

## READING & WRITING TO LEARN CONTENT

*Literacy is an activity, a way of thinking not a set of skills. And it is a purposeful activity—people read, write, talk and think about real ideas and information in order to ponder and extend what they know, to communicate with others, to present their points of view, and to understand and be understood (Langer 1987, p 4).*

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## THE RELATIONSHIP OF LITERACY AND LEARNING

As students progress through elementary grades, they move from learning to read and write narrative texts to working with informational texts. Similarly, in this chapter the focus shifts from teaching students to read and write, to using reading and writing to help students learn content concepts and processes. By adapting the literacy practices suggested in this chapter to fit the needs of their classrooms, teachers can lead students to think more critically about informational texts and to apply what they learn to situations outside the classroom.

This chapter is based on the following assumptions about the nature of literacy activities to enhance content learning:

- ▶ **Learning is a human activity.** Learning is a dynamic process rather than a static product, a process where the focus is on the changes that take place in the thinking of the learner during an activity. Teaching is more than dispensing information because learning is more than receiving and remembering information (Brozo & Simpson, 1999).
- ▶ **Learning is a social activity.** Thinking is determined by actions, contexts, and participation in communities. Human learning and literacy activities are functions of cultures. Variations in cultural practices and situational conditions produce variations in ways of

knowing; therefore, human development has no single universal goal and development varies in direction and outcomes (Daniels & Bizar, 1998).

- ▶ **Learning is enhanced by interchanges which are language-based.** Meaning and purpose are integral to all aspects of literacy/learning activities and must be understood in terms of the social interaction involved. Students need to spend a great amount of time working in cooperative relationships with other students to explore alternative perspectives and evaluate ideas. These cooperative relationships help provide meaning and purpose as students communicate and connect to the world outside the classroom. These relationships also establish learning communities in and outside the school setting (Brozo and Simpson, 1999; Daniels & Bizar, 1998; Grabe & Grabe, 2000).
- ▶ **Learning is a process of meaning-making.** Reading, writing and discussion are complementary, constructive and parallel processes that can develop students' thinking. Students build and increase their content knowledge when literacy activities are used as tools for learning. If teachers emphasize the connections between literacy activities, students can also increase their understanding of the relationships among the various content concepts and processes (Brozo & Simpson, 1999, p. 227; Strickland & Strickland, 1993).
- ▶ **Learning is enhanced through self-reflection.** Learning in content areas is directed toward the development of critical thinkers and active independent learners (Ryder & Graves, 1998). In order for this to happen, students need the opportunity to reflect on their own learning and thinking strategies through self- and group- assessment activities designed by the teacher.
- ▶ **Learning is enriched through assessment and feedback.** Assessment is an on-going process in the classroom through which teachers make instructional decisions to increase opportunities for students' learning.

Throughout earlier chapters, the connections between literacy and learning have been emphasized. A recurring theme has been the transactional nature of learning to which students bring prior knowledge, experience, beliefs and attitudes. When content area teachers use reading, writing and discussion to engage their students' social and cultural backgrounds, they create rich classroom contexts for learning. Clearly, schools expect teachers to help students master content, but focusing

on students' passive use of skills and information will not help them develop the practical applications of learning that they will need beyond the classroom walls. The teacher's role in this process is to provide an atmosphere in which students actively and consciously construct useful meaning. Students can also become more aware of their own thinking and learning strategies as they participate in the instructional activities that are discussed in this chapter.

### **The Teacher's Role in Creating a Literacy Environment**

Learning does not occur in isolation, but in the context of social activity. By participating in social activity inside and outside the classroom, students master culturally prescribed ways of speaking, reading, writing and thinking (Dixon-Krause, 1996). Successful teachers take advantage of the social nature of learning and are sensitive to the different dynamics of classroom situations. Key to capitalizing on the differences in classroom situations is the recognition that the presentation of information in a lecture format itself does not necessarily result in the generation of knowledge (Grabe & Grabe, 2000).

The teacher's role is one of designing activities that are authentic and challenging. In addition to helping students generate knowledge, teachers promote critical thinking as they guide student work related to unfamiliar content. Teachers assess students' work so that they can adjust instruction to fit students' needs, often gaining new knowledge along with their students (Grabe & Grabe, 2000). This means that teachers mediate learning as students share knowledge and construct meaning through social interactions (Dixon-Krause, 1996; Miller & Legge, 1999). Teachers attempt to reach the area between students' actual development (the processes and tasks they can perform independently)

and the students' potential development (the processes and tasks they can perform with the assistance of an experienced person). This mediation requires scaffolding or doing some of the work for students until they can do it for themselves (Grabe & Grabe, 2000).

Much of the scaffolding between students' actual and potential development occurs through conversations mediated by the teachers as they help students fill in gaps in understanding (Miller & Legge, 1999). Scaffolding student learning might also include modeling thinking processes, offering reminders, explaining words or concepts that students don't understand, providing (repeating and reinterpreting) clear directions and demonstrating tasks for students. The teacher's role in scaffolding student development is to guide student inquiry and model active learning (Grabe & Grabe, 2000).

Teachers can make learning meaningful and authentic when students are given the opportunity to match new information with their prior knowledge. In order for students to make connections to prior knowledge, they need the opportunity to work collaboratively, take risks, and test their ideas (Strickland & Strickland, 1993). Collaborative work and discussion motivate and extend current thinking processes related to content. This type of collaborative dialogue also helps teachers establish "knowledge-building communities" in their classrooms (Applebee, 2000).

## RECOGNIZING THE LENSES IN TEACHING READING AND WRITING IN THE CONTENT AREAS

### LENS: LANGUAGE BASED PRACTICES: READING AND WRITING TO LEARN

It is through language that we think and learn (Vacca & Rasinsky, 1996). Because language is crucial to learning as a means of representing experience, reading, writing and discussion serve as overlapping actions that can systematically enhance learning in content classrooms (Dewey, 1963). Literacy activities can guide students to build and rebuild mental models of content concepts and processes. The overarching goal of content literacy activities is to help students become active learners (Brozo & Simpson, 1999). As active learners, students ❶ use their prior knowledge in the meaning making process; ❷ understand and use text structure to organize their meaning-making; ❸ think critically about text and create their own elaborations; ❹ are metacognitively aware; and ❺ possess and employ a wide range of reading and learning strategies (Brozo & Simpson, 1999).

Students need abundant opportunities to use reading, writing and discussion as tools for learning (Brozo & Simpson, 1999). These opportunities are more meaningful when students read authentic texts and participate in genuine communication. Students benefit from the opportunity to learn from numerous sources of information including media and technology, but they also need the freedom to represent their learning in various ways. Teachers who include authentic literacy activities that provide students with options for acquiring information and demonstrating their learning encourage students to recognize learning as whole, practical and meaningful (Brozo & Simpson, 1999).

In content classes, students need to participate in activities that direct them to become independent learners and critical thinkers in relation to informational texts. If students are to learn content, they must act on content information through problems and or tasks. The nature of the task determines the way learning will take place. Teachers can shape classroom activities to represent content in ways that will guide students in understanding the thinking processes and methods that are unique to the content. Through the instructional scaffolding that the teacher provides in content literacy activities, students can acquire processes and thinking in the target discipline (Bruner, 1997; Vygotsky, 1962).

## IMPLICATIONS: READING TO LEARN IN CONTENT AREAS

It is useful for content teachers to understand the text structures used by writers in their fields (Allan & Miller, 2000). It is especially important for teachers to know how they can use multiple strategies to improve students' comprehension of informational texts. In Chapter Three, some strategies to improve student comprehension were listed. These strategies apply to informational text in content areas as well.

Classroom activities are crucial to assisting students in developing their awareness of the differences and difficulties in types of informational texts used in mathematics, social studies, science and health. Content teachers can guide students most effectively when they are familiar with the difficulties that students have in understanding these various text structures (Brozo & Simpson, 1999; Daniels & Bizar, 1998). As Dixon-Krause (1996) suggest, content area texts can be difficult for students to read and comprehend because of their overtly factual presentation, density of new ideas, and quantities of information. In spite of these difficulties, content texts are important because they contain the organizational substance of the subject matter to be studied. Content texts are often written in a survey format in order to present a synthesis of agreed-upon information. This survey format can cause students problems as well because important understandings may be missing or glossed over. Designing activities that build from the use of content area texts as resources rather than curriculum guides is important.

According to Roe, et. al., (2000), there are five characteristics that account for the difficulty that a student is likely to encounter when reading a text:

- ▶ Organization and structure
- ▶ The explanation of several concepts at once
- ▶ The clarity and coherence of the explanations
- ▶ The appropriateness for the instructional purpose and students' reading levels
- ▶ The accuracy and consistency of the information

In addition to teacher's familiarization with these characteristics of text, it is important for teachers to learn about students' prior experiences and knowledge. Teachers benefit from having some idea of students' experiences with different types of texts and with the concepts presented in them. Davey (1989) analyzed how content teachers use their textbooks and found that because secondary teachers frequently use textbooks for homework assignments and expect students to read complete textbooks, matching content materials to students' reading abilities and interests is necessary.

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Synthesizing research about text structure, Roe, Stoodt & Burns (2000) identify five major patterns that occur most frequently in the organizational structures of content materials:

- ▶ sequential/ chronological order
- ▶ list structure
- ▶ comparison-contrast
- ▶ cause-effect
- ▶ problem solution and explanation

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Identifying these patterns in different content texts gives students a feeling of control over subject matter and helps them achieve a broader understanding of complex content. Content teachers should begin by having

students identify chronological order and list structure first because they are the simplest structures and the easiest to learn. As students move on to more complex patterns, the following five strategies can help students develop awareness of text patterns in content texts (Horowitz, 1985, Quoted in Roe et al., 2000, p. 288):

- ▶ Provide examples across topics and texts
- ▶ Relate text patterns to real-life experiences
- ▶ Identify signal words and make notes in the margins
- ▶ Make visual representations of text patterns
- ▶ Have students practice writing text patterns

Teachers need to keep in mind that not all informational texts are well organized. Teaching students to create visual organizers can help them comprehend texts that do not have a clearly recognizable structure (Alvermann, 1981). McGee & Richgells (1986) suggest that students can discuss and then revise texts so that the ideas are easier to understand and relationships between ideas are more apparent. Considering the following guidelines taken from the work of Judith Thelen, a teacher educator and former president of IRA, can help teachers use literacy activities to enhance content learning.

### Guidelines For Reading To Learn Content

- ❶ Set up routines that students can count on. Teachers can experiment with building routines from the reading, writing, cooperative, and research/technology activities described throughout this chapter. For example, teachers can use free-writing rather than quizzes as a way for students to respond to passages from text and prepare for discussion.
- ❷ Promote and expect social collaboration in learning. Set up the environment for small-group work and interactions (see section in this chapter on cooperative learning & discussion for more suggestions about small group work).
- ❸ Allow for student choice in some aspects of learning activities. Negotiate the curriculum with students.
- ❹ Model yourself as a learner. Demonstrate what students are expected to do.
- ❺ Teach focus (mini) lessons based on student needs and requests as they arise in class.

## ⑥ Expect self-evaluation.

Table 1 provides content area teachers with a series of suggested activities for Reading to Learn Content based on strategies identified by experts in the field of reading and writing. These strategies include:

- ▶Previewing and Predicting
- ▶Pre-reading Plan
- ▶Purpose Setting Conversations
- ▶Summarize, Reflect, Predict (SRP)
- ▶Graphic Organizers, Concept/Idea Mapping
- ▶Study Guides
- ▶KWL Charts, Discussion or Writing

TABLE 1. READING TO LEARN CONTENT

Strategies	Descriptor/Essential Elements	How Learning Is Addressed	Assessment
<p><b>Previewing and Predicting</b>                      Allan &amp; Miller (2000)                      Ryder &amp; Graves (1998)                      Tierney &amp; Readence (2000)</p>	<p>After quickly previewing text by surveying pictures, titles, headings and/or short passages, students use what they already know to predict what the material is about. Class discussion can center on students' abilities to elaborate their positions using past experience and evidence from their preview of the text.</p>	<p>Previewing enables students to focus attention on important concepts, arouse curiosity, activate prior knowledge, imagine a purpose for reading and develop expectations. Helps students become more actively aware of important aspects of text. Prediction can also draw students' attention to key concepts, familiarize them with those concepts and encourage hypothesis and connection-making.</p>	<p>Teachers have a sense of students' prior knowledge, interests and initial understanding. Teachers can plan to fill in gaps in student knowledge.</p>
<p><b>Pre-reading Plan (PreP)</b>                      Langer (1982)                      Ryder &amp; Graves (1998)                      Tierney &amp; Readence (2000)</p>	<p>PreP is similar to previewing activities in that it takes place prior to reading. In PreP, the teacher asks students to make association with key concepts in the reading. After each concept is presented in the form of a word, a picture, or a phrase, students talk about initial associations with concepts. Teachers probe students to elaborate and justify their responses. Based on these associations, teachers prepare students for reading by filling in gaps in background knowledge. Next, students reflect on initial associations.</p>	<p>PreP assists students in activating and building awareness of prior knowledge and constructing new knowledge.</p>	<p>Teachers analyze the associations and reflections that students make during discussion and prepare for study by developing students' background knowledge and teaching new concepts.</p>
<p><b>Purpose Setting Conversations</b>                      Ryder &amp; Graves (1998)                      Tierney &amp; Readence (2000)</p>	<p>The teacher presents the central idea or objective for reading text. Students then skim text with this objective in mind. Next, through guided discussion the teacher moves students to talk about the central ideas of the text and generate purpose-setting questions or tasks.</p>	<p>Purpose setting motivates students to read and directs their thinking and comprehension toward instructional objectives. It also provides motivation to go beyond the text and research related concepts and ideas.</p>	<p>Teachers can check levels of students' prior knowledge and comprehension in relation to target ideas or concepts. Teachers can also evaluate students' participation and ability to make connections to past classroom activities and experiences.</p>

TABLE 1. READING TO LEARN CONTENT

Strategies	Descriptor/Essential Elements	How Learning Is Addressed	Assessment
<p><b>Summary, Reflect, Predict (SRP)</b></p> <p>Fulwiler (1987) Ryder &amp; Graves (1998) Tierney &amp; Readence (2000)</p>	<p>Although students can take the responsibility for summarizing parts of the text, in SRP activities, most often it is the teacher who presents a summary of the reading and then guides students through reflecting about the information. This reflection includes asking students to speculate about what they do and do not know about the information, why the information is important and what they still need to learn. This helps students to understand the purpose and key ideas related to readings. Also, it provides opportunities for them to select, connect and organize ideas (and to see that there is more than one way to do this). SRP activities can be done individually or collaboratively and can be either oral or written and prove valuable during reading (in relation to chunks of text) and after reading.</p>	<p>In addition to helping students retain reading materials, when teachers write parts of SRPs they can model the thinking involved for students. When students write their own summaries, they gain practice writing informational text, reflecting and developing audience awareness.</p>	<p>Teachers have information about students' background knowledge, interests and experiences. SRP can also help teachers assess comprehension and writing abilities. It allows teachers to re-design activities to work with students' misconceptions about content and guide them to read carefully.</p>
<p><b>Graphic Organizers &amp; Idea or Concept Mapping</b></p> <p>Allan &amp; Miller (2000) Brozo &amp; Simpson (1999) Roe, Stoodt &amp; Burns (1998) Ryder &amp; Graves (1998) Tierney &amp; Readence (2000)</p>	<p>Teachers or students represent ideas and concepts from the text visually. These activities focus on the depiction of relationships among ideas and can be used before, during and after reading. These activities can also be used to depict relationships among important ideas that emerge from classroom discussion.</p>	<p>Graphic organizers and mapping help students analyze ideas in texts and the relationships between ideas. They also show students how ideas can be represented and related in different ways.</p>	<p>When students create their own graphic organizers or maps, teachers can check for comprehension and work with "bugs" in students' understanding of concepts and relationships among ideas. When teachers design visuals to help students understand ideas in the text, they can use student response to fill in gaps in prior knowledge and to highlight connections to past learning.</p>

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<p><b>Study Guides</b></p> <p>Allan &amp; Miller (2000)                      Brozo &amp; Simpson (1999)                      Ryder &amp; Graves (1998)                      Tierney &amp; Readence (2000)</p>	<p>Study guides focus students on key concepts or aspects of the text and avoid concentration on nonessential information. Study guides can also lead students through various parts of processes related to classroom projects or activities. Students may need direction as to the purpose of the guide. They may also need support in learning how to use study guides. In order to be most useful, students should have the opportunity to collaborate and discuss their responses to study guides.</p>	<p>Students recover information themselves and see how concepts in texts are represented and related. Students also learn how to follow directions. Through directing students to ideas that they may have missed in their reading, study guides can help students become more aware of their own reading strategies. Study guides also help students to fill in gaps in background knowledge and encourages connections to prior learning.</p>	<p>Teachers can use student responses to study guides to review and to plan for future instruction. Students can collaboratively generate their own study guides and teach each other.</p>
<p><b>KWL Charts, Discussion or Writing</b></p> <p>Ogle, (1986, 1996)                      Ryder &amp; Graves (1998)                      Tierney (2000)</p>	<p>KWL emphasizes what students KNOW, what they WANT to know, and what they have LEARNED. Students can write in response to KWL questions in their journals or talk about the three parts in small or whole group conversations.</p>	<p>KWL stimulates active reading and encourages students to connect prior knowledge and imagine what they would like to learn. It enhances comprehension and learning.</p>	<p>KWL familiarizes teachers with students' experience with target concepts and ideas. It allows teachers to work from various levels of student understanding. KWLs also encourage students to reflectively assess their learning.</p>

## IMPLICATIONS: WRITING TO LEARN IN CONTENT AREAS

Writing facilitates learning by helping students explore, clarify, and think deeply about the ideas and concepts they encounter in reading (Vacca & Vacca, 1999). As defined here, writing includes note-taking, list making, memos, letter writing, essay answers, artistic or narrative writing and any type of activity that involves representing thoughts or ideas in print. Daniels & Bizar (1998) assert that writing is also a way of acting on information. As such, writing is part of the process of building knowledge in the classroom community.

Writing can be used to prepare students for reading and learning about content concepts. It provides students with the opportunity to "bridge the gap" between their own language and the conventions of the language of experts in the content community (Strickland & Strickland, 1993). While students question, connect, and apply their observations through writing, they discover vocabulary, ways of gathering evidence, structures of argument and forms for representing ideas that are unique to each content area (Strickland & Strickland, 1993). Writing also encourages students to think critically and provides teachers a valuable way to assess students' thinking.

Although some theorists stress the importance of out-of-class writing, it is just as important to provide students opportunities for well coached in-class writing (Daniels & Bizar, 1998, Atwell, 1998). One way to accomplish this is through workshops. Crucial to these workshops is understanding that writing is a process of discovering ideas and that students need to feel comfortable sharing their ideas and responding to the work of others.

Depending on the purpose for using writing to learn, teachers can give students some degree of choice when working with informational writing topics. Students benefit most from

writing when they have sustained periods of time to work through multiple drafts and elicit response from one another and the teacher. When writing is considered as an "improvable object" (Haneda & Wells, 2000, p. 432), teachers can help students understand that revising consists of modifying a piece of writing to make it clearer and more powerful, not simply more "correct."

Haneda & Wells (2000) make two suggestions for the teacher who wants to use writing as a means of building knowledge. First, the writing that students do should serve a purpose in the life of the classroom. The aim of this type of writing is for all concerned to achieve a richer understanding of what is at issue. Writing used this way is part of an ongoing dialogue, and students understand that their writing will be responded to accordingly not just by the teacher but also by others who share their interests. Haneda & Wells also stress that writing to learn in this way is concerned primarily with discovering and developing meaning in dialogue. Issues of organization and convention are not neglected, but first considered in terms of their function in clarifying meaning (Haneda & Wells, 2000, p. 432).

### Guidelines for Using Writing to Learn in Content Classrooms

- 1 Identify what is important for students to learn and consider whether writing is the appropriate strategy for learning this process or concept (Brozo & Simpson, 1999).
- 2 Vary the forms of writing to encourage active learning. Consider providing students with different ways to represent their learning. Students need different types of assignments to allow them to express their thinking in informal and formal ways (Brozo & Simpson, 233).

- ③ Keep the content of the students' writing—what they are saying—as the central focus. Treat the form of the writing—how they say it—after dealing with the content.
- ④ Design writing activities to help students review, question, organize and relate their developing knowledge to what they have learned previously. Also, provide opportunities for students to write in order to record, recall and reflect on ideas from their reading (Ryder & Graves 1998).
- ⑤ Make peer response a frequent activity. Remember, though, that students need to be instructed on how to respond constructively to each other's writing.
- ⑥ Give students varied audiences for their writing. Technology can help students expand their sense of audience through the use of e-mail, attachments and hard copies to peer edit and proof their own work and that of peers. These activities can foster writing relationships through technology (Daniels & Bizar, 1998).
- ⑦ Provide sufficient time for all writing activities. When students are doing formal writing assignments, provide them with time to engage in the full writing process—prewriting, drafting, and revising. Students benefit more from dialogue, assistance and feedback before turning in their final papers for a grade rather than after.
- ⑧ Differentiate between revising and editing, and make revising the students' first concern. Revising consists of modifying a piece of writing to make it clearer, more powerful, more gripping, more interesting. Editing consists of making sure that the conventions of spelling, punctuation, and usage are correct.
- ⑨ Throughout the process, use assessment as an opportunity to further students' thinking and to help them understand the conventions of the content area. Providing students with criteria for evaluating their writing according to the purpose of the assignments and the conventions of content is valuable. Giving students the opportunity to assess their own work and the work of others prior to teacher assessment can also further their thinking and understanding of content.
- ⑩ "Publish and celebrate students' writing" (Brozo & Simpson, p. 233).

Table 2 provides a series of suggestions to aid content area teachers in using writing to learn content. These activities include: Free and Guided Writing, Reading and Writing Workshop, Learning Logs and Dialogue Journals, Electronic Communication and Multi-Genre Writing.

TABLE 2. WRITING TO LEARN CONTENT

Activity/Key Reference	Descriptor/Essential Elements	How Learning Is Addressed	Assessment
<p><b>Free Writing &amp; Guided Writing</b></p> <p>Elbow (1981) Ryder &amp; Graves (1998) Tierney &amp; Readence (2000)</p>	<p>Teachers provide topics or questions related to readings or classroom activities. Depending on the nature of the prompt, students have various degrees of freedom in responding to prompts. A key element of these activities is that students concentrate on ideas and write "freely" in language that is comfortable for them without concern for conventions.</p>	<p>Writing activates students' memory of learning experiences and encourages questioning. Students make connections from the focus topic to prior learning.</p>	<p>This writing shows students' interests and experiences with target topics or ideas and provides teachers with a sense of how students are responding to reading and classroom activities so that instruction can be revised to fill in the gaps in prior knowledge and address student questions. Because this type of writing focuses on expression of ideas, teachers can "see" student thinking.</p>
<p><b>Reading and Writing Workshop</b></p> <p>Atwell (1987, 1998) Daniels &amp; Bizar (1998)</p>	<p>Teachers encourage students to read, respond and write about the self-selected reading and writing that they do. A key element of reading/writing workshop is student selection; however, teachers need to provide structure and guidance. Reading and writing skills are reinforced as students collaborate in discussion by sharing responses to the reading and the writing generated by group members. Community building is as important as is making expectations clear.</p>	<p>Students learn to work together and to take each others' ideas seriously. Because there is an element of choice, students move from their interests to research possibilities for readings related to content. They also make personal connections to the texts they choose and relate new learning to prior knowledge and experience. Workshops can also give students a broader concept of audience.</p>	<p>Teachers can show students how to respond to each others' ideas constructively. Teachers can also use conferences to work with students' individual needs. When students need direction, teachers conduct focus lessons during workshop. Teachers can manage and assess various aspects of workshops by designing reflective activities for students and using checklists to ensure that students progress through the different levels of work.</p>

TABLE 2. WRITING TO LEARN CONTENT

Activity/Key Reference	Descriptor/Essential Elements	How Learning Is Addressed	Assessment
<p><b>Learning Logs and Dialogue Journals</b></p> <p>Calkins (1986) Fulwiler (1987)</p>	<p>Teachers direct students to explore and record ideas and important events related to classroom activities. Additionally students can respond to their reading, explain or relate concepts, and reflect on what they have learned.</p>	<p>Logs and journals help students focus on important ideas related to what they are studying and to organize their thoughts, questions, and personal feelings.</p>	<p>Teachers can assess students' changing understanding of content concepts in relation to reading and classroom activities. Teachers can respond individually to this type of writing to encourage students to think in different ways about content. Peer response activities that focus on asking questions and making connections can lighten the paper load for teachers and provide topics for discussion.</p>
<p><b>Electronic Communication (E-mail, Chat rooms, Web Site Construction)</b></p> <p>Grabe &amp; Grabe (2000) Allan &amp; Millter (2000)</p>	<p>Students initiate inquiry and discover ways of communicating with on-line sources.</p>	<p>Electronic sources work from student interest and develop students problem-solving and abilities to use technology as well as helping them consider the needs of different audiences. They provide students with feedback from various responders.</p>	<p>Teachers can assess student interest and technical needs. Assistance can be provided in locating and using sources. Teachers have the opportunity to address appropriate ways and conventions for conducting searches and communicating on the internet.</p>
<p><b>Multi-genre Writing</b></p> <p>Allan &amp; Miller (2000) Chiseri-strater &amp; Sunstein (1997) Romano (1995) Bishop (1997)</p>	<p>After the teacher models or presents different ways for students to represent their responses to classroom activities or texts, students select the form that they think best expresses what they are trying to communicate. Multi-genre writing encourages students to transform information into expressive forms. Romano offers an approach where students begin with researching topics, recording their learning in journals and then experimenting with different genres to represent what they have discovered. The final multi-genre paper allows students to put together different genre pieces to show different perspectives or aspects of what they have learned.</p>	<p>Multi-genre writing encourages students to connect feelings and ideas and to assume ownership of the product. This type of writing is challenging because students are not given a fixed format but must make decisions about how best to express what they want to communicate. Multi-genre writing helps students to develop connections across ideas, classes and their own experience in unique ways. Students who have difficulty expressing their ideas in formal academic writing may discover hidden strengths. Multi-genre writing also encourages risk-taking and experimentation.</p>	<p>Multi-genre writing can be assessed according to the requirements of the assignment or project. One aspect that teachers consider in assessing this type of writing has to do with how well a piece represents ideas to inform or persuade an audience. Teachers can evaluate student strengths and push them to see things from different perspectives. Multi-genre writing also encourages teachers to examine instructional options and learn from students.</p>

## LENS: Social PRACTICES: Discussion and Collaboration

*The process of becoming literate is inherently social in nature, even though it is individuals who read and write. Literacy events do not take place in isolation, but in relation to a discourse community of which the reader or writer is, or wishes to become a member. It follows, therefore, that the literate practices and values that individuals develop depend on the purposes for reading and writing that they encounter in home, school, and community activities; where these differ, or even more when they are in conflict, the process of becoming literate is rendered increasingly difficult (Haneda & Wells, 2000, p. 432).*

Current theories of learning are supported by the idea that all learning is social. Vygotsky (1981) emphasized that language and all other learning is centered in social activity and that all higher mental functions are internalized social relationships (p. 164). Through active participation in communities inside and outside the classroom, students acquire ways of thinking, skills, and conceptual understanding. The dynamic social and intellectual aspects of classrooms can help students make connections across texts, reflect on their own thinking and become more critical readers and writers (Brozo & Simpson, 1999; Ryder & Graves, 1998; Dixon-Krause, 1996). When the terms "collaborative" and "cooperative" are used in the sections that follow, both refer to situations where all students contribute and actively help each other learn (Grabe & Grabe, 2000).

## Implications: Cooperation/Collaboration

Students need to learn the processes of cooperating and forming a classroom community. Teachers can help by encouraging a cooperative atmosphere in their classrooms. Developing a **classroom community** enables students to learn in context through group interaction. In fact, studies have found that students learn as much from context-bound discussions with teachers and peers as they do from direct instruction (Wilhelm & Edmiston, 1998). When the content classroom is conceptualized as a social and cooperative community, there is a sense of the commonality of purpose and interest, a sense that students share some of the responsibility for communicating, negotiating and resolving conflict (Daniels & Bizar, 1998). The talking, questioning, and development of strategies in this type of cooperative classroom leads students to more reflective thinking. Because of the summary and checking for understanding that is necessary to communicate ideas, students teach others reciprocally (Palinscar & Brown, 1986); they also become more sensitive to language use. Collaborative activities are driven by student interest. Because of this interest and investment, students learn better. Ultimately they become more comfortable with asking other members of the group and learning from each other (Ryder & Graves, 1998).

According to Daniels and Bizar (1998), successful cooperative activities have "solid procedures for making groups productive" . These procedures involve community building, structure, preparation, management and troubleshooting on the part of the teacher. In addition to structure, Daniels (1994) proposes three essentials for cooperative groups. First, teachers need to explain to students what the desired project or outcome of the groups' work should look or sound like. Secondly, students

need the opportunity to work together on the process that will attain the desired outcome or project. Finally, students need to reflect on the group process and what they learned from working together.

A crucial aspect of the collaborative classroom is **small group discussion**. As Vacca and Vacca (1999, p. 212) observe, "Talk is the bridge to literacy and learning across the curriculum." It is through the power of talk that students are able to transcend the information encountered in text and transform it. When students work together on a group project, they must talk about course content related to the project. Not only do students learn from the process of trying to communicate their own ideas to group members, they also acquire knowledge from one another. Because all group members may not agree with each other or share the same perspective on the task, the group process produces a challenge to the personal knowledge of group members and encourages more active, self-regulated learning (Grabe & Grabe, 2000). "Talking to learn helps students explore, clarify, and think about concepts they encounter in reading and writing" (Vacca & Vacca, 1999, p. 213). The teacher's role in these activities is to observe and participate when necessary.

Teachers can design cooperative activities so that students focus on a problem, explore a topic, play a game or complete a group chosen project or research. In order for students to benefit most from cooperative activities, they need to have some idea of the purpose and focus of the work. When their purpose is clear, students are more likely to participate in small group discussion and to listen to the ideas of others. The classroom should be a place where students feel free to express their thinking and pose questions or present alternative perspectives on ideas. Teachers play a part in these activities as directors who keep the work focused on the purpose and push for alternative perspectives.

Allan and Miller (2000) refer to the type of small group conversation that challenges students to reconsider their thinking about concept issues and problems as "peer-led" discussion. The peer-led discussion that occurs during cooperative activities promotes the thinking abilities of learners to define, clarify, qualify, elaborate, analyze and order their experiences, concepts, opinions or ideas. All of these abilities are crucial to real content learning.

In addition to careful building of community and focus on increasing students' abilities to help each other learn through discussion, most successful cooperative activities require **careful preparation and monitoring by the teacher**. The care taken in structuring cooperative activities is well worth teachers' efforts because students learn differently by interacting with each other, they construct meaning more actively, and they can find it more comfortable to talk and listen in a small group; therefore they gain more practice at expressing themselves than in whole group discussion. Ultimately, students build from sharing their knowledge and gaining knowledge from others as they work together and accomplish content area goals and objectives (Allan & Miller, 2000).

### Guidelines for Cooperative Activities

- ① Show students the need for cooperative learning (Ryder & Graves, 1998).
- ② Allow students plenty of time developing and working in cooperative relationships with other students to explore alternative perspectives and evaluate ideas. Give students abundant opportunities to work together with classmates on different projects (Grabe & Grabe, 2000).
- ③ Provide learning experiences that encourage communication with and access to real world resources (Grabe & Grabe, 2000).
- ④ Students need to be provided a clear definition of the task before discussion and cooperative activities begin so that the work will be productive. They also need direction to regulate their on-task production (Allan & Miller, 2000).
- ⑤ Debriefing should occur at the end of peer led discussion so that each group can assess its process. Build time for debriefing and reflection into all cooperative activities and peer-led discussions. Ensure that students reflect on their group's process and dialogue

about their strategies and decisions as part of this processing (Allan & Miller, 2000).

Table 3 provides a series of Cooperative and Collaborative Learning Activities.

- ▶ Partnering and Think-Pair-Share
- ▶ Drama
- ▶ Informal Small Group Discussion

TABLE 3. COOPERATIVE AND COLLABORATIVE LEARNING

Strategies	Descriptor/Essential Elements	How Learning Is Addressed	Assessment Suggestions
<p><b>Partnering and Think-Pair-Share</b></p> <p>Calkins (1986, 1994*)                      Daniels (1994)                      Fulwiler (1987)                      Lyman ( * )                      Slavin (1990, 1994*)</p>	<p>Students respond to a focus question or topic related to content and then share their ideas in writing or orally with a partner. Partners then share their ideas with the whole group.</p>	<p>Sharing in pairs first allows students to get comfortable expressing their ideas. When students respond in writing, it also helps them consider audience. Students benefit from hearing other's perspectives. Students learn that their thinking is taken seriously.</p>	<p>Teachers can use shared responses to analyze student understanding before, during and after teaching concepts. Teachers can also build from various student responses to scaffold for future learning and model thinking processes.</p>
<p><b>Drama</b></p> <p>Wilhelm &amp; Edmiston (1998)                      Heathcote &amp; Bolton (1995)                      Moffett &amp; Wagner (1992)                      O'Neill (1998, 1982)</p>	<p>Drama helps students to generate and experience mental images of concepts and situations. In drama teachers place students in roles in various imaginative situations and contexts connected to content and the world outside the classroom. Unlike theater, the significance of classroom drama is not in the performance. When used as a collaborative learning activity, the most important element of drama is the debriefing. In debriefing drama activities the teacher guides students to reflect on the meaning of the shared experience. Another common element of drama is that students perform "in role" as other people and characters. This encourages exploration and play with ideas. The possibilities for using drama are endless:</p>	<p>In drama students create mental models to "bring the text to life." This can help them in comprehension of texts, concepts and relationships. Because of the reflective debriefings, students can also learn the value of multiple perspectives on experience and learn the complexity of situations in texts and in the real world.</p>	<p>Teachers assess drama through observation and participation in debriefing conversations. Drama, like writing, can make students' thinking visible and enable teachers to see the world as their students do. Students can also create products—video-tapes, multi-genre writing, multi-media presentations or reflective papers in response to drama activities.</p>

TABLE 3. COOPERATIVE AND COLLABORATIVE LEARNING

Strategies	Descriptor/Essential Elements	How Learning Is Addressed	Assessment Suggestions
<b>Drama (cont'd)</b>	readers-theater, role-play, pantomime, enactment, improvisation, sensory exercises, story-telling and inquiry. Teachers can also design writing activities connected to drama ( asking students to write as a famous historical figure, scientist, mathematician or character from a story.		
<b>Informal Small Group Discussion</b> Allan & Miller (2000) Daniels & Bizar (1998) Moffett & Wagner (1992)	Groups work together to interpret material following teacher instruction or to make decisions about class projects. Teachers can also pose situations or problems for discussion that extend concept application to the world outside the classroom. Depending on the students' experience and context, teachers provide different degrees of structure for group discussion. One valuable way to prepare students for discussion is freewriting. The teacher can ask the student to write on the focus of discussion prior to group work.	Students promote each other's learning through encouragement and assistance; develop interpersonal skills; learn through teaching and collaboration. Discussion promotes self-directed learning.	When introducing students to small group discussion, the teacher may monitor conversations and invite all members to contribute. Observing group talk allows the teacher to deal with questions and misunderstandings that students have. Students can report the results of their discussion to the whole group or represent their work in the form of writing, visuals, or drama. Observing students in various phases of discussion activities provides teachers with insight into students' background knowledge and interests.

## LENS: Meaning-Making PRACTICES: Research and Technology

Scholes (1999) maintains that students need to learn what thinking and reasoning mean in different disciplines. Students also need to recognize and understand the processes for making meaning that are similar and different in relation to context and content knowledge. Research activities can provide students with a means to explore how the methods for making meaning vary according to discipline and situation. One way for teachers to build from students' interests and extend students' prior knowledge is the design of authentic research activities. Authentic activities, those which relate directly to the world outside the school, prepare students for their lives after school and help them recognize the worth of their studies. Authentic approaches to instruction reinforce connections between the classroom and the community. Because authentic activities are often motivating and meaningful to students, they invest more and use a stronger voice in their writing (Wilhelm & Edmiston 1998).

Authentic research activities also demand critical thinking in reasoning through complicated, messy and persistent everyday problems that have consequences that matter. The critical thinking demanded in these types of research activities requires the ability to draw on or recognize information obtained from various sources, but it also requires decisions that direct the inquiry processes. Authentic research activities are novel and often feature cooperative learning, analysis of the process of problem-solving, and the use of multiple sources of information (Ryder & Graves, 1998). These types of activities allow for wide variety of student responses and emphasize reflection. Authentic research activities can encourage students to recognize what they already know so that they can formulate genuine questions, take risks and test their ideas as they explore a variety of informational texts.

Grabe and Grabe (2000) describe two requirements for authentic research activities: culture of practice and primary sources. **Culture of practice** means that students apply content-area-knowledge to the type of tasks which real workers use in their work. When instructional tasks reflect the culture of practice, students work at the things real mathematicians, historians, social workers, chemists or biologists do. These types of tasks also encourage students to collaborate with people and resources beyond the classroom.

**Primary sources** are the raw data or information that students act on in order to produce personal knowledge. Primary sources are materials that have not been “preprocessed” for students, materials that have not been interpreted by someone else (Grabe & Grabe, 2000). Some examples of primary sources are: people, historical documents, data generated by student experiments, films, television shows, popular magazines, artwork, song lyrics, posters, ads, maps, photographs, web pages and other internet sources that are not specifically designed for instructional purposes. “Primary sources often make history, science, or mathematics come alive through their descriptions and their documentation of real people’s everyday endeavors” (Allan & Miller, 2000). Using primary sources can benefit students because they have the opportunity to generate their own interpretations of them as data (Grabe & Grabe, 2000).

## **IMPLICATIONS: RESEARCH/TECHNOLOGY**

Research activities can complement and supplement the content curriculum. Teachers can choose specific topics related to curriculum in order to help students assemble known facts and interpretations to gain or extend their knowledge related to content. When students participate in research activities that focus on investigating a problem or issue related to content, they also learn strategies and gain expertise in conducting inquiry so that they can learn content on their own (Allan & Miller, 2000). Research enhances learning in content classrooms by providing students with opportunities to acquire information independently and to work through authentic problems.

Students’ natural curiosity and concerns can lead to active inquiry, which strengthens

their research skills. In authentic research activities, students move from information-gathering and synthesis of others’ ideas to making decisions about complex questions. One characteristic of these activities is that they come from real questions—questions posed by students or teachers, questions that do not have easy answers. These questions can lead to different types of short- and long-term assignments: free-writing, journals, lab reports, discussion, formal searches for information, communication with others and with communities outside the classroom. Given questions and activities related to real problems, students can more readily explain their thinking to peers. These assignments help students through the interlocking “phases” of the research process that include generating, interaction, refining and recycling (Allan & Miller, 2000). The type of research suggested extends beyond the classroom and is transferable to real world situations.

Although one legitimate type of research used by content teachers involves asking students to research “known data” and represent what they have learned through traditional term papers, students need to do more than report and reflect on the findings of others in order to fulfill requirements (Allan & Miller, 2000; Strickland & Strickland, 1993). Students can participate in real investigations dealing with issues or problems related to content through researching new data (Allan & Miller, 2000). They can take an active role in the research process through gathering and evaluating data from primary sources such as observations, surveys and interviews. Authentic research also involves more than just learning strategies for gathering, analyzing, synthesizing and evaluating; it also requires students to think critically in order to construct representations of what they have discovered for others (Gordon, 1999). It is

essential that research activities do not just require information but also demand creativity—the shaping of ideas taken from informational text for presentation to an audience.

### The Connections Between Research and Technology

*Information is not understanding; information is not education; information is not learning. In order for technology to benefit the classroom, students must do something with the information (Strickland & Strickland, 1993, p. 188).*

Technology can only benefit the classroom if students act on the information that they find through its use. Technology can also function as part of the research process—as an interactive means for gathering, sharing, checking and representing knowledge. By offering a way of holding parts of the research process, technology allows students and teachers a whole picture of the learning.

Teaching research through technology can enhance students' skill in using technology as well as promote their confidence and ability in writing. One of the benefits of computer technology for research is that it encourages risk-taking and revision; students are able to revise their research and writing strategies more easily and function as responders to others' work. So that students can benefit from technology in this way, they need to know that the focus is on meaning and understanding, not the mindless presentation of information (Strickland & Strickland, 1993).

When incorporating technology with instruction, it is important to remember that knowledge is socially constructed; everything we know or believe is negotiated and validated in community. Technology can be used to foster interaction and on-going response to ideas. It can provide for interaction with the teacher in the form of electronic conversations and conferences. Technology also provides connections outside the classroom. Grabe & Grabe (2000) have identified interlocking sub-processes that can help students structure their work through the research process. These include: **task definition, seeking information, locating and accessing information, organizing and communicating, and reflection.**

The element of choice stressed throughout this chapter can extend to the end products of student research products as well (Allan & Miller, 2000). Students can benefit from experimenting with different ways of representing what they have discovered from their research to different audiences (Daniels & Bizar, 1998; Chiseri-Strater & Sunstein, 1997; Allan & Miller, 2000). "If students have the opportunity to communicate their learning in different end products, they exhibit different strengths and accomplishments" (Allan & Miller, 2000). Some various end products of research might include: I-search papers, portfolios, video documentaries, panel presentations, interview articles, biographies, art, music, poetry and fiction (Allan & Miller, 2000; Chiseri-Strater & Sunstein, 1997). Technology also offers infinite ways for students to communicate the results of their research and to reach audiences outside the classroom (see Grabe & Grabe, 2000).

### Guidelines for Research and Technology

- ❶ Make the expectations of the research process clear to improve student achievement. Help students understand that research is discovery as well as recovery. Show them the difference between "reporting" and "research" (Chiseri-Strater & Sunstein, 1997).
- ❷ Create a supporting structure to guide students through their work and gradually ease them into the research process through modeling and explaining strategies for finding and interpreting data (Allan & Miller, 2000; Grabe & Grabe, 2000).
- ❸ Build from student questions. Focus students on the type of questions that lead to critical thinking and discovery rather than presentation of information but allow room for choice. Students can benefit from having choice within limits.
- ❹ Instruct students regarding appropriate conventions and successful strategies for searching, evaluating and using sources and sites.

- ❺ Make clear to students that process is as important as product. Help them see the value of primary sources and provide examples of various ways of obtaining them: interviewing, surveys, case studies, observation.
- ❻ Work with students on options for representing, connecting, synthesizing and using content conventions to demonstrate what they have learned from their research. The product of their research can provide students with motivation for the process and a sense of their accomplishment at the end (Allan & Miller, 2000).
- ❼ Build reflective activities into the research process. Stress the importance of viewing topics and issues from multiple perspectives and help students look at how their thinking changes as they acquire information and test their interpretations.
- ❽ Allow students to present their research as work-in-progress. Provide them with options as well as requirements for representing what they have discovered. Show them how to use responses of the teacher and their classmates to rethink their strategies and make decisions.

Table 4 provides a series of suggested instructional activities to aid students to learn through research and use of technology.

- ▶ Search Projects and Papers
- ▶ Group Investigations and Group Research Portfolios
- ▶ Multi-Media Projects
- ▶ IDEAL Problem-Solving Strategy

TABLE 4. RESEARCH AND TECHNOLOGY ACTIVITIES

Strategies	Descriptor/Essential Elements	How Learning Is Addressed	Assessment Suggestions
<p><b>I – Search Projects &amp; Papers</b></p> <p>Macrorie (1980) Teirney &amp; Readence (2000)</p>	<p>Students select a topic that they want to investigate. There is no set procedure for doing I-Search Projects, but stages in the process involve selecting a topic, planning the search, making decisions and communicating what is discovered.</p> <p>Groups select a problem, issue, question or subculture to study. Students negotiate responsibilities with the assistance of the teacher during group conferences that occur throughout the process.</p>	<p>I-Search Projects build from student curiosity and experience while providing a hands-on, motivating way for students to learn research skills and make decisions that require critical thinking.</p>	<p>Students can assess their own work and the work of class members throughout the I-Search Project. Student conversations about the progress of their research and discussion of problems students encounter throughout their projects can guide the teacher in deciding where students need direct assistance. Some may need more guidance through the process. It can also be helpful for teachers to conduct conferences and discuss class needs with students as they work through their projects.</p>
<p><b>Group Investigations &amp; Group Research Portfolios</b></p> <p>Chiseri-strater &amp; Sunstein (1997) Sharan &amp; Sharan (1990)</p>	<p>Groups negotiate how to represent what they have discovered through a portfolio that might include multi-genre writing, multi-media or hyper-media. When they have completed their research, students write individual reflective pieces about their part in the research process that become part of the portfolio.</p>	<p>Students work from their own strengths and interests to collaboratively plan their research. As they encounter obstacles they must solve problems and make decisions. Group portfolios encourage students to work with people outside the classroom as resources. Because they are discovering new information, working with primary sources, and interpreting fresh data, students think critically and learn research strategies in authentic contexts.</p>	<p>Teachers continually conduct conferences with the groups as they negotiate decisions and become familiar with students' interests and strengths as well as areas that need work. In addition to representing their discoveries in different modes, students reflect on their participation in the group project and assess their portfolios as part of the task.</p>

TABLE 4. RESEARCH AND TECHNOLOGY ACTIVITIES

Strategies	Descriptor/Essential Elements	How Learning Is Addressed	Assessment Suggestions
<p><b>Multi-media Projects</b></p> <p>Grabe &amp; Grabe (2000)</p>	<p>Alternative language and learning experiences are provided through use of educational television, videotaped programs, interactive video and tape recordings.</p>	<p>Projects provide students with sight and sound experiences that introduce them to another dimension of text and information.</p>	<p>Depending on the expected outcomes of the projects as related to content objectives, teachers can negotiate with students to develop rubrics for evaluating multi-media projects. However, it is important for teachers to make expectations clear to students through structured guidelines and assistance throughout the projects.</p>
<p><b>The IDEAL Problem-Solving Strategy</b></p> <p>Bransford &amp; Stein (1984) Ryder &amp; Graves (1998)</p>	<p>In IDEAL activities, students learn to solve problems independently by working in groups</p> <ol style="list-style-type: none"> <li>1) identifying the problem;</li> <li>2) defining the problem;</li> <li>3) exploring strategies to solve the problem;</li> <li>4) acting on ideas to solve the problem; and</li> <li>5) looking for the effects of one's thought processes.</li> </ol>	<p>This strategy increases students' awareness of problem-solving strategies. IDEAL activities require critical thinking, decision-making and negotiation among group members. This strategy also encourages students to deal with real world problems and analyze solutions.</p>	<p>Teachers assess students' processes for completing each stage of the problem-solving strategy. The thinking connected with each stages is as important as solving the problem. The final reflective stage is valuable for guiding students to evaluate their own learning and teachers can respond to this phase to reinforce and guide thinking related to content.</p>

## SUMMARY

### Critical Literacy and Content Learning

There are four significant themes recurring throughout this chapter: **the importance of building from students' prior knowledge; the importance of student choice; the focus on critical thinking in authentic dimensions; and the value of reflection in helping students become more aware of their strategies for making meaning.** Throughout this chapter, the need for students to become more critically conscious of what they are using to construct meaning was stressed. The aim of this type of critical literacy instruction is to enable readers to question texts and see how they provide selective versions of the world (Moje et. al., 2000). Although reading and writing are ways to help students think more critically, Cunningham (2000) suggests that listening and speaking in the form of discussion can also help students become more discriminating as they learn. Through participating in the literacy activities suggested throughout this chapter, students can become critical consumers and producers of texts. The literacy practices and activities push students to learn new things, to have new experiences, to read their worlds in new ways, to "stretch their thinking" beyond prior knowledge while honoring their backgrounds and experiences (Moje, et. al., 2000).

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