veel, 1997; Wignell, 1994).

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Earlier, we described how and why sci- ence texts employ nominalization; studies also have considered how such texts classify and describe phenomena (Halliday, 1994). History, in contrast, does not focus heav- ily on classification but, instead, construes actions and events, verbal and mental pro- cesses, descriptions, and background informa- tion (Schleppegrell, 2004). This means that verbs carry much of the meaning in history texts. Science texts, on the contrary, may be more tentative about conclusions than is his- tory. This is because, in science, it is essential to be explicit about the degree or extent to which phenomena occur and scientists are more likely to present a mélange of mathe- matical equations, graphics, and prose. The reason for this explicitness and precision is that scientific claims are used to predict future reactions under similar conditions; even life and death can turn on the accuracy of scien- tific information. Because historians interpret events from partial documentation collected after the fact, the claims historians make of- ten are not precise enough to determine the degree to which they are accurate. Historians strive instead to make claims plausible, given the evidence, and have different evidentiary constraints and standards from scientists.

Disciplinary literacy, then, is drawn from the largely unrealized aspirations of content area reading and, more substantively, from a growing body of cognitive and linguistic research that examines how disciplinary ex- perts read and how language is structured in disciplinary texts. As such, the empirical roots of disciplinary literacy are not focused specifically on teaching, though many insights drawn from these studies are proving to be useful to literacy and disciplinary teaching. For example, Fang and Schleppegrell (2008) have developed several strategies on the ba- sis of functional linguistics analyses for guid- ing students to make better sense of their textbooks. Shanahan and Shanahan (2008) have translated some of the expert reader analyses into practical classroom applications as well.

**WHY DISCIPLINARY LITERACY MATTERS**

At this stage, the body of scientific research evidence is not yet sufficient for demonstrat- ing the effectiveness of disciplinary literacy in- struction at improving either literacy achieve- ment or subject matter success. Only a few studies testing the efficacy of such methods have been undertaken so far and with mixed results (De La Paz & Felton, 2010; Hynd- Shanahan et al., 2004; Nokes, Dole, & Hacker, 2007). Nevertheless, the approach is promis- ing and needed for several reasons.

First, although content area reading meth- ods have been successful in a plethora of research studies over a long history, they have not made great headway in the schools (O’Brien, Stewart, & Moje, 1995). This is de- spite the fact that most secondary level teach- ers are required to have some training in content area reading (Romine, 1996). Various reasons have been proposed for this, none more important than the idea that content area reading approaches have not appealed to most content area teachers. The resistance of pre- and in-service teachers to these meth- ods, however, is well documented (Lesley, Watson, & Elliot, 2007; Moje, 1996; O’Brien & Stewart, 1990; Reehm & Long, 1996; Simonson, 1995; Stewart, 1990; Stewart, & O’Brien, 1989).

One explanation is that issues of affiliation and identity are important in the development of young teachers (Britzman, 1994; Varghese, Morgan, Johnston, & Johnson, 2005). Some- one who aspires to be a science or mathemat- ics teacher is much more interested in repli- cating what science or math educators usually do rather than appropriating routines from reading education. Also, even when subject matter teachers do attempt to use procedures and activities drawn from content area read- ing, they often find these approaches to be ill- fitting with regard to the purposes of their dis- ciplines or the nature of the texts to be read. In addition, reading strategies are not usually integrated into the subject matter curriculum;

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thus, teachers are left to determine how they can fit them on top of an already full agenda of instruction. Finally, teachers are usually motivated by the success of their students. The effectiveness of instructional procedures that often foster improvements only among the lowest performing students (Bereiter & Bird, 1985) may not be sufficient to be noticed or valued by content teachers.

Prior researchers have often interpreted the finding that strategies are more supportive of less skilled readers as evidence that read- ers are already using the strategies in ques- tion. However, this conclusion is not entirely consistent with the findings of think-aloud studies conducted with good readers. It also ignores the possibility of multiple routes to reading success. Nevertheless, instructional procedures that are only beneficial for some students are not as attractive to content teach- ers as would be approaches with more general benefit.

On the contrary, disciplinary reading ap- proaches hold the promise of being more ap- pealing than traditional content area reading approaches to content area teachers. Because the insights and strategies of disciplinary lit- eracy are drawn from the disciplines them- selves, a focus on this information does not pose the same challenges to teachers whose self-actualization is tied to their identities as mathematics, science, English, or history ed- ucators. If anything, the insights drawn from disciplinary literacy help these teachers to bet- ter understand the practices of their respec- tive disciplines. Instructional practices that have been drawn from examinations of disci- plinary texts and studies of successful-reader interactions with such texts seem more likely to produce procedures that facilitate the au- thentic learning demands of the disciplines than those practices that have been true of traditional content area reading routines.

The use of the so-called “generalizable” strategies of content area reading pose fun- damental problems to learners, who must not only learn the strategies but must also rec- ognize when they would be sensible to use in a particular discipline and then must ad-

just them to fit to the actual demands of the disciplinary texts. Such generalization can be very difficult in any learning situation. If disciplinary reading procedures require less stretching of strategies to texts, it stands to reason that these procedures would be more useful and more effective for secondary stu- dents to learn.

An open question with regard to the value of disciplinary literacy strategies has to do with whom these new approaches will be ef- fective. As has been noted, traditional reading comprehension strategies and content area reading approaches have tended to be most beneficial for the lowest-proficiency readers, with lesser impact on results with average- and higher-proficiency readers. Perhaps, dis- ciplinary strategies would have the same pat- tern of results, although given the specificity of disciplinary reading strategies and their em- phasis on higher levels of thinking, this might not be the case. Further research is needed to make these determinations.

Many content area reading procedures seem to focus most heavily on getting stu- dents to engage with a text and to pay atten- tion to the ideas expressed in the text. Less proficient readers are easily distracted and of- ten do not think much or well about what they are reading; their focus often seems to be more on getting through the reading than trying to gain anything from the reading. Hav- ing students summarize what they are read- ing, ask themselves questions about the in- formation in the text, and set purposes for their reading all offer the possibility that the students will, through the use of these tools, focus to a greater extent on what a text says and consequently, would benefit their learn- ing. Proficient readers tend not to have the same problems with concentrating on the text information or trying to make meaning from it, though they do not always demonstrate the highest levels of interpretation. Strategies that guide one to think more effectively in a discipline-specific manner could guide such students to go beyond a superficial under- standing and to grasp deeper and more so- phisticated ideas. Thus, a student who could

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retell the basic story in a piece of literature might be better able to construct a theme or to interpret multiple perspectives or points of view in short stories or novels as a result of applying insights drawn from that discipline. Similarly, a student who could retell many facts from a history book but fail to grasp the author’s underlying argument might, through disciplinary strategies, be able to analyze such reasoning or even to construct his or her own arguments from the information. If sub- ject matter teachers see their average and advanced students improving, gaining better purchase on the content of the class, it is pos- sible that they would be more likely to sus- tain their efforts at using such approaches in instruction.

What about the lowest performing students who struggle to gain even the most basic in- formation from their content texts? Will dis- ciplinary strategies benefit the better readers while casting aside the basic needs of their less proficient peers? Again, it is impossible to answer such questions without empirical study. But there is a very real possibility that disciplinary literacy approaches would be suc- cessful even with less proficient readers. As we have indicated, instructional procedures that have usually been successful with such students have done so by stimulating them to engage with text. There is no reason to believe that encouraging more disciplinary engage- ments would be any less successful in that regard. Thus, disciplinary strategies might be more attractive to content area teachers be- cause it is possible that such procedures will be facilitative of the learning of a wider distri- bution of students.

**CONCLUSION**

We believe that teaching disciplinary lit- eracy will provide learning advantages to

middle school and high school students. Various assessments have shown that sec- ondary school students in the United States are not reading well enough to succeed in careers or college, with particular con- cerns about their readiness to participate in the so-called STEM (Science-Technology- Engineering-Mathematics) professions.

We also believe that students would make greater progress in reading the texts of his- tory, science, mathematics, and literature if instruction provided more explicit guidance that helped them to understand the special- ized ways that literacy works in those disci- plines. This approach stands in stark contrast with the more widely espoused content area reading approaches, which promote reading strategies that can be used in all disciplines rather than facilitating students’ awareness of the specialized nature of literacy in each dis- cipline.

Supporting our position, we have pre- sented evidence from expert–novice com- parison studies and analyses of texts us- ing the tools of functional linguistics. These sources have increasingly revealed the unique properties of the disciplines. Insights from those studies, we believe, hold impor- tant implications—and potential promise— for supporting more effective instructional ap- proaches for teaching all students to read dis- ciplinary texts. The importance of realizing this promise is now recognized in the new, aptly named “common core state standards for English language arts and literacy in his- tory/social studies, and science/technical sub- jects,” which have been adopted as the ba- sic curriculum by more than 40 U.S. states (National Governors Association/Council of Chief State School Officers, 2010). Greater focus on disciplinary literacy is needed to help secondary level students achieve these standards.

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