CHAPTER 6

Making Content Instruction Accessible for English Language Learners

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The everyday demands of classroom instruction increase in complexity from year to year—with respect to curricular demands, accountability, and the diversity of the student population. New state frameworks and instructional trends require grade-level curricular standards to continually change. The demands of accountability vis-à-vis state standards and student performance on standardized tests influence district policies regarding instructional practices and how to best address the needs of the burgeoning numbers of English language learners.

In addition, the linguistic diversity of English language learners has important implications for the design of programs intended to address the range of levels of English language learners' oral fluency, literacy skills, and cognitive growth. A variety of materials can be used to engage learners in English language content instruction; however, if these students are to attain grade-level standards in English language subject matter instruction, they must master communicative and cognitive skills as well as master strategies for reading and learning from expository text, the staple of content instruction and the dominant type of text included in materials employed to teach content. This formidable mix of demands requires an answer to these two questions: (1) How can teachers effectively manage the complexity of skill, content, and English language development instruction and also make this instruction accessible to English language learners? (2) What are the implications for determining appropriate instructional materials?

This chapter will present ideas and strategies to help teachers optimize the education of English language learners in subject matter instruction. The

potential to teach language and to enable access to learning across content areas will be addressed through four key instructional dimensions: communication-based instruction, content-based instruction, cognitive development, and study skills. Implications for appropriate instructional materials will also be addressed.

Communication-Based Instruction for English Learners

Communication-based instruction can be an effective tool for providing English language learners access to content area learning. Communication-based instruction is designed to parallel the way children acquire their first language. Krashen's (1982) acquisition-learning hypothesis holds that infants acquire language subconsciously rather than cognitively learning the language (see Crawford, chapter 7 in this volume, for an expanded description). When learning content in a second language, students need instructional approaches that allow them to interact with and construct meaning from lessons presented in class. Language is the medium for learning and communicating important subject matter. For students learning *in* the language rather than *about* the language, effective communication is interactive, authentic, and meaningful, with ample opportunities to hear and respond in the target language and to get feedback from native speakers, the teacher, instructional assistants, volunteers, and other English language learners.

Direct and indirect modeling of English language structures and conventions with corrective feedback can and should be included in communication-based instruction through directed lessons according to Fillmore and Snow (2000). Gersten and Baker (2000) also believe that English learners need formal feedback if they are to learn the language; however, they point out that merging content instruction with English language development usually truncates the amount of time devoted to learning the second language. They believe that sheltered instruction (instruction designed for making sure English language learners understand content instruction) usually does not include adequate English language development in the context of writing. Like Snow and Fillmore (2000), they believe that this phenomenon has a deleterious effect on student writing.

The written conventions of the target language should be linked to oral communication and content through daily language lessons in writing, spelling, and grammar that are connected to the related readings of the content curriculum, not taught as isolated and unrelated skills. Connecting daily

language lessons to related reading succeeds in linking written language conventions to oral communication and content by demonstrating for English language learners the ways in which writers use literary devices such as figures of speech, similes, idiomatic expressions, metaphors, imagery, analogies, and the prosodic features (rhythm, intonation, and phrasing) of the dialect. The readings help demonstrate the use of grammatical structures and spelling conventions across genres of literature and expose English language learners to new vocabulary development in context rather than in isolated word lists that have no meaning or connections to their world (see Dutro & Moran, chapter 10 in this volume).

In content instruction, it is important for students to learn the structures of the English language in order to interpret the work of related readings across subject matter instruction. The ability of English language learners to succeed in "content" learning has to do with how well they can infer meaning, draw conclusions, learn terminology, analyze problems, and synthesize information from various sources, which means they need to transfer and apply reading and language conventions across the curriculum. Students make gains in language acquisition by interacting with speakers of the English language in meaningful contexts, and their English language oral fluency increases as they begin to respond and sustain communication in the target language—just as accuracy in reading and writing develops with daily involvement in purposeful application. When language is regarded as a medium of learning, it offers a context for communicating the thinking process in the subject matter without the need to translate content.

The Benefits of Sheltered Language Strategies

Sheltered language strategies allow students to develop knowledge of subject matter areas through their English language. Through these strategies, teachers ensure that lessons are comprehensible to learners of different English language proficiency levels and also provide English language development (see Graves & Fitzgerald, chapter 5; García & Beltrán, chapter 9; and Dutro & Moran, chapter 10, in this volume).

An effective sheltered instruction technique is to draw from the learners' background knowledge in the area of study. Relating the subject matter to the students can involve not only asking questions regarding what they have learned in school about the content but also eliciting what students know about the topic from their own life experiences and personal connections. If the teacher observes that students lack sufficient background or personal information or

connections about the subject, then lesson planning needs to present basic foundations of the subject matter through the use of visuals, realia, hands-on experiences, guest speakers, field trips, or related readings. During content instruction, complex concepts and information can be clarified through demonstrations and experimentation. Lesson delivery should include simplification of explanations and vocabulary development by means of showing examples, demonstrating differences and similarities, and speaking with simpler syntax and added gestures. As the students acquire more oral fluency and comprehension, the complexity of content that they can handle can increase gradually as a result of their more frequent communication in context-reduced discourse (Mohan, 1986). It is important to maintain a comfortable participatory learning environment that allows students to practice their English language without fear of making errors, seeking clarification, or taking linguistic risks.

Giving students an amount of "wait time" to interpret information or to process questions related to content is encouraged before demanding a response. Students learning content via a new language may have difficulties with cognitively demanding tasks or with discussions presented in context-reduced situations with few external supports for meaning. Students may want to participate, but they may have difficulty formulating a response or incorporating appropriate content vocabulary learned in class. It is important for the teacher to frequently check learners' comprehension by collecting and evaluating student work samples in the subject area. Monitoring a student's degree of complexity in the use of the English language is another way of measuring progress in English language acquisition through communication-based instruction.

In addition to the sheltered strategies presented for communication and comprehension of content learning, there are other approaches to stimulate a communicative setting in the classroom. The next two sections present opportunities for positive peer and teacher-student interactions in a community of learners that allows for negotiation of meaning through conversations and discussions.

The Benefits of Student Interaction

English language learners benefit from language modeling and reinforcement of linguistic structures through peer interaction in the classroom. Students then have the opportunity to learn the target language in a natural communicative setting through the use of authentic and meaningful language. Providing an opportunity for daily peer interaction in the classroom allows for the academic and language success of the students. The interaction gives students a chance to develop an understanding of one another's culture. This enables positive

cross-cultural attitudes to develop among the learners because the diverse languages and cultures represented in the classroom are assigned equal status (see George et al., chapter 13; Boyd-Batstone, chapter 14; and Gallego et al., chapter 16, in this volume).

There are programs that tend to group students in separate classrooms by language dominance; native speakers are grouped together for their daily program, while English language learners are assigned to other classrooms. If at all possible, native speakers and English language learners need the opportunity to participate jointly in content learning through team teaching situations in which student groups are integrated for instruction (see Coppola, chapter 8 in this volume). According to Cummins (1981), children best learn the English language when they are actively involved in the process of communicating with one another. Therefore, activities should include the integration and joint participation of speakers of the target language with English learners whenever possible (see also Crawford, chapter 7 in this volume).

Peer participation incorporates collaborative learning through mixed groupings comprised of various levels of language production and content expertise. A variety of groupings—pairs, triads, and small groups—can facilitate learning and meet the linguistic and instructional demands of all learners. Students in such settings have the opportunity to gain insights on how others access curricular knowledge and process information in their English language. Social learning theorists have shown that students learn and are motivated by observing others' actions and their consequences (Bandura, 1977)—for example, by observing someone persist in a task and achieve success. Student motivation can, therefore, be strongly influenced by the study behaviors modeled in class: They can observe how other learners manipulate the expository material contained in textbooks, handouts, computer-generated printouts, or library references. There is no better way to learn reading strategies for nonfiction material than to see other students infer meaning from a text. Interaction encourages students to become educational and social partners in the process of learning. Such partnerships lower the anxiety attached to seeking necessary assistance when presented with new concepts or difficult content materials in class. The resulting opportunities to verbalize content knowledge open doors for authentic peer dialogue.

The checklist in Figure 6.1 can be used with a partner to augment reading comprehension of nonfiction texts in the English language. It also can be used as a guide for teachers previewing text before reading or monitoring comprehension during the reading process.

FIGURE 6.1 Strategies for enhancing reading comprehension

DIRECTIONS: Use this checklist as a guide to help you understand the material when you read the selection alone or with a partner.

1. Preview the material: What text features do I need to find by scanning text?
   - ___ Title and subtitles
   - ___ Labels
   - ___ Illustrations and/or photographs
   - ___ Graphics, visual aids, maps
   - ___ Boldface and/or italicized words
2. Predict content: What is the topic? What are the main ideas?
   Write a prediction: _____
   _____
3. Check for comprehension: Do I understand the material?
   - ___ Quickly skim through the material to get an overview.
   - ___ Divide the reading selection into smaller sections.
   - ___ Read first and last paragraphs to understand what the material will cover.
   - ___ Begin reading sections; stop to summarize and ask questions.
   - ___ Reread if confusing, and stop more frequently to summarize.
   - ___ Refer to graphics and visual aids to further clarify main ideas.
   - ___ Clarify vocabulary by using context clues and checking glossary or dictionary.
   - ___ Read summaries at the end of each section or chapter to identify important concepts.
   - ___ Write down the main idea for each section or page you read.

   If you are working with a partner:
   - ___ Tell your partner what you have just read.
   - ___ Your partner will ask you questions to clarify your understanding.
   - ___ Have your partner tell you what he or she has read.
   - ___ Ask your partner questions to clarify his or her understanding.
   - ___ Together, write or make a graphic organizer to summarize the information.
   - ___ Repeat this process as long as needed.
4. Key Words: Which words helped you understand the text?
   List vocabulary related to the topic: _____
   _____
5. Clarification. What information is unclear?
   I/we need clarification in the following areas: _____
6. Reading Level: Was the reading level appropriate? ___ yes ___ no
   Select one: Difficult Just right Simple
   I was/We were unable to understand the text because _____

The Benefits of Teacher-Student Interaction

Equally important for English language learning is modeling by and interaction with the teacher. Teachers must provide students with modeling of the strategies needed to comprehend content material and content instruction. Teachers can, for example, model active listening skills by maintaining eye contact with a speaker and watching his or her gestures. Teachers can direct students how to use textbooks, reference materials, or environmental print in the classroom to enhance understanding of the subject matter. Learning to take notes, make an outline, pose a question, or otherwise seek help can also be demonstrated.

Effective teacher-student interaction involves interacting equally with all students during whole-class or small-group instruction. Providing students with equal access to the curriculum may require certain academic interventions, mediated structures, or other additional assistance. It may be necessary to prompt or give additional response time to newcomers or beginning-proficiency students who are in need of teacher guidance and reassurance.

A critical aspect of the development of language and content learning is providing a setting for English language learners to negotiate meaning in daily instructional interactions. *Negotiation of meaning*, a term coined by immersion experts (Cloud et al., 2000), is the process by which participants arrive at understanding one another. It is the collaboration needed in conversations or discussions to express needs, ideas, thoughts, and intentions; it also involves helping others extend and refine their communication skills. The strategies used in the negotiation of meaning are both verbal and nonverbal. A verbal strategy might involve expanding answers to refine the language with the use of semantics, settling on an appropriate rate of speech or providing simplified vocabulary, paraphrasing, or sentence structure to clarify meaning. A nonverbal strategy might incorporate facial expressions and gestures to match what students hear with what they see or do.

As students begin to acquire higher proficiencies in the English language, teacher-student interactions need to gradually model more complexities in language structure. According to the input hypothesis of Krashen (1985), input promotes progress when it is more advanced than the learner's level of proficiency. The learner acquires the ability to function in a new language by listening to input a little more sophisticated than his or her actual level of language production. Vygotsky's (1978) theory of the Zone of Proximal Development is another way to view this means of language learning. According to Vygotsky, children can learn within a range: tasks children can complete independently are at one end of the range, and tasks they cannot complete, even with assistance, are at the other end. The zone most productive

for children is between these extremes, where there are tasks children can complete when assisted by a knowledgeable or more competent other.

Face-to-face interaction with the teacher tends to provide useful visual cues and nonverbal language to augment comprehension of subject material presented in the lesson. This provides the opportunity for English language learners to engage in content learning through the process of creative construction. The teacher has an opportunity in the classroom to model correct language use and to provide indirect and direct error correction. He or she can provide optimal language input and allow for maximum student output by utilizing higher-order thinking and questioning skills (see Dutro & Moran, chapter 10 in this volume).

Content-Based Instruction for English Learners

According to Cloud and colleagues (2000), there are three goals for content area instruction, which the authors term "goals of integrated instruction": content, language, and general skills goals. *Content goals* include conceptual learning of knowledge and skills required by the subject matter. *Language goals* address learning the precise vocabulary words and sentence patterns needed to communicate content. Achieving *general skills goals* means attaining study skills that promote both language and content learning. In content-based instruction, students are not only learning to communicate in the language of the subject; they are communicating *about* the subject by constructing meaning.

Subject matter is taught through communicating content and concepts in a meaningful construct, not through rote drills or practice of isolated skills at the end of a lesson. English language learners need to use language in purposeful contexts as a means to learn content. Instructional approaches should include progression from concrete to abstract thinking, including a rich use of oral and written language forms. Instructional units may be presented through thematic and interdisciplinary approaches so as to allow students to transfer concepts across curricular areas. Learning to create and compile sets of data for a math project, for example, can result in students understanding how to interpret charts, tables, and graphs in science or social studies textbooks (see Crawford, chapter 7 in this volume).

Lessons may need to be sequenced with careful planning so that students can be exposed to information needed as a prerequisite for another subject matter, particularly in the areas of math and science. For example, students

may need to have a math lesson on liquid measurement before they can perform a particular science experiment. English language learning should not be a barrier to learning scientific thinking requiring analysis, inference, synthesis, formulation of conclusions, or evaluation; these higher-order thinking skills appear in content standards across the curriculum and are necessary for students' success in subject instruction (see Laturnau, chapter 12 in this volume). Students should be guided to see that these thinking processes are common in everyday life situations; lessons can then be adapted to demonstrate how the critical thinking used in their personal lives can be transferred to academic thought.

Classroom lessons incorporate the use of the English language to communicate content standards and follow-up activities. The underlying premise of content-based instruction is based on student-centered activities, the performance of which ensures comprehension and mastery of lessons. According to Mohan (1986), the term *activity* refers not just to something we get English language learners to do but rather to a combination of performed action and acquired theoretical understanding. In Mohan's understanding, an activity is a basis for a knowledge framework. Activities need to include the daily practice of newly learned skills through experiential approaches and an understanding of how what is learned is linked to the activity; Mohan refers to this as an *expository* approach, in that it is verbal and explicit. It is the combination of an action situation and a theoretical knowledge structure that creates the framework for an activity.

English language learners need to be exposed to both sides of the knowledge framework. One side is addressed by involving students in general theoretical concepts through communicative approaches and support from visual aids. The purpose of this component of the framework is to explain background information of concepts and classification of the topic; present the principles through methods, techniques, and strategies; or evaluate goals and appropriateness through the use of visual displays found in graphs, tables, charts, symbols, and other representations of the rules and norms (Mohan, 1986). The other side engages practical knowledge as presented through a discourse of pictures, film, drama, or experiential events. These specific, practical aspects of knowledge demonstrate concrete examples within the topic material by describing, sequencing, and making decisions in action situations (Mohan, 1986). Pictures or photostories in manuals or guides provide the "who/what, where, and when" of the real world. Films or videos demonstrate processes, procedures, or routines for science and math. Acting out a situation can present the conflicts, alternatives, or decisions involved when

addressing school safety, first aid administration, or substance abuse. Incorporating experiential activities that relate to the English language learners' background knowledge connects the framework to what they already know or have experienced in life (see Graves & Fitzgerald, chapter 5, and García & Beltrán, chapter 9, in this volume).

Graphic organizers can help the visual representation of knowledge in content-based instruction. Their purpose is to organize information by using labels to arrange important aspects of concepts or topics into patterns. Organizers are used in a variety of ways to facilitate prereading, postreading, prewriting, revising, summarizing, comparing, and other arrays of symbolic information (configurations and organizational patterns that display information graphically prior to developing an essay, responding to a reading, summarizing information, researching a report, etc.). The implications are dramatic for the instruction of English language learners because the process of preparing arrays of symbolic information helps them build a framework for learning key ideas and vocabulary. Bromley, Irwin-DeVitis, and Modlo (1995) argue that graphic organizers help simplify the learning process and produce understanding. Organizers help construct knowledge into categories, which assists the brain in sorting through thought and language. The organizers provide mental tools for the English language learner to remember key ideas through a combination of visual and verbal language. Bromley et al. describe four basic organizers through which knowledge is constructed: *hierarchical*, *conceptual*, *sequential*, and *cyclical*. Hierarchical graphics are main concepts ranked by levels and sublevels, such as a flow chart of linear classifications. A conceptual organizer is a central idea supported by facts, such as a mind web or Venn diagram. A sequential category provides a chronological order of events, as in a timeline. Cyclical patterns depict circular successions or cycles (e.g., precipitation, evaporation, and condensation in the rain/water cycle). English language learners can augment their comprehension in subject matter instruction by learning to select and apply graphic organizers to construct meaning in content learning.

Accessing Comprehension Skills in Content Learning

Comprehension is the outcome of a reader interacting with a text and constructing meaning. Because the ability to process information resides in the reader, the cognitive processes that lead to more advanced comprehension skills can be taught to English language learners. Texts can be used as references when students discuss points of view or main ideas and support them

with examples. The teacher can check for accuracy when students summarize information, sequence events, infer conclusions, or compare and contrast points of view. Students who are unable to access a text due to the readability level may have high cognitive ability but lack proficient literacy in the second language. These students can still benefit from class discussions by adding their own personal experiences or observations related to the topic, while the teacher attempts to bridge the gap between what students already know and what they are about to learn. The text can be read to the students, or recorded text can be played. As the students acquire content literacy in the English language, they will be able to increase their participation in reading and writing appropriately for their age and level of proficiency (see Coppola, chapter 8, and George et al., chapter 13, in this volume).

Students can become more efficient in locating and processing written information when they establish a purpose for reading and learn strategies for inferring meaning from content materials. Many times, English language learners are confronted with reading material in a subject matter that is beyond their reading level. Comprehension strategies for content areas can be taught in lessons to address their literacy needs. Before reading a text, the instructor can provide a brief overview of the content material being presented to formulate a purpose for the reading. A stimulating class discussion can access students' backgrounds and cultural knowledge of the subject prior to the lesson; students can discover and better understand ideas through sharing concrete experiences and examples before reading the text.

When students *are* reading the material, they may need teacher guidance in order to access information. The teacher may provide guided questioning; model dividing the text into sections; direct students on how to use study guides, outlines, or notes; or even teach how to set a pace for their reading. In setting a pace for reading, students need to know how to determine what parts to read intensively and what parts to ignore; it is imperative to show English language learners how to determine when passages can be skimmed or scanned. Chapters or books do not need to be read from cover to cover or in a linear way; students can skip sections, flip pages, find key headings, browse, tab pages, or attach sticky notes. Knowing how to use the parts of a book—indexes, tables of contents, glossaries, maps, tables, or charts—also can help English language learners access information quickly. English language learners need to understand the difference in format between fiction and nonfiction materials because ultimately students will need to use nonfiction materials to research information when furthering their studies in a particular area. It is important to point out to students how expository information is organized in

textbooks because the textbooks can serve as models for students as they write outlines, notes, or reports and can facilitate comprehension.

The list of steps in Figure 6.2 can assist English language learners in accessing information from textbooks, particularly when the material presented is beyond the reading level of their English language. The teacher can use this guide with his or her students when textbooks in various subject areas are introduced in class.

By embedding language objectives in content instruction, one can explain how mechanics and conventions in one subject matter parallel written formats in other curricular areas. Students need to be aware that making an outline, writing a summary, adding supportive details, and comparing and contrasting two topics are interdisciplinary skills applicable across the curriculum. Once students learn the value of these academic cognitive skills in one subject area, they can learn how to transfer strategies learned from one domain to

FIGURE 6.2 Guide to enhancing comprehension of features in content area textbooks

1. Provide an overview and allow students to preview the material.
2. Assess students' backgrounds and experiences related to the subject matter before beginning a unit.
3. Demonstrate layout and features of the textbook by identifying the purpose of the following elements: title page, table of contents, unit sections, glossary, index, appendixes, and other references.
4. Examine format of text pages by identifying chapter headings, subtitles, boldface/italicized words, columns, margins, guide words/vocabulary.
5. Point out the use of visual elements designed to assist with comprehension of text: illustrations, photographs, charts, graphs, symbols, maps, diagrams, tables, chronologies.
6. Guide students regarding how to find introductions, directions for procedures, definitions of terms, steps for experiments, enrichment activities, study guides, review questions, and summaries.
7. Explain how to cut through text density and technical vocabulary to find important passages and key concepts using skimming or scanning.
8. Describe importance of concise language in explaining certain terms, symbols, and expressions, as in mathematics.
9. Demonstrate differences between primary and secondary sources cited in textbooks, such as diaries, journals, autobiographies, other literature, links to arts/technology.
10. Monitor reading comprehension as students work with textbooks to read and locate information.

another. English language learners have to know how to recognize high-frequency words that appear in texts in order to facilitate the reading process and increase fluency. Many high-frequency word lists are available from publishers and can be included in reading/writing folders for students or enlarged for use as classroom charts.

It is important to provide English language learners with independent reading time when they can research information with a reading buddy who can help interpret important information from texts or demonstrate the use of technology for research in the classroom. Students should be encouraged to consult with peers and engage in small-group discussions about their topics of study, taking advantage of materials used in class. By demonstrating how ideas and text are bound together in nonfiction materials, teachers can enable English language learners to succeed at the tasks of reading, writing, and comprehending subject matter.

Accessing Content Vocabulary

Proper language development depends on the explicit and implicit language of the curriculum (Genesse, 1994). We employ explicit language when we teach language arts through standards, the language skills learned progressively at each grade level. Implicit language is engaged when language is the medium and not the objective of the lesson. Language is embedded in the curriculum, allowing for authentic continuous language development and exposure to the target language during content learning.

It is essential to familiarize English language learners with clear content vocabulary related to the unit of study. Excessive vocabulary, however, impedes students' ability to understand lessons or materials presented in class by obscuring the message and overloading students with sentence complexity and difficult vocabulary unrelated to the content standard. Content-obligatory language is related to mastery of content standards (Cloud et al., 2000); it is the vocabulary required to understand and communicate about the content. Content-obligatory language can be entered in student journals as it is introduced in lessons; students can then be asked to explain and illustrate obligatory language through examples. Vocabulary charts also can be hung in the classroom as environmental print for English language learners to reference as needed. More abstract vocabulary can be introduced by providing concrete experiences (e.g., observing *metamorphosis* in a lab setting or walking along a stream to learn about *erosion*)—supplemented by visual aids such as pictures, photographs, diagrams, videotapes, pictionaries, and transparencies—and by

having students create their own graphic organizers. Teacher manuals and support materials can provide numerous other suggestions for teaching vocabulary development. The organizer in Figure 6.3 can help students define content-obligatory language in subject-area instruction.

Content-*compatible* language stretches, refines, and expands language growth beyond the students' present levels of attainment. Compatible language is not required for the mastery of content; its acquisition is driven by students' expected growth in English language development and subject-area learning. Rich experiences in vocabulary development—such as learning multiple word meanings, doing word studies, using word banks, or making semantic maps—can yield rich word usage and an understanding of the contexts in which words appear. Students can also enter content-compatible vocabulary in journals, learning logs, and study guides. In daily writings, students can demonstrate understanding of key elements of language by comparing and contrasting definitions, providing synonyms or antonyms, writing their own definitions, or summarizing information using the new vocabulary.

When reading in content areas, students can attempt to read entire paragraphs even if they encounter unfamiliar words, so as to determine whether certain words are essential to the comprehension of a passage. Is the meaning clear, or is it uncertain because of unknown vocabulary?

FIGURE 6.3 Organizer for teaching content vocabulary

DIRECTIONS: Complete the vocabulary map. Use context clues, a glossary, or a dictionary to complete sections.

Topic: _____ Word: _____	Picture
Meaning	Word Analysis _____ _____ _____ prefix root suffix
Synonym	Sentence

English Learners and Cognitive Development

According to Piaget's theory of universal developmental stages for cognitive reasoning (1959), young children construct understanding in the context of their own activity. They progress from concrete to more abstract thinking, from figurative to operative aspects of cognition. Therefore, students learn more easily when they can manipulate objects rather than use abstract thought. The implications of this theory are that English language learning should follow instructional approaches that progress from concrete to abstract and employ rich learning experiences that develop cognitive thinking.

When the environment supports the learner, meaning is constructed in accordance with the learner's background knowledge or his or her use of the primary language to explain complex thought. This allows for already existing structures, referred to by Piaget as schemata, to adjust to new information being presented in the English language. Schemata are defined as previously acquired knowledge structures that help students process and organize new information and translate it into cognitive and linguistic growth. This information on how students construct knowledge parallels the common underlying proficiency model introduced by Cummins (1979, 1987), which posits that knowledge learned in one language transfers to a second language once students have acquired the linguistic skills to express that knowledge.

According to Cummins (1981), it takes an average of five to seven years to acquire cognitive academic language proficiency (CALP), a level at which English language learners can use higher-order thinking skills—analysis, synthesis, evaluation, generalization, conclusion formulation, etc.—in language and thought. Lack of linguistic development in either the primary or the English language can have negative effects on cognitive development.

The trend within content areas is to create learning environments that promote purposeful activity via sustained exploration of themes that are interdisciplinary. Some classrooms re-create time periods in history through the use of student plays, art projects, journal writing, guest speakers, field trips, artifacts from museums, exploratory materials, music of the times, literature and poetry, mathematical activities, and scientific experiments. For English language learners, extending beyond the textbook offers new ways to access and actively construct knowledge about a given subject or theme.

English language teachers should present content area instruction by a concrete approach that creates an exploratory and discovery-type learning environment in which students learn by doing—conducting experiments, observing and collecting data, etc. This approach empowers students to do their

FIGURE 6.4 Lesson planning for content instruction

<table>
<tr><td colspan="2">Subject

Date</td><td colspan="4">Content Standard

___New Concept ___Review ___Reteach</td></tr>
<tr><td colspan="3">Language Objective</td><td colspan="3"></td></tr>
<tr><td colspan="3">Instructional Materials</td><td colspan="3">Experiential Activities (concrete to abstract)</td></tr>
<tr><td colspan="3">Content-Obligatory Language
Mastery of Concepts: Words
and Phrases</td><td colspan="3">Content-Compatible Language
Refinement and Growth:
Integrated Vocabulary</td></tr>
<tr><td colspan="3">Teacher Modeling Strategy</td><td colspan="3">Opportunities for Peer Interaction</td></tr>
<tr><td colspan="6">Lesson Procedures</td></tr>
<tr><td colspan="2">Monitoring Comprehension</td><td colspan="2">Study Skill Taught?</td><td>Assessment</td><td>Homework</td></tr>
</table>

own thinking, value their contributions, and participate as active learners in the classroom. It can also augment textbook-oriented lessons, which tend to present information accumulated through fact-finding and driven by extensive use of language and concept load. Figure 6.4 provides a sample teacher lesson plan for content learning.

Accessing Cognitive Development in Mathematics

Consider cognitive development in mathematics: Teaching literacy in the context of mathematics has led to an emphasis on the relation between the ability to read and the ability to solve mathematical problems. First, teachers need to

find out if a learner's inability to solve problems is caused by the readability level of the materials or by the reader's lack of literacy proficiency in the first or second language. Appropriate modifications might involve simplifying the language of the material or mediating reading strategies for content learning with the student. Teachers should also determine whether errors leading to mathematical miscalculations are caused by a lack of basic computational skills or by failures in reading comprehension.

Students should be asked to explain the meaning of mathematical terms and phrases such as "greater than," "round to the nearest," "least common denominator," and "find the product of." Another indication of whether mathematical language has been internalized is students' understanding of synonyms related to mathematical terminology. For example, students can name all the different ways to say "add" in problem-solving situations, or can create a list of related terms, such as *sum*, *increase*, *combine*, *addition*, *include*, *total*, *in all*, and *all together*. English language learners need to internalize mathematical terms and phrases connected to their grade-level standards in order to attain a level of skill mastery in the continuum of cognitively demanding and undemanding tasks (Cummins, 1987). Whenever new linguistic skills must be used to communicate, active cognitive involvement occurs. Cummins (1987) defines cognitive involvement as the amount of information that must be processed simultaneously or in close succession by the individual to carry out the activity or task. Thus, if students lack development in mathematical language, the task of problem solving becomes cognitively demanding. However, as students acquire the content vocabulary and relate the terms to the mathematical procedures, the cognitively demanding tasks move up the continuum to become cognitively undemanding until finally they are mastered and become processed automatically. Students need to be aware of the steps in effective mathematical problem solving, including using context clues, finding key words, interpreting questions, eliminating unrelated facts, knowing which operation to use, drawing pictures, and writing equations or numerical sentences. English language learners need to know how problems are structured and what strategies are needed to solve different types of problems. English language learners must fundamentally know that the processes employed to solve problems involve both reading strategies *and* mathematical thinking.

The thinking can be either cognitively demanding or undemanding depending on how well the students have been prepared to learn and apply the mathematical language to the cognitive process. The checklist in Figure 6.5 provides strategies to assist students in solving mathematical problems.

FIGURE 6.5 Strategies for problem solving in mathematics

DIRECTIONS: Use this checklist of strategies to help you find the best method for solving mathematical word problems.

_____ Read and think aloud the problem.
_____ Decide what the problem is asking.
_____ Identify and list the important facts. Eliminate unnecessary data.
_____ Simplify the language or numbers in the problem.
_____ Sort material and analyze the parts.
_____ Find and underline key words or terms.
_____ Redefine the problem in a familiar context.
_____ Act out the problem in your head or with a partner.
_____ Draw pictures to help visualize the problem. Label the pictures with the numbers in the problem.
_____ Estimate or round off the numbers in the problem.
_____ Work the problem backward.
_____ Find a logical solution to the problem.
_____ Determine whether the problem has multiple steps.
_____ Choose the operation(s) you need to solve the problem; write a formula for applying it.
_____ Find a pattern or rule appropriate to the problem.
_____ Organize and label relevant information.
_____ Determine whether you need to use tools such as rulers, compasses, protractors, calculators, scales, balances, measuring cups, thermometers, or clocks. Do you need multiplication charts? Determine whether metric or standard measurements apply.
_____ Determine whether you need to compile data: Add graphs, tables, charts, diagrams, or maps, as needed.
_____ Check results; discuss process with partner; ask for clarification.

Study Skills as Learning Tools for English Learners

In content instruction, English language learners not only must learn specialized subject matter and language skills associated with the content area but also must develop basic study skills to enhance learning across the curriculum. It is important to teach English language learners study skills and the learning tasks for which they are appropriate because many of those students come to school after fragmented years of instruction. Some are trying to cope with overwhelming linguistic and academic demands; some are trying to adjust to changes in a new country of residence; and still others may have parents with limited schooling who can provide little in the way of academic learning. Many have not been properly taught how to set or achieve general skills goals. As

researchers have observed, successful and unsuccessful students differ greatly in their use of study skills (Gall, Gall, Jacobsen, & Bullock, 1990).

Study skills can help English language learners identify general learning goals associated with academic success (Pérez & Torres-Gúzman, 1996). For example, parents should encourage students to set aside a routine time and quiet place to study at home where supplies are readily accessible. Parents need to learn how they can provide motivational support and promote good study habits for their children with the help of educators and the school system.

Much of children's success in school depends directly on their ability to *listen*, because listening is the primary medium of classroom learning. Listening skills, like many other study skills, are learned behaviors that affect academic performance.

According to Pérez and Torres-Gúzman (1996), students need to prepare themselves for a *thinking* curriculum. This includes not only knowing how to select and organize materials but also how to collect, integrate, and process information. Pérez and Torres-Gúzman recommend that students learn to set a purpose for reading and commit themselves to develop critical reading skills by reading daily. English language learners need to apply multiple strategies for reading comprehension and literary analysis. Understanding ways to use semantic maps and word analysis, outline passages, and write and report information supports the growth of cognitive processes that will nurture and facilitate learning.

*Meta*cognitive processes, which Jones (1986) defines as "thinking about what one knows and how to control one's learning process" (p. 9), involve (a) knowledge about one's own study skills and habits, including one's strengths and weaknesses as a learner; (b) the ability to direct the success of one's study behavior by selecting an appropriate learning strategy for a particular study task—for example, taking notes, reviewing for a test, or breaking down large tasks; and (c) the ability to monitor the effectiveness of a given learning strategy and know when to switch to an alternative study skill when a given learning strategy is unsuccessful. Students who have a limited repertoire of learning strategies may continue to use a given learning skill even when it is inappropriate. That is why it is so important to teach English language learners multiple study skills that they can use to self-monitor their learning. Researchers have found that students who perceive themselves as being in control of their own destiny and responsible for their own learning are more motivated to continue learning new skills (Schmeck, 1988).

The current interest in study skills instruction is part of the push for higher standards of performance for English language learners. As curricular

standards become more rigorous, students will need more sophisticated strategies to succeed and compete in academic settings. Unless they receive study skills instruction along with language and content teaching, many English language learners are likely to become overwhelmed and achieve less. Figure 6.6 is a matrix of study skills that contribute to successful learning. Desirable learning strategies are listed first, followed by guided prompts and suggested actions. The second guide, in Figure 6.7, shows study skills that assist students in self-monitoring their progress.

The Implications for Instructional Materials

Today's instructional materials are not just a grade-level math, science, or social studies text full of information, skills, exercises, and questions. Classroom materials are more complex and elaborate than ever before and include related and extended readings of primary documents, novels, poetry, legends, biographies, research, plays, and other forms of text; however, the use of expository text, as opposed to narrative text, still dominates content instruction. To enable English language learners to meet state standards, expose them to the same historical and scientific perspectives afforded other children, and give them an opportunity to learn from the instructional materials used to teach content, classroom materials for communication-based instruction must be written in a way that facilitates and promotes comprehension, especially for the English language learner. As all students progress through the grades, higher and higher proportions of what they read are expository in nature.

How comprehensible is the text for any reader? One aspect of that comprehensibility is related to text structure, which can be very problematic for English language learners. Among the plethora of text structure features, text coherence has been found to promote or impede the comprehension of text depending on the absence or presence of certain text characteristics and depending on the degree of effectiveness of the specific characteristic when it *is* present. Seminal studies on this feature of text were conducted by Beck, McKeown, Omanson, and Pople (1984); Beck and McKeown (1988); Beck, McKeown, and Gromoll (1989); and Beck, McKeown, Sinatra, and Loxterman (1991). According to García (1994), text coherence is the quality of text that would assist the reader in connecting pieces of text information and combining this information with prior knowledge to develop a coherent representation of the text. It is comprised of five factors: (1) the explicitness of the text, (2) easily inferred causal relations, (3) relevancy, (4) consideration of prior

FIGURE 6.6 Student guide to study skills

Learning Strategy	Student Prompt	Action
Organizational Skills	Space Management	
	Can I find my work and books easily?	Find a safe place.
	Do I know where to find classroom materials?	Locate their proper place.
	Do I use charts and references when needed?	Use environmental print.
	Am I storing or filing materials correctly?	Find system procedures.
	Do I have a place to do homework?	Find a quiet place at home.
	Time Management	
	Am I using time wisely at school?	Stay on task.
	Do I balance school, fitness, and social activities?	Prioritize activities.
	Am I handing in assignments on time?	Write down due dates.
	Am I prioritizing assignments properly?	Determine relative importance and appropriate order.
	Self-Management	
	Do I get enough rest at night?	Set a sleep schedule.
	Am I allowing time to eat properly?	Eat healthily and regularly.
	Am I avoiding harmful substances?	Say no to drugs.
Work Habits	Assuring Access	
	Are my supplies and books readily available?	Have materials ready.
	Are my binders and folders organized and available?	Use tabs and label materials.
	Do I have the proper homework materials?	Obtain appropriate materials.
	Following Procedures	
	Do I exhibit regular attendance and punctuality?	Maintain daily schedule.
	Am I familiar with classroom and school rules?	Learn classroom and school rules and policies.
	Do I follow directions in class, in labs, and at the library?	Learn proper procedures.
	How do I retrieve materials at school?	Learn school regulations.
	When is my homework due?	Keep an assignment sheet.
	How do I fulfill class requirements?	Know the grading policies.
	Applying Oneself	
	Do I memorize material?	Dedicate time and apply learning strategies.
	Do I apply what I am learning in class?	Practice new study skills.
	Do I study for tests?	Prepare for exams.
	Do I complete assignments?	Finish work on time.
	Am I doing homework?	Complete and return assignments.
	Do I review returned assignments and tests?	Examine, and learn from, returned work.
	Am I breaking down big tasks into subtasks?	Chunk text into sections and set reading pace.

FIGURE 6.7 Student guide to study skills: Staying ahead

Learning Strategy	Student Prompt	Action
Monitoring Performance	Methods	
	How can I remember information?	Take notes, underline.
	How do I begin to write?	Brainstorm ideas, organizers.
	What is the process for writing?	Develop a plan with steps.
	How do I initiate a research project?	Narrow topic, locate info.
	How do I reference suitable sources?	Cite work, write bibliography.
	How can I comprehend while I read?	Ask questions, summarize.
	What do I do with unfamiliar vocabulary?	Use word analysis, look it up.
	How do I begin to read a chapter in a text?	Skim, scan and chunk text.
	How do I learn how to use a textbook?	Learn layouts and purposes.
	What do I do if the text is too difficult?	(1) Use visual aids in text. (2) Get the main ideas. (3) Partner up, seek help.
	Self-Evaluation	
	How do I check my work?	Revise/edit, self or peer.
	How do I overcome challenges?	Keep positive thinking.
	How can I improve the quality of work?	Use your best effort.
	Do I understand the content?	Clarify, ask questions.
	Am I paying attention in class?	Participate, collaborate.
	How can I avoid falling behind?	Complete and turn in all work.
	When do I seek help?	Try first, then ask to clarify.
	Staying Ahead	
	How can I be a better test taker?	(1) Know material covered. (2) Study for exams. (3) Use test taking tips.
	How can I find my strengths and weaknesses?	(1) Check quality of work. (2) Review tests, grades. (3) Conference with teacher.
	How can I improve my work?	Practice weak skills, tutoring.
	How can I do better in school?	(1) Set attainable goals. (2) One step at a time. (3) Celebrate success.
	How do I keep a positive self-image?	(1) Take pride in accomplishments. (2) Be determined, believe you can do it. (3) Know you're not alone. (4) Keep a positive attitude.

knowledge, and (5) reference cohesion (placement of pronouns and their antecedents). All texts vary in the quality of the writing, and if text structure features such as text coherence affect comprehension, it follows that consideration of these same text features should be important in the selection of ma-

terials that are used with English language learners. Students who comprehend more of what they read will have more to discuss.

Materials for content instruction need to reflect relevant grade-level content standards and provide opportunities for practice through diverse learning modalities. A variety of materials can be used for content learning, including state-adopted textbooks, trade books, realia, manipulatives, charts, posters, models, audiocassettes, videotapes, software, Laser disks, CD-ROMs, slides, maps, globes, laboratory kits, and overhead transparencies. It is necessary for books to support English language instruction with well-illustrated visuals and graphics. Content materials should have simple layouts that facilitate reading and attract the reader's eye to the main points. The typeface should be appropriate to the grade level—not too big, not too small depending on the age of the reader. Boldface captions and titles appeal to students, make the reading easier, and guide students through text. Materials should be free of cultural bias.

Classroom texts for English language learners should be of the same quality—with respect to both content and appropriate-level readability—as materials for the regular program. Unfortunately, classroom materials for content instruction are not always written for English language learners; some are standard textbooks adopted for the regular classroom. These textbooks, of course, present materials in a fashion suitable for mainstream instruction, without paying attention to the needs of diverse populations. Newer editions may have references on how to modify instruction for English language acquisition by providing strategies for enhancing comprehension. When subject matter is taught to English language learners, they must learn how to apply effective comprehension skills to the expository formats found in textbooks.

Publishers must give more attention to the creation of at least one teacher and one student component—among the myriad of ancillaries that usually accompany a content textbook—to address the needs of English language learners. There are simply too many teachers that need specific, explicit, and systematic instruction available to them for the varying levels of language acquisition that their students represent. Therefore, publishers should assume the responsibility for providing a supplemental student and teacher component that would incorporate many of the recommendations made in this chapter and in the other chapters in this volume for instruction of English language learners.

Concluding Remarks

Instructing English language learners in content areas continues to pose demands and challenges in classrooms across the United States. The increase of linguistic diversity and the wide range of literacy skills affect the manner in which content

instruction is taught across the grade levels. It is extremely difficult to meet the academic needs of the English language learners by merely combining teacher lectures with textbook readings and activities. Therefore, planning and implementation of more effective strategies are needed to assist students in developing the language and academics of the content area. The degree of complexity of academic demands continues to escalate as linguistic and cognitive accountability are set for English language learners by state norms and standards. Curricular materials must align selections and lessons to state frameworks and continue to increase the rigor of academic complexity regardless of the students' level of English proficiency or knowledge of content background. For many English language learners, content instruction is now a moving target of opportunities for curricular access and success in school.

This chapter presented strategies and ideas to optimize the education of English language learners in subject-matter instruction through the discussion of four key instructional dimensions. Various elements woven through content learning can increase mastery of expository texts inclusive of subject vocabulary development, presentation of text features, strategies for comprehension, and cognitive thinking skills. Communicative-based instruction models that incorporate the teaching of English language structures and language conventions through purposeful application and comprehension of content lessons are appropriate and encouraged. The cognitive progression from practical to theoretical thinking provides meaningful constructs for concept learning. The research that supports effective instructional approaches for English language learners advocates learning from experiential activities to build a knowledge base for abstract thought. Researchers support helping students conceptualize new information through the use of concrete materials, embedding language objectives in content learning, and graphically organizing the thought processes. If English language learners can receive the tools for learning, then there should also be opportunities to succeed in school by learning adequate study skills along with language and content instruction. Finally, publishers must work to support teachers and students as they create textbooks that are the primary source of information used in content instruction.

REFERENCES

Bandura, A. (1977). *Social learning theory*. Englewoods Cliffs, NJ: Prentice-Hall.

Beck, I.L., & McKeown, M.G. (1988). Toward meaningful accounts in history texts for young learners. *Educational Researcher*, *17*, 31–39.

Beck, I.L., McKeown, M.G., & Gromoll, E.W. (1989). Learning from social studies texts. *Cognition and Instruction*, *6*, 99–158.

Beck, I.L., McKeown, M.G., Omanson, R.C., & Pople, M.T. (1984). Improving the comprehensibility of stories: The effects of revisions that improve coherence. *Reading Research Quarterly*, *19*, 263–277.

Beck, I.L., McKeown, M.G., Sinatra, G.M., & Loxterman, J.A. (1991). Revising social studies text from a text-processing perspective: Evidence of improved comprehensibility. *Reading Research Quarterly*, *26*, 251–276.

Bromley, K., Irwin-DeVitis, L., & Modlo, M. (1995). *Graphic organizers: Visual strategies for active learning*. New York: Scholastic.

Cloud, N., Genesse, F., & Hamayan, E. (2000). *Dual language instruction: A handbook for enriched education*. Boston: Heinle & Heinle.

Cummins, J. (1979). Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism*, *19*, 121–129.

Cummins, J. (1981). The role of primary language development in promoting educational success for language minority students. In California State Department of Education (Ed.), *Schooling and language minority students: A theoretical framework* (pp. 3–49). Los Angeles: Evaluation, Dissemination, and Assessment Center, California State University.

Cummins, J. (1987). Bilingualism, language proficiency, and metalinguistic development. In P. Homel, M. Palij, & D. Aaronson (Eds.), *Childhood: Aspects of linguistic, cognitive, and social development* (pp. 57–73). Hillsdale, NJ: Erlbaum.

Fillmore, L.W., & Snow, C. (2000). *What teachers need to know about language*. [Special report from ERIC Clearinghouse on Languages and Linguistics.] Available at http://www.cal.org/ericcll/teachers/teachers.pdf.

Gall, M.D., Gall, J., Jacobsen, D., & Bullock, T. (1990). *Tools for learning: A guide to teaching study skills*. Alexandria, VA: Association for Supervision and Curriculum Development.

García, G.G. (1994). *Effects of text coherence and English language proficiency on the comprehension of fifth grade students*. Unpublished doctoral dissertation, University of California at Los Angeles.

Genesse, F. (1994). *Integrating language and content: Lessons from immersion. Educational Practice Report No. 11*. Santa Cruz, CA: The National Center for Research and Cultural Diversity and English Language Learning.

Gersten, R., & Baker, S. (2000). What we know about effective instructional practices for English-language learners. *Exceptional Children*, *4*, 454–470.

Jones, B.F. (1986). Quality and equality through cognitive instruction. *Educational Leadership*, *43*(7), 4–11.

Krashen, S.D. (1982). Theory versus practice in language training. In R.W. Blair (Ed.), *Innovative approaches to language teaching* (pp. 15–30). Rowley, MA: Newbury House.

Krashen, S.D. (1985). *The input hypothesis: Issues and implications*. White Plains, NY: Longman.

Mohan, B. (1986). *Language and content*. Reading, MA: Addison-Wesley.

Pérez, B., & Torres-Gúzman, M. (1996). *Learning in two worlds*. White Plains, NY: Longman.

Piaget, J. (1959). *The language and thought of the child*. London: Routledge & Kegan Paul.

Schmeck, R.R. (1988). Individual differences and learning strategies. In C.E. Weinstein, E.T. Goetz, & P.A. Alexander (Eds.), *Learning and study strategies: Issues in assessment, instruction, and evaluation* (pp. 171–191). San Diego, CA: Academic Press.

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds. and Trans.). Cambridge, MA: Harvard University Press. (Original work published 1934)