

WHITE PAPER

Disciplinary Literacy

Integrating Literacy Instruction in All Subjects, Grades 6-12

A Keys to Literacy White Paper by Joan Sedita

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Joan Sedita, November 12, 2024

As students advance through middle and high school grades, the required level of literacy skills increases significantly to meet the growing demands of reading and writing in different content areas. Students need to be able to understand the language used in school texts that becomes increasingly complex and specialized. This white paper focuses on what is frequently described as *disciplinary literacy* – what it is, how it is different from basic reading skills and content literacy (i.e., general reading skills and strategies), and the role that content area teachers can play in helping students develop the literacy skills needed to support content learning.

What is disciplinary literacy?

Disciplinary literacy refers to how an expert in a discipline (i.e., science, history, mathematics, literature, and other subjects) uses specialized knowledge and abilities to read, write, think and communicate. (Shanahan & Shanahan, 2008; Shanahan & Shanahan, 2012; Jetton & Shanahan, 2012; Goldman et al., 2016). It encompasses the idea that students need to be taught highly specialized skills that differ from subject to subject, developed as *disciplinary habits of mind* (Fang, 2012). It presumes that reading and writing are specialized, unique, and vary across the disciplines, and different kinds of texts require different strategies (Schoenbach & Greenleaf, 2009; Shanahan, 2017). Disciplinary literacy is not just learning about a discipline; it is also about reading, writing, speaking, and listening the same way the historian, scientist, mathematician, or literary expert does. Also, the practices inherent in one content area are not generalizable to other content areas, or even within subjects of a single content area (Shanahan & Shanahan, 2008). Examples include reading and interpreting a calculus word problem, understanding that in science the letter “n” represents the sample size in experimental data, and recognizing that iambic pentameter (a rhythm scheme) used by Shakespeare is specific to literature.

Disciplinary literacy moves beyond content literacy (common reading and writing strategies used across all content areas) and focuses on the unique aspects of specialized texts, forms of writing, and modes of inquiry that experts use in an academic discipline.

Dr. Cynthia Shanahan (2014) explains disciplinary literacy as follows:

In order for someone to read, really read in a particular discipline like history or science, or literature, they should really know something about the discipline itself because every discipline has certain expectations. They (disciplines) have different ways of creating knowledge. Each discipline has a different way of sharing that knowledge, and each discipline has a different way of evaluating that knowledge. These disciplines are really different, and if you know a little bit about what the expectations are and the discipline, that can guide your reading. It can provide you with an approach to reading that will give you a more critical, deep knowledge about what you’re reading.

Gabriel and Kelley (2014, p. 209) point out that as study and participation in academic disciplines becomes more specialized, “students and teachers must engage in texts produced by and used within a

discipline, rather than those written about topics related to that discipline.” For example, there is a difference between reading a high school science textbook and a scientific journal.

A New Focus on Disciplinary Literacy

Experts in the field of literacy began focusing more on the topic of disciplinary literacy beginning in 2008 when Drs. Timothy and Cynthia Shanahan published their seminal 2008 article *Teaching Disciplinary Literacy to Adolescents: Rethinking Content-Area Literacy*, followed by their 2012 article *What Is Disciplinary Literacy and What Does It Matter?* In the 2008 piece, they presented data collected from a study that asked how disciplinary experts approached reading and how those approaches might be translated into instruction for high school students. The findings suggested that experts from math, chemistry, and history read their respective texts quite differently. The authors concluded (2008, p. 57):

This project has helped us rethink the basic content-area literacy curriculum that needs to be taught to preservice teachers in secondary education, and it has revealed the benefits of having a conversation among disciplinary experts, literacy experts, high school teachers, and teacher educators. Instead of trying to convince disciplinary teachers of the value of general reading strategies developed by reading experts, we set out to see if we could formulate new strategies or jury-rig existing ones so that they would more directly and explicitly address the specific and highly specialized disciplinary reading demands of chemistry, history, and mathematics.

Research Supporting Disciplinary Literacy Instruction

What guidance does research provide about teaching disciplinary literacy? There is not a significant research base that shows a disciplinary literacy approach to be highly effective, or studies determining the most effective way to teach disciplinary literacy strategies. In 2012, Goldman pointed out that research related to disciplinary literacy was just emerging at that time and most of the studies were descriptive rather than experimental, yet nevertheless instructive.

In their 2012 article, Drs. Timothy and Cynthia Shanahan noted:

At this stage, the body of research evidence is not yet sufficient for demonstrating the effectiveness of disciplinary literacy instruction at improving either literacy achievement or subject matter success. Only a few studies testing the efficacy of such methods have been undertaken so far and with mixed results. (p. 14)

They did go on to say, however, that the approach is promising, and suggested students would make greater progress in reading the texts of history, science, mathematics, and literature if instruction provided more explicit guidance that helped them to understand the specialized ways that literacy works in those disciplines.

Later, in a 2017 blog post, Dr. Timothy Shanahan noted:

Since disciplinary literacy is a relatively new thing for schools, there is a flood of questions about it. And, because the research is lagging classroom demand, there is only a trickle of research-based answers to provide.

Even with the current limitations in research on disciplinary literacy, this does not mean there is no merit to supporting disciplinary literacy. A compelling case can be made that integrating a disciplinary literacy approach along with content literacy instruction enhances students' understanding of content and helps them connect literacy skills to real world applications. Educators would benefit from additional research to determine with more certainty what and how content teachers can effectively integrate disciplinary literacy into their classrooms.

What is content literacy?

Content literacy is skills, strategies, and routines that focus on reading, writing, discussion, word-learning skills, and language that can be used across subjects that are sometimes referred to as *generic skills* and *study skills* (CEEDAR Center; Shanahan & Shanahan, 2012; Fagella-Luby, 2012; Shanahan, 2017). Research that has accumulated over decades has supported the use of general reading and writing strategies that are integrated into content classrooms (Brozo et al., 2013; International Literacy Association, 2017; Hwang et al., 2021; Sedita, 2024A).

Shanahan and Shanahan (2012, p. 12) note the following about content literacy:

It is evident from examining several decades of content area reading/literacy textbooks that the largely agreed-upon purpose of content area reading approaches is to provide students with a collection of generic reading strategies and study skills that will boost learning in all disciplines.... They promote the use of purpose setting and predicting, along with a rich collection of reading processes or strategies (e.g., visualization, summarization, clarification, questioning), and the use of particular study or teaching devices (e.g., Cornell note-taking, three-level guides, advance organizers). A distinguishing feature is that the content area agenda aims not so much to help students read history as a historian might, but rather to read history with a 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 instruction is less on providing students with an insider's perspective of a discipline and ways of coping with the unique properties of particular disciplines than on providing students with tools to better remember the information regardless of the nature of the discipline.

Common Core State Standards and Content Literacy

The advent of the Common Core State Standards (National Governors Association Center for Best Practices and the Council of Chief State School Officers, 2010) and their adoption by numerous states increased the interest in content literacy because they included literacy standards in grades 6 to 12 for science, social studies, history, and technical subjects. This included cross-discipline reading and writing standards requiring students to think critically with text, and to read, write and speak using evidence-based information. For the first time in many states, literacy expectations for teachers went beyond just English language arts educators. Consider the following statements about the standards:

The Standards insist that instruction in reading, writing, speaking, listening, and language be a shared responsibility within the school... Part of the motivation behind the interdisciplinary approach to literacy promulgated by the Standards is extensive research establishing the need for college and career ready students to be proficient in reading complex informational text independently in a variety of content areas. (National Governors Association Center for Best Practices and the Council of Chief State School Officers, 2010, p. 4)

Literacy standards for grade 6 and above are predicated on teachers of ELA, history/social studies, science, and technical subjects using their content area expertise to help students meet the particular challenges of reading, writing, speaking, listening, and language in their respective fields. (Massachusetts Department of Elementary and Secondary Education, 2011, p. 3)

The Common Core State Standards (and similar standards adopted by many states) include numerous standards that align with reading, writing, speaking, and vocabulary instruction for content literacy skills and strategies that can be applied to any subject, such as those needed to address these examples of anchor standards:

- Reading Anchor Standards: determine central ideas or themes of a text and summarize key details and ideas (#2); interpret words and phrases as they are used in a text and analyze how specific word choices shape meaning and tone (#4); analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of text relate to each other and the whole (#5); integrate and evaluate content presented in diverse media and formats (#7); delineate and evaluate the argument and specific claims in a text, including the validity of the reasonings as well as the relevance and sufficiency of the evidence (#8)
- Writing Anchor Standards: write arguments, informative/explanatory texts, and narratives that include introductions, conclusions, and body development based on the type of writing (#1, #2, #3); produce clear and coherent writing appropriate to task, purpose, and audience (#4); develop writing by planning, revising, editing, rewriting (#5); gather relevant information from multiple sources, assess the credibility and accuracy, and integrate the information while avoiding plagiarism (#8)
- Speaking and Listening: prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on each others' ideas and expressing their own clearly and persuasively (#1); present information, findings, and supporting evidence such that listeners can follow the line of reasoning, appropriate to task, purpose, and audience (#4); make strategic use of digital and visual displays of data to express information (#5), adapt speech to a variety of contexts and communicative tasks, demonstrating a command of formal English (#6)
- Language: determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting reference materials (#4); acquire and use accurately a range of general academic and domain-specific words and phrases, demonstrate independence in gathering vocabulary knowledge (#6)

Content Literacy and Disciplinary Literacy Distinctions

The International Literacy Association's literacy leadership brief *Content Area and Disciplinary Literacy* (2017) points out that content literacy and disciplinary literacy "are umbrella terms that describe two approaches to literacy instruction embedded within different subject areas or disciplines." The brief explains that with content literacy, teachers explicitly teach and model reading and writing processes that are common across disciplines and provide opportunities for students to practice them independently or in small groups. Under a disciplinary approach, students use literacy to engage in goals and practices that are unique to each academic discipline. The brief points out the difference between content and disciplinary literacy related to reading and interpreting text (p. 2-4):

- *Content Literacy*: Students use clarifying questions, read headings and use text structure, summarize, make predictions, and engage in other comprehension or vocabulary strategies and word analysis strategies.
- *Disciplinary Literacy*: Students read and evaluate texts like somebody in the discipline would, including engaging in critique of these texts and the content in them.

Fagella-Luby and colleagues (2012, p. 69) offer this comparison between content and disciplinary literacy:

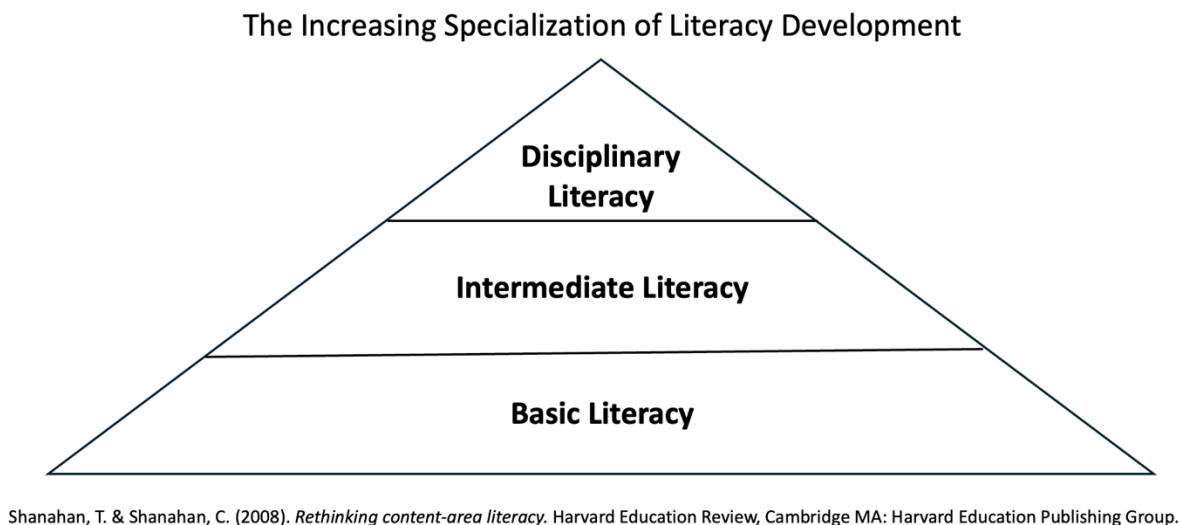
A discipline-specific strategy might teach students historical reasoning to reconcile differences in primary sources; whereas a general strategy might teach students to compare and contrast differences between the two sources. A historical reasoning strategy would be appropriate only with social studies content; whereas the compare-contrast strategy could be generalized to any content.

Levels of Literacy: Basic, Content, Disciplinary

In 2008, Drs. Timothy and Cynthia Shanahan proposed a model of literacy progression in three levels, in the form of a pyramid, shown in Figure 1.

- ***Basic Literacy*** at the base of the pyramid includes skills that are mastered by most students during primary grades, such as decoding skills, print conventions, recognition of high-frequency words, structural properties of text, and the presence of an author.
- ***Intermediate Literacy*** in the middle of the pyramid includes literacy skills common to many tasks, including generic comprehension strategies such as predicting and summarizing, decoding multisyllabic words easily, learning academic vocabulary, recognition of more complex forms of text structure, critical responses to text, and gradually more specialized generic reading routines. The authors note that these skills are learned during upper elementary and middle grades, but it is common to find high school students who still struggle to read texts because they have not mastered these skills.
- ***Disciplinary Literacy*** at the top of the pyramid represents more sophisticated but less generalizable skills and routines specialized to history, science, mathematics, literature, or other subject matter. These high-level disciplinary skills and abilities are not easy to learn since they are applied to difficult texts and are rarely taught.

Figure 1



Sedita (2021) developed a similar model for identifying the levels of literacy that support a Multi-Tiered System of Support (MTSS) framework where adolescent students receive core (Tier I), supplemental (Tier II), and intervention (Tier III) instruction based on the individual needs of students, shown in Figure 2. The model suggests students in middle and high school grades who have difficulty with reading and writing need Tier II supplemental or Tier III intervention support to develop missing basic, foundational reading and writing skills. This remedial instruction is typically provided outside the content classroom. Content literacy (general literacy skills and strategies that support reading and writing to learn in all subjects) and disciplinary literacy (specialized reading and writing strategies unique to subject areas) are integrated into content instruction as Tier I instruction.

Figure 2

| | | |
|----------------------------------|--|---|
| Disciplinary Literacy | advanced reading and writing to learn <i>specialized reading strategies unique to subject areas</i> | TIER I Provide accommodations, modifications, scaffolds that ensure students who struggle with literacy skills can access the same essential content knowledge as students with grade-level skills. |
| Content Literacy | listening, speaking, reading, and writing to learn <i>vocabulary, comprehension, and writing strategies used across all subjects</i> | |
| Basic Literacy | learning basic listening, speaking, reading, and writing skills <i>intervention for word study, fluency, vocabulary, comprehension, basic writing skills</i> | TIER II & III Remediate to develop basic skills. |

Sedita, J. (2021). Adolescent literacy: Components of literacy in an MTSS model. Keys to Literacy.

Examples of Disciplinary Literacy

What is required for disciplinary literacy in different subjects? View the examples below of discipline-specific requirements, skills and strategies (Schoenback & Greenleaf, 2009; C. Shanahan, 2015; Lent, 2017).

History

Experts in history interpret primary and secondary sources, corroborate sources, and use the past as a prelude to the future. They analyze historical documents, attending to bias and perspective, and evaluate the credibility of different sources of information. They also construct evidence-based accounts of probable historical events.

Mathematics

Experts in mathematics decipher mathematical notation in the form of symbols and Greek alphabet letters that represent math concepts. They process abstract ideas, estimate, and generalize. They also understand specialized vocabulary, including words that have different meanings in mathematics than in everyday use (e.g., *plane*, *product*, *expression*, *operation*, *problem*).

Science

Experts in science participate in scientific exploration and reasoning. They interpret data, charts, models, illustrations, and lab notes. They also conduct experiments and systematic observations, consider new hypotheses or evidence, and read and write scientific explanations.

English: Literary Works

Experts in literary study read closely and examine texts in multiple genres. They recognize literary devices such as *hyperbole* and *personification*. They also look for metaphors, conflict, and other features of literature to interpret text. This includes interpreting the symbolism in poems, or how a poem's form contributes to its theme.

Differences in Language and Text Structure

The text that is used in different content areas can vary greatly in terms of the language and vocabulary, sentence structure, and overall text structure, as shown in the different high school samples below. An important part of teaching disciplinary literacy is making students aware of what is unique about a piece of content-area text and highlighting how an expert in that discipline would go about reading that text. Teachers, as content experts, can model the mental processes they use as they encounter challenging text through think aloud (verbally describing the thinking process).

Examples of Subject-Specific Text

What do you notice about the language and structures used in the following four examples of high school texts?

History Example

Ming Dynasty

Chinese scholar-officials represented the backbone of the Chinese state and bureaucracy. Unlike Europe, China had no hereditary aristocracy, nor did its merchant class become politically significant as in some European countries. Deriving power and status from their education and high government office, scholar-officials became the most formidable check on the absolute power of the emperor. Scholar-officials gained their place in government by passing rigorous civil service examinations held at the prefecture, provincial and capital levels. Quotas ensured that each province could only send so many worthy candidates to the capital, ensuring no regional dominance in government. The prestige associated with being sent to the capital meant that families who could afford to do so would hire tutors to give their male children an advantage. Based mainly on Confucian texts, the examinations could last for several days. The grueling process of the exams, the writing of essays, the drafting of mock state papers and edicts, and commenting on Confucian texts, coupled with the meager passing rates, ensured that those who advanced would be adept public servants capable of administering the Chinese state.

Language and Structures

- contextualized terminology: *scholar-officials, hereditary aristocracy, merchant class, prefecture, Confucian texts*
- lengthy, complex, final sentence
- text structure: explanatory

Source: Rankin & Weise, 2022

Mathematics Example

Solving Linear Equations – One Step Equations

Objective: Solve one step linear equations by balancing using inverse operations.

Solving linear equations is an important and fundamental skill in algebra. In algebra, we are often presented with a problem where the answer is known, but part of the problem is missing. This missing part of the problem is what we seek to find. An example of such a problem is shown below.

Example 1.

$$4x + 16 = -4$$

Notice the above problem has a missing part, or unknown, that is marked by x . If we are given that the solution to this equation is -5 , it could be plugged into the equation, replacing x with -5 . This is shown in Example 2.

Example 2.

$$\begin{array}{ll} 4(-5) + 16 = -4 & \text{Multiply } 4(-5) \\ -20 + 16 = -4 & \text{Add } -20 + 16 \\ -4 = -4 & \text{True!} \end{array}$$

Now the equation comes out to a true statement! Notice also that if another number, for example, 3, was plugged in, we would not get a true statement as seen in Example 3.

Example 3.

$$\begin{array}{ll} 4(3) + 16 = -4 & \text{Multiply } 4(3) \\ 12 + 16 = -4 & \text{Add } 12 + 16 \\ 28 = -4 & \text{False!} \end{array}$$

Language and Structures

- contextualized terminology and words with meanings different from everyday use: *linear equation, balancing, operations, unknown, solution, plugged into*
- use of symbolic language: +, =, -, ()
- unique visual formatting
- text structure: step-by-step process

Source: Wallace, 2010

Science Example

How can we make antimalarial medicine faster?

A natural medicine against malaria is *artemisinin*. It comes from a plant named *Artemisia annua*. This plant takes a chemical dihydroartemisinic acid (DHAA) and turns it into artemisinin. In this study, we wanted to find out which factors affect how fast artemisinin forms. Could heat, light, the amount of DHAA, or the chemical composition of DHAA hold the key?

Experiment:

We placed samples of DHAA under an infrared light, in a bath of hot oil, and under an ultraviolet light (UV). The samples remained in their environments for 2.5 hours. We also put a sample of artemisinin under the UV lamp for 8 days to see how UV light can affect artemisinin. Then we measured the amount of artemisinin present in each sample using a nuclear magnetic resonance (NMR) spectrometer and a mass spectrometer.

Results:

The UV light sample showed a larger amount of artemisinin compared to the infrared and hot bath samples. But when artemisinin was left under light for 8 days, the amount of artemisinin started to decrease. Instead, we found a chemical that had all the atoms of artemisinin, but in a different arrangement that does not kill the parasite that causes malaria.

Language and Structures

- contextualized terminology: *Artemisia annua, dihydroartemisinic acid (DHAA), infrared light, ultraviolet light, nuclear magnetic resonance (NMR), spectrometer*
- text structure: experimental reporting (purpose, description of experiment, reporting of findings including anomalies)

Source: Arman & Yoshimoto (2021)

Literature Example

The Grapes of Wrath, John Steinbeck

The man took off his dark, stained hat and stood with a curious humility in front of the screen. "Could you see your way to sell us a loaf of bread, ma'am?"

Mae said, "This ain't a grocery store. We got bread to make san'widges."

"I know, ma'am." His humility was insistent. "We need bread and there ain't nothin' for quite a piece, they say."

"'F we sell bread we gonna run out." Mae's tone was faltering.

"We're hungry," the man said.

"Whyn't you buy a san'widge? We got nice san'widges, hamburgs."

"We'd sure admire to do that, ma'am. But we can't. We got to make a dime do all of us." And he said embarrassedly, "We ain't got but a little."

Mae said, "You can't get no loaf a bread for a dime. We only got fifteen-cent loafs."

From behind her Al growled, "God Almighty, Mae, give 'em bread."

"We'll run out 'fore the bread truck comes."

"Run out then, goddamn it," said Al. He looked sullenly down at the potato salad he was mixing.

Mae shrugged her plump shoulders and looked to the truck drivers to show them what she was up against.

She held the screen door open and the man came in, bringing a smell of sweat with him. The boys edged behind him and they went immediately to the candy case and stared in—not with craving or with hope or even with desire, but just with a kind of wonder that such things could be. They were alike in size and their faces were alike. One scratched his dusty ankle with the toe nail of his other foot. The other whispered some soft message and then they straightened their arms so that their clenched fists in the overall pockets showed through the thin blue cloth.

Language and Structures

- use of dialogue to reflect characterization
- use of alternative spellings to reflect dialectal variations in pronunciation
- overall use of language to influence tone
- use of third person relating action as an outside observer with an omniscient perspective
- text structure: narrative exposition

Source: Steinbeck, 1939

Combining Content and Disciplinary Literacy Instruction in Middle and High School Grades

Most literacy experts suggest that it is best for content teachers to combine content literacy and disciplinary literacy; they are not mutually exclusive approaches. Content teachers play an important role in teaching students how general content literacy skills and strategies are used with the specific content and texts within their discipline. This is where content literacy and disciplinary literacy intersect. Students can practice common generic literacy strategies as they are introduced to discipline-specific frameworks and practices. This is especially the case in middle school grades where many students are still learning how to automatically decode and determine the meaning of multisyllabic words derived from Latin and Greek and increasing their overall fluency skills.

Shanahan (2017) explains that general comprehension skills and study strategies are helpful teaching tools that can enhance student learning from text. He notes that content area reading aims to build general literacy skills, while disciplinary literacy tries to get students to grasp the ways literacy is used to create, disseminate, and critique information in the various disciplines.

Disciplinary literacy practices in some ways re-frame general content literacy strategies for more advanced and specific purposes. Burke and Kennedy (2024, p. 642) make this point:

Disciplinary literacy provides a helpful way of thinking about how we can integrate our literacy instruction in a manner that serves our literacy aims while remaining true to the ways of thinking and inquiring that a scientist or artist might adopt.

The guide *Reading in the Disciplines* (Lee and Spratley, 2010, p. 16) suggests a combination of generic reading and discipline specific reading strategies, shown in Figure 3.

Figure 3

| Generic Reading Strategies | Discipline Specific Reading Strategies |
|---|--|
| <ul style="list-style-type: none">• Pre-read.• Set goals.• Think about what one already knows.• Make predictions.• Monitor comprehension.• Ask questions.• Test predictions against the text.• Re-read.• Summarize. | <ul style="list-style-type: none">• Build prior knowledge.• Build specialized vocabulary.• Learn to deconstruct complex sentences.• Use knowledge of text structures and genres to predict main and subordinate ideas.• Map graphic (and mathematical) representations against explanations in the text.• Pose discipline relevant questions.• Compare claims and propositions across texts.• Use norms for reasoning within the discipline (what counts as evidence) to evaluate claims. |

Lee & Spratley, 2020

Consider the Needs of Struggling Adolescents

Some advocates of disciplinary literacy view content literacy as something significantly different from disciplinary literacy, and that content teachers should focus only on the latter. Given the deep research base supporting the use of general, content strategies for reading and writing across disciplines, a focus on just disciplinary instruction hinders discussion about how to blend both approaches to effectively teach students with varying degrees of literacy proficiency in content classrooms. This is especially the case for large numbers of adolescent students in today's schools who have not developed basic literacy skills, most of whom spend the majority of their time in regular classrooms (Fagella-Luby et al., 2012; Brozo et al., 2013) and for some English learners who have not developed sophisticated vocabulary and language skills.

The International Literacy notes (2017, p. 4):

Several studies conducted across multiple content areas have demonstrated that disciplinary literacy instruction can lead to positive outcomes for diverse students on measurements of content knowledge and literacy achievement. However, some scholars have cautioned that this approach alone does not adequately support students who experience difficulties with reading or writing. They assert that students also deserve explicit instruction on basic reading and writing processes in each discipline.

Fagella-Luby and colleagues (2012, p. 76) examined the research base related to discipline-specific strategies and struggling adolescent learners and found the following:

Of more than 150 articles examined on reading and writing strategy instruction involving struggling adolescent learners, only 12 involved any methods that could be coded as offering discipline-specific strategy instruction. These results support a conclusion that reasoning for a disciplinary framework precedes the necessary evidence base. Moreover, as only 1 of the 12 studies involved content other than reading and writing related to literature, research on outcomes for struggling learners with discipline-specific strategies in core subjects (i.e., science, mathematics, and social studies) is desperately wanting.

They suggest that content teachers should bear some responsibility for teaching general content strategies, and make the following points:

Although the disciplinary literacy framework is appealing, regrettably it fails to consider the academic diversity in today's schools in which a majority of students have yet to master the necessary prerequisite skills for discipline-specific instruction. (p. 70)

Although the rationality of developing discipline-specific strategies to improve depth of content area knowledge is clear, replacing general strategy instruction wholly with discipline-specific strategies in high schools at this time is not practical, grounded in a literature base, nor likely to meet the realistic needs of a majority of students. ... it is unlikely that adolescents who struggle, who constitute a majority of students, will be able to master disciplinary literacy skills without the necessary prerequisite literacy building blocks that are embodied in general strategy instruction. (p. 81)

Brozo and colleagues (2013, p. 354) make a similar point:

Taken together, advocates of this view of disciplinary literacy see as its purpose the development in students of something much more than the ability to read and write in the disciplines. Their idea is that students should “become” members of a disciplinary culture. Although that is a desirable outcome for students interested in specializing in a discipline, we are not convinced this should be the goal of content area instruction for all students. We are especially concerned, moreover, about what a disciplinary curriculum might mean for struggling adolescent readers.

Reading Motivation and Engagement

There is strong evidence that students' motivation and interest in reading school-related texts declines after they move from elementary to middle school, and this is particularly true for students who have difficulty with reading. Students with low motivation and interest in reading do not read as much as students with stronger motivation. This lack of reading affects the maintenance of fluency, the growth of vocabulary, and effective reading strategies needed to learn from text. This in turn limits their ability to learn in all content areas. (Torgesen et al., 2007; Kamil et al., 2008)

Adolescent struggling readers often lack the motivation to read in school because they face increasingly difficult reading material and classroom environments that tend to deemphasize the importance of fostering motivation to read (Guthrie & Davis, 2003; Murray et al., 2010). They may engage with reading as a passive process without giving effortful attention to activating prior knowledge or using reading strategies. They also often have low comprehension of text and may not be interested in exploring content topics through reading. This is in comparison to their peers who are more motivated, proficient readers who interact with text in strategic ways and are more interested about topics in content texts. (Murray et al., 2010; Guthrie & Wigfield, 2000)

Another challenge facing secondary students related to motivation is that during the school day they are expected to develop disciplinary literacy skills for multiple subjects. Every time the bell rings they enter a new content classroom. Students may have varying interests in different subjects, and some may find certain subjects less engaging or more challenging.

For students who are not proficient readers and lack motivation to read, an emphasis on disciplinary literacy does not adequately meet their needs. These students need explicit instruction on content literacy strategies, and in some cases, basic reading skills before they will be motivated to embrace the challenges of reading like an expert in multiple disciplines.

Teaching Content and Disciplinary Literacy

How will students learn content literacy and disciplinary literacy skills and strategies? Middle and high schools do not offer reading classes to most students, and the English language arts or English class is often focused on reading and writing related to literature. Therefore, the task of integrating literacy instruction into content subjects falls on content teachers.

It would be beneficial for content teachers to message to students that learning in their subject area is not just about memorizing information in science and history or doing calculations in math. Instead, they should help students recognize that having proficient reading, writing, listening, and speaking skills

supports learning in their areas of interest and prepares them to succeed in post-secondary education and career, and as productive citizens.

What level of student knowledge and disciplinary sophistication should educators expect across grades 6 through 12? When is it reasonable to expect students to read and write like experts in the field? What specifically changes along a continuum across the grades that progresses from simply introducing what is unique about discipline-specific text in grade 6 to more advanced analysis of text in a high school Advanced Placement Comparative Government or Biology course? Currently there is insufficient research to provide definitive answers, but most likely the answers will vary based on the abilities and needs of individual students.

Teaching disciplinary literacy strategies is challenging. In addition to having limited comprehension strategies, students may lack experience reading lengthy expository text, lack sufficient content specific vocabulary or background knowledge about the topics they encounter in text.

Another challenge is the lack of resources available to teachers to support disciplinary literacy instruction. There are many more resources available for learning how to teach general, content literacy skills. Also, not all secondary teachers have the opportunity to take coursework on literacy instruction before becoming a teacher or participate in professional development once they are in schools. As a result, it is challenging for content teachers to identify for themselves the specific reading, writing, speaking, and listening skills that must be applied to access the content and text they are using in their classes.

Discipline-Specific Instructional Suggestions

Beginning in the middle grades, teachers should strive to adapt general reading practices into more discipline-specific variations. However, they do not have to wait until content literacy skills are fully developed to begin introducing students to disciplinary literacy practices. For example, they can teach students how to review experimental data and write a lab report in science, how to determine the point of view of the author of a primary historical document, or how to determine the theme of poem even if students have not mastered general content strategies such as note taking and summarizing. As students move into high school grades and encounter more sophisticated disciplinary texts, they need more support to learn discipline-specific strategies (Schoenbach and Greenleaf, 2009).

Shanahan (2017) offers the following overall suggestions for supporting disciplinary literacy:

- Reading has to be a big part of students' disciplinary classes. An important part of teaching a subject area should come through text; teachers should not avoid text because it may be hard to read.
- Students in elementary grades should read about different subjects and current events to build stores of knowledge and exposure/practice dealing with content language.
- Students in upper grades need opportunities to access high-quality, disciplinary texts, not just textbooks which tend to report content information, but not from a disciplinary perspective. This includes being able to see information expressed in different forms (e.g., prose, tables, charts, etc.) often within the same text, especially for science.
- Disciplinary instruction should impart the content of the subjects to students, including information about the nature of inquiry. For example, what does it mean to work as a historian, scientist, geographer, mathematician, or literary critic? What do they read and why?

The report *Reading in the Disciplines* (Lee and Spratley, 2010, pp. 16-17) offers the following overall suggestions for teaching content knowledge and reading strategies in tandem:

- Reinforce conceptions of reading as a meaning making process.
- Provide guided support for making sense while students are engaged in acts of reading.
- Shift responsibility for thinking and making sense of texts to students themselves through guided supports in both small and whole group work.
- Sequence discipline specific inquiry tasks and the reading of a range of discipline focused texts in ways that build knowledge and dispositions over time.
- Focus classroom talk on how students make sense of texts and how they use what they learn from texts to carry out discipline specific thinking tasks.
- Provide consistent supports so students experience success and develop or reinforce their sense of efficacy as readers as well as students who value the practices of the disciplines as these are instantiated in authentic classroom tasks.

The report also notes that the most important key to these core practices is creating a culture of high expectations through building routines. Routines help establish students' expectations for what they do, how they do things, and why. As opposed to asking students to read for homework or as a classroom assignment and then simply answer questions when they finish reading, literacy rich content area classrooms include a variety of instructional routines that provide guidance to students before, during, and after reading. These routines may include the teacher modeling how to make sense of the text by thinking aloud their thought processes as they read. It shows the students that even expert readers actively work to make sense of texts and can be confused by texts.

Disciplinary Focus Areas for Each Subject

The International Literacy Association's guide *Disciplinary Literacy Strategies in Content Area Classes* (C. Shanahan, 2015) suggests teaching students to use the following disciplinary literacy practices:

Mathematics: Mathematicians read and write journals, books, proofs, mathematical applications, and other documents. Mathematicians read carefully, evaluating the meaning of each word or symbol, and they apply logic to their reading. Suggested practices:

- Reread.
- Learn the names of variables before reading a formula.
- Read equations with appropriate directionality.
- Learn accurate definitions.
- Detect errors.
- Recognize distracting information.

Science: Scientists read proposals, lab reports, journal articles about experiments, and other documents. When scientists read to understand scientific information, they look for more than just surface understandings. When scientists read with a critical eye, the way they read descriptions of experiments or applications of science, they evaluate that information with scientific methods and accuracy in mind. At times they look for errors the way mathematicians do, and they expect information to be accurately and precisely described. Suggested practices:

- Transform prose to diagrams to equations, and vice versa.
- Write for different audiences and purposes.
- Learn science vocabulary.
- Take notes.
- Understand the language of science (how to interpret sentences or small pieces of text).

History: Historical texts include documentaries, trade books, cartoons, photographs, paintings, artifacts, primary documents, maps, memoirs, audio and video recordings, newspaper articles, textbooks, and anything else that comes from the past or is an interpretation of the past. Historians have sophisticated ways of reading text. Suggested practices:

- Consider source and context.
- Corroborate.
- Analyze the relationships among events.
- Use interpretive frameworks (look at history through different lenses).
- Read multiple genres.
- Understand the language of history (how to interpret sentences or small pieces of text).
- Write history.

Literature: In the study of literature, texts usually consist of novels, short stories, and poetry. The study of literature requires learning the language of literary interpretation, an ability to see patterns within and across texts, and an understanding of the human experience. Suggested practices:

- Read different interpretations of the same text.
- Learn the structure of argument.
- Learn the language of literary criticism.
- Learn how to recognize themes.

Questions to Support Disciplinary Literacy

The CEEDAR Center at the University of Florida organizes universal strategies to support reading comprehension as a series of questions, shown in Figure 4.

Figure 4

Reading in the Disciplines: Questions to Consider

Science

- What are the Latin and Greek roots of the vocabulary?
- What is the meaning of prefixes and suffixes?
- What is the meaning of the scientific signs and symbols?
- What are the relationships among concepts?
- What is the scientific meaning of the vocabulary?
- What are the processes discussed?
- What are the facts I need to note?
- What is the interpretation of the graphs, charts, and formulas?
- What are the functions of the investigation?
- Have the conclusions been corroborated?
- How does this information transform our knowledge?

History: Source Documents

Source the Document

- Who wrote this? What is the author's bias?
- What did the author know? When did he/she know that information?
- When was it written?
- Who is the audience?
- What is the author's purpose?

Contextualize the Document

- What is going on at this time?
- What were people thinking and doing?
- What did people believe?

Summarize the Document

- Who or what was this about?
- What is important about the who or what?

Corroborate/Cross-Check Documents

- Do the documents agree?
- Do they tell the same or different stories?
- Which document is more believable? Why?

Mathematics

- How is the information presented?
- Can I interpret the information?
- What is the specialized meaning of the vocabulary of mathematics?
- Can I explain what the symbols mean, including the symbols from the Greek alphabet?
- What is the underlying logic of the theorem?
- What is the correct form of mathematical communication?
- How can I map mathematical representations against the explanations in the text?
- Where are the errors?

English

- What is the genre or text type?
- How is human agency involved?
- Is knowing about the author important for understanding this text?
- What is the author's purpose?
- What is the author's point of view?
- What are the important elements of the narrative? Who? What? Where? When? Why?
- What is the theme? Where in the text is the theme made evident?
- What is the literal meaning and the implied meaning in the text?

Source: CEEDAR Center

Instructional Suggestions to Support Content Literacy and Disciplinary Literacy

Follow Well-Established, Evidence Based Adolescent Literacy Practices

A growing body of research has developed about what students in middle and high school need to keep growing their literacy skills, why some struggle, and what effective instruction looks like. Much of this research supports instruction related to general content literacy for which content teachers should find opportunities to incorporate in their classrooms. Three seminal practice guides based on meta-analyses of research summarize findings about reading and writing instruction in upper grades. Bulleted recommendations from these guides are provided below.

- *Improving Adolescent Literacy: Effective Classroom and Intervention Practices* (Kamil et al., 2008)
 - Provide explicit vocabulary instruction.
 - Provide direct and explicit comprehension strategy instruction.
 - Provide opportunities for extended discussion of text meaning and interpretation.
 - Increase student motivation and engagement in literacy learning.
 - Make available intensive and individualized interventions for struggling readers that can be provided by trained specialists.
- *Teaching Secondary Students to Write Effectively* (Graham et al., 2016)
 - Explicitly teach appropriate writing strategies.
 - Use a model-practice-reflect instructional cycle to teach writing strategies.
 - Integrate writing and reading to emphasize key writing features.
 - Use assessment of students writing to inform instruction and feedback.
- *Writing to Read: Evidence for How Writing Can Improve Reading* (Graham & Hebert, 2010)
 - Have students write about the texts they read: respond to a text in writing (personal reactions, analyzing and interpreting the text), write summaries, write notes, answer questions about text in writing or create and answer questions in writing about a text.
 - Teach students the writing skills and processes that go into creating a text: the process of writing, text structures, paragraph and sentence construction skills, spelling.
 - Increase how much students write.

Use Explicit Instruction and a Gradual Release of Responsibility Model

The goal is to have students gradually develop content and disciplinary strategies through explicit instruction and guided practice. Students need to be *apprenticed* and mentored (Moje, 2016; Shanahan, 2017), with some requiring more scaffolds than others, until they can eventually read, write, and communicate in an academic discipline. As an apprentice, students need hands-on experience with the help of an insider (the teacher) who knows how to engage them in meaningful disciplinary inquiry and how to teach them to use texts and write about what they are learning. They also need time to practice.

Teacher modeling and use of think-aloud is an essential part of explicit instruction. Content teachers need to recognize their own invisible mental processes as they encounter challenging texts in their disciplines, and then bring students into a community of learners where the teacher's and students' thinking is made visible and available for discussion (Schoenbach and Greenleaf, 2009). Teachers need

to model the cognitive processes they use to read and write about text and provide opportunities for students to discuss how they are using these strategies.

Preview Vocabulary and Provide Background Knowledge

Research has determined that one's knowledge, including academic content knowledge and the cultural knowledge developed through day-to-day activities, affects one's reading comprehension. A student with more expertise in a subject covered in a text will comprehend better than a student who has minimal or no knowledge of the subject. (Hwang & Duke, 2020; Willingham, 2017)

One of the reasons students have difficulty with subject-area text is the lack of background knowledge about the topics in text and the academic vocabulary associated with those topics. There are several things content teachers can do prior to reading a text that will support students (Sedita, 2024B):

Preview Unfamiliar Vocabulary: Prior to reading, the teacher should identify words in the text that might be unfamiliar to students. The goal of previewing is to provide just enough knowledge about words so students do not *stumble* over them while they read rather than deeply teaching the words (Graves, 2006). There are many ways teachers can provide basic information for words in a preview list: provide a visual representation of the word, use the word in a sentence, provide a user-friendly definition, provide synonyms or antonyms, use everyday examples of how the word is used, conduct a discussion about what students already know about the words.

Provide Some Background Knowledge: Even students who have developed significant background knowledge about a lot of topics will encounter text for which they have little or no knowledge. Teachers can provide basic information by sharing a concept map that includes main topics and essential vocabulary, showing a brief video or a series of visuals related to the topic, or reading a brief text passage.

Share the Big Ideas: A basic outline or graphic organizer that presents the topics, subtopics, and main ideas from the text helps students see the big picture of what they are about to read. Prior to reading, the teacher can ask students if they are familiar with any of the topics or main ideas.

Pose Pre-reading Questions: The teacher can pose questions related to the content of the text and ask students to think about finding the answers to these questions as they read. This type of pre-reading activity helps students activate any prior knowledge they have about the text and gives them a focus and purpose for their reading.

Use a Prediction Task: Prediction is a strategy that leads readers to anticipate what the author will reveal. After the teacher provides some information about the text using any of the activities listed above, the teacher asks students to make some predictions about what they think they may learn based on that information. Predicting is a tool readers can apply in certain reading situations, but it can only work if there is some relevant knowledge available. This might be provided by the teacher. (Shanahan, 2023)

Before, During, After Comprehension Strategies

As noted earlier, research has accumulated over decades supporting the use and integration of comprehension strategies into content classrooms. The CEEDAR Center at the University of Florida organizes universal strategies to support reading comprehension into a before, during, and after framework:

Before Reading: set a purpose for reading, preview the text, make predictions, make connections to prior knowledge, note text structure and genre, attend to the author and source information, examine graphics (bold print, tables, graphs, pictures, charts)

During Reading: monitor comprehension, recognize barriers to comprehension, utilize fix-up strategies, define unknown vocabulary words, adjust reading rate, annotate text, form visual images, check accuracy of predictions, ask questions, make inferences, analyze graphics (tables, graphs, pictures, charts), determine important information, paraphrase chunks of text, reread text, check whether the text makes sense, make predictions

After Reading: summarize the text, relate text to prior knowledge, analyze the text, demonstrate understanding of the text, evaluate the text

Incorporate Discussion About Text

One of the five recommendations in the research guide *Improving Adolescent Literacy: Effective Classroom and Intervention Practices* (Kamil et al., 2008) is for teachers to provide opportunities for students to engage in high-quality discussions of the meaning and interpretation of texts in various content areas as one important way to improve reading comprehension.

The report recommends these discussions occur in whole classroom groups or in small student groups under the general guidance of the teacher. Discussions that are particularly effective in promoting students' comprehension of complex text are those that focus on building a deeper understanding of the author's meaning or critically analyzing and perhaps challenging the author's conclusions through reasoning or applying personal experiences and knowledge. In effective discussions, students have the opportunity to have sustained exchanges with the teacher or other students, present and defend individual interpretations and points of view, use text content, background knowledge, and reasoning to support interpretations and conclusions, and listen to the points of view and reasoned arguments of others participating in the discussions. Discussion provides opportunities for students to engage in deeper content learning.

How teachers should carry out the recommendation (Kamil et al., 2009):

- Carefully prepare for the discussion.
- Ask follow-up questions that help provide continuity and extend the discussion.
- Provide a task, or a discussion format, that students can follow when they discuss texts together in small groups.
- Develop and practice the use of a specific "discussion protocol."

Lee and Sprately (2020) recommend classroom talk on how students make sense of texts and how they use what they learn from texts to carry out discipline specific thinking tasks, or what some call

accountable talk (O'Connor, 2012; Michaels et al., 2013). *Accountable Talk* is academically productive talk in which students explain their thinking with evidence and listen and respond constructively to others' ideas. It reveals students' understanding and misunderstanding, boosts memory for content, and supports academic language development and deeper reasoning.

O'Connor (2012) suggests the following *talk moves* students can be taught to use during classroom discussion to support accountable talk:

- Revoicing: Paraphrasing some or all of what students say and asking them to verify if their statement was correct.
- Repeating: Asking students to restate someone else's reasoning.
- Reasoning: Asking students to apply their own reasoning to someone else's statement.
- Adding On: Inviting students to join the discussion.
- Wait Time: Allowing for a few moments of silence after a student has been asked a question.

Analyze Text with Students, Teach Close Reading

Close reading is something readers do to figure out a high-quality, challenging text. It includes an intensive analysis of the text to determine what it says, how it says it, and what it means. It is sometimes referred to as *deep reading*, *critical reading*, *unpacking or dissecting the text*, and *reading like a detective*. During a close reading lesson, teachers demonstrate how to go about reading a text, and students practice close reading strategies using multiple readings, peer discussion, and text-embedded questions. (Sedita, 2020)

Content teachers are in the best position to teach close reading because, as disciplinary experts, they have a unique scientific, historical, mathematical, or literary lens and recognize the challenges related to text in their subject area.

The characteristics of a close reading lesson include:

- It uses a short passage, typically one to several paragraphs.
- It is student centered and includes highly collaborative discussion.
- It combines independent, partner or small group, and whole group activities.
- It uses reading, thinking, and talking during multiple reads.
- It includes text dependent questions.
- It includes the teacher modeling and thinking aloud (sharing verbally) the mental processes they use to read closely.
- It can culminate in a text-based writing task.

Planning a Close Reading Lesson

Selecting Text: Teachers begin developing a close reading lesson by selecting a challenging text passage and determining what about the text is unique to their discipline and what might be particularly difficult for students. The focus areas and objectives for the multiple close readings typically include any of the following (Sedita, 2020):

- challenging vocabulary
- difficult phrasing and sentences
- the author's point of view
- the central or main ideas
- any additional challenging areas of the text

Text Dependent Questions: Close reading lessons are driven by text-dependent questions planned by the teacher ahead of time. These are evidence-based questions that can only be answered by referring explicitly back to the text being read. They should not be based on information extraneous to the text or based on students' personal beliefs. Consider the two questions about the Lincoln's Gettysburg Address. The first is a text-dependent question, while the second is not.

- In the address, what does Lincoln say the living who were there that day should do?
- Lincoln says that the nation is dedicated to the proposition that "all men are created equal." Why do you think equality is an important value to promote?

Text-dependent questions can be related to any of the five focus areas listed above. The teacher develops these questions to be asked at critical junctures in the text. That is, points at which students must decipher the meanings of words, sentences, and inter-sentence connections, as well as consider text structure or make inferences, to understand the text.

Examples of text-dependent questions:

- What does the word _____ mean in the context it appears in the text? Can it be used in a different way?
- Does the author do anything unusual with the language in this sentence?
- What does the figurative language in this phrase mean?
- What is the central idea of this text? Is it stated or implied?
- How does the author develop this central idea?
- What does the text tell us about the author's point of view?
- How might setting be important to this narrative?
- Where does the author state their claim in this argument? Restate the claim in your own words.
- What three reasons does the author give to support this claim?
- Using the map and reading the text, what inferences can you draw as to reasons why _____?

Conducting a Close Reading Lesson: Multiple Reads

During a close reading lesson, students read the text several times (Sedita, 2020). The teacher starts the lesson by stating the purpose(s) for the reading and posing one or two initial questions to help focus the first read.

For the **first read**, students read the full text independently. The goal is for them to become familiar with the text and determine what they are able to understand before interaction with the teacher and peers. As they read, they annotate the text by highlighting what they think are important parts of the text, identifying parts of the text that are difficult, and posing questions.

This independent reading is followed by a partner or small group discussion where the students discuss what they have learned and noticed about the text. Some of the text dependent questions are used to facilitate this discussion.

For the **second read**, the students listen to the teacher read the text aloud, modeling fluent reading and pausing at critical junctures to pose questions and verbally share the mental processes the teacher is using to closely read the text. This includes sharing their wonderings and questions they have related to the text. Students take notes and expand their text annotations as they listen.

For the **third read**, the teacher asks students to read a section of the text that has been identified as a focus area (i.e., vocabulary, challenging phrases or sentences, central idea and key details, author's point of view or purpose, and any additional challenging aspects of the text). The teacher asks students to answer text-dependent questions related to that focus area. Students read the passage with a partner or in a small group and then participate in collaborative discussion about what they gleaned from the text and responses to the questions. This is followed by a whole class discussion facilitated by the teacher where partners or small groups share their responses.

The cycle for the third read is continued for each remaining section of the text.

A close reading lesson can be completed in one lesson, depending on the length of the text and number of focus areas covered in the lesson.

The goal of analyzing text with students and conducting close reading lessons is for students to read complex texts independently. Some students will achieve this goal sooner than others.

Independent Close Reading

Hinchman & Moore (2013, p. 444) suggest students do the following once they are able to independently read closely to learn from texts:

- Read and reread for different purposes (gain an impression of the text's contents and location of information, analyze the text's message) and at different rates (fast, medium, slow).
- Annotate and be an active reader. Take notes about remarkable passage elements, key factual information, and significant ideas in the text. Identify the most important words, phrases, sentences, or paragraphs.
- Summarize – Retell the passage according to its structure.
- Self-explain. Figure out how the ideas and information relate to one another.
- Ask and answer questions about the text.
- Determine the significance of what they notice – figure out why certain ideas and information attract their attention.

School, District, and Teacher Collaboration

To support the implementation of content and disciplinary literacy, schools can conduct a literacy audit to determine how literacy is being taught and integrated in subject area classrooms. A school audit can help recognize and encourage existing practices and develop specific goals for expanding content and disciplinary literacy across subjects.

District-level administrators and literacy leaders can emphasize the value of vertical articulation for content literacy across grades and schools by developing a district-wide curriculum that is consistent and follows a progression of literacy instruction that becomes increasingly more challenging as students move into middle and high school.

Content teachers can collaborate to identify the essential focus areas of disciplinary literacy in their subject area and determine the practical applications of both content and disciplinary literacy instruction. At the middle school level, this collaboration can happen through grade-level teams where educators from different subjects work closely together to align their instruction. At the high school level, this collaboration can happen within subject-area departments.

School and district literacy specialists can join in this teacher collaboration to contribute literacy expertise. This includes how to apply generic reading strategies to content-specific text and writing tasks, and how to support students' wide spectrum of existing basic and content literacy skills. They can also work with disciplinary experts to develop instructional practices and routines for disciplinary literacy in each subject.

Hwang and colleagues (2021, p. 7) suggest peer educators discuss the following questions

- What is unique about your subject discipline in terms of reading, writing, speaking, and listening?
- How do members of this subject discipline use language on a daily basis?
- Are there any typical misconceptions held by students, for example, how to write an effective science report?
- Are there words and phrases used typically, or uniquely, in the subject discipline?

Conclusion

In order to be college and career ready, students need high quality instruction that prepares them as proficient readers and writers across disciplines. Content teachers play an important role in helping students see the relevance in their lives of disciplinary learning, and teaching them the skills and strategies for listening, speaking, reading, and writing in different subjects.

Educators need to first make sure students who enter middle and high school grades have basic, foundational literacy skills such as decoding and spelling, fluency, basic comprehension skills including inferencing, an understanding of text structure, knowledge of basic academic vocabulary, and basic sentence and paragraph writing skills. In an ideal world, Tier I instruction in the elementary grades would ensure that these skills are in place before students enter middle school. However, there are many students in grades 6 to 12 who do not have grade level reading and writing skills. These students should be provided Tier II supplemental or Tier III intervention instruction as soon as possible.

In the middle and high school grades, Tier I core instruction to maintain grade-level literacy skills needs to be integrated in all subjects. This should include a combination of general, content literacy skills and strategies, including comprehension strategies (predicting, note taking, summarizing, question answering and generation, etc.), continuous academic vocabulary growth and strategies for determining the meaning of unfamiliar words, recognition of more complex forms of text structure for both reading and writing, writing critical responses to text, and applying the stages of the writing process. Students should be taught to apply these content literacy strategies to gradually more specialized content reading and writing tasks.

Students also must learn to become skilled in disciplinary literacy, i.e., developmentally appropriate forms of reading, writing, and discussing in history, science, mathematics, literature study, and other academic subjects. Dr. Cynthia Shanahan notes (2015) that students are much more likely to increase their ability to read in different disciplines if they know something about the literacy strategies and practices particularly suited to that discipline. This includes learning how texts function within a discipline and understanding the inquiry frames and purposes that readers bring to texts and other artifacts of the discipline (Goldman, 2012). It also includes advanced writing skills needed to complete specific writing tasks unique to each discipline.

By implementing content and disciplinary literacy instruction, educators can equip students with the literacy strategies necessary to navigate the increasingly complex texts they encounter across content areas in middle school and high school.

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