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Research-Based Writing

WRITING ACROSS THE CURRICULUM SERIES

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Writing across the curriculum provides an opportunity for students to engage in two types of learning at the same time. By writing about content-area topics, students learn, think, and remember more about a subject area, while also demonstrating their knowledge and progress in that area. Simultaneously, writing about content-area topics helps students develop and practice a range of literacy skills, which include expanding their vocabulary and improving their comprehension.

Extensive research supports the use of writing across the curriculum to improve both literacy and content-area learning. To help students take full advantage of these opportunities, the Writing across the Curriculum series developed by Modern Learning Press enables students to create their own content-area books, which are designed to supplement and enhance a school district's content-area curriculum. The process of creating their own books integrates content-area learning with the language arts in a comprehensive and systematic way, while also prompting greater personal involvement and ownership of the material.

To encourage personal involvement and ownership of the material, all the books in the series feature space for the student's name on the front cover. The social studies and science books also have dedication pages and "About the Author" pages. Many of the books have wordbanks on the inside back cover, so students can create personal vocabulary/spelling references right inside. All of the books have grade-appropriate writing lines for student compositions, and most also have spaces for illustrations or graphic organizers that support and enhance students' writing.

The Writing across the Curriculum series coordinates with social studies with *My Guide to Current Events* for grades 4–6, *My American GeoJourney* for grades 2–5, *My Worldwide GeoJourney* for grades 3–6, *My Guide to America's Westward Expansion* for grades 4–6, *My Guide to the American Revolution* for grades 4–7, *My Guide to the Civil War* for grades 6–8, *My Guide to Our Community* for grades 2–3, *My Guide to Our State* for grades 3–4, and *My Guide to the U.S.A.* for grades 4–6. *My Math Journal* for grades 3–4 supports math. *My Guide to the Ocean* for grades 4–6, *My Guide to Our Weather* for grades 2–3, and *My Guide to Our Solar System* for grades 2–3 support those science units.

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By using these formats and features to create their own books, students not only expand and enhance their learning about content-area topics, they also document what they are learning in ways that can help them meet state standards. Moreover, students continually practice composing the types of written responses needed to succeed on content-area tests. At the same time, they are also practicing and improving specific literacy skills, such as vocabulary usage, spelling, grammar, punctuation, and handwriting.

For these reasons, writing across the curriculum has become a widely accepted approach starting in the primary grades and continuing through college—a substantial body of research supports this approach.

Reading, Writing, and Learning across the Curriculum

The textbook has been assumed to be the centerpiece for learning throughout our educational system, particularly in content areas such as math, science, and social studies (Elliot, 1990). However, according to Beck, McKeown, Hamilton and Kucan (1997), large numbers of students are simply not getting much meaning from the expository texts they read. The findings of Chall and Conard (1991) and Kinder, Bursuck, and Epstein (1992) suggest the reason for this gap is that many of the content-area texts were written a year or more above grade level.

The National Research Council (Snow, Burns & Griffin, 1998) concluded that: “The educational careers of 25 to 40 percent of American children are imperiled because they do not read well enough, quickly enough, or easily enough to ensure comprehension in their content courses in middle and secondary school.” Schoenbach, Greenleaf, Cziko, and Hurwitz (1999) say that this is sometimes called the “quiet crisis,” or the inability of many students to cope with their academic texts.

Students’ inability to learn what they need from their content-area texts has three main causes, all of which are

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addressed by the Writing across the Curriculum series. Gunning (2002) found that students who are able to cope with their basals or novels may still have difficulty with content-area texts because of the increased vocabulary and the density of concepts. Research findings also indicate a strong link between text comprehension and the way expository text is organized (Seidenberg, 1989; Pearson & Fielding, 1991). In addition, Zabrocky & Ratner (1992) found that students remember and comprehend narrative text structure more easily than they do expository text structure.

All of the books in the Writing across the Curriculum series have wordbanks where students add and then refer to content-area vocabulary words, either on pages next to their writing pages and/or on the inside back covers of the books. Numerous studies (Rapp-Rudell & Shearer, 2002; Blachowicz, Fisher, Costa & Pozzi, 1993; Haggard, 1986) have shown that student self-selection of vocabulary words is a valid and successful means of learning words and building a vocabulary. Moreover, research has shown that in order to learn words and understand their meaning successfully, students need multiple exposures to the words in meaningful contexts (Rosenbaum, 2001; Dole, Sloan, & Trathen, 1995). Armbruster (2002) also found that repeated exposures to words in many contexts improve word learning, as does instruction that promotes active involvement with vocabulary.

By creating their own vocabulary lists and then using those words while writing about content-area topics, students using the Writing across the Curriculum series are obtaining multiple exposures to vocabulary words within meaningful contexts that the students are actively engaged in creating. This approach is also supported by the National Council of Teachers of English (NCTE) in a series of papers entitled *What We Know About Writing* (2003), which includes the statement, "Language learning proceeds most successfully when students use language for meaningful purposes."

To cope successfully with the density of concepts found in content-area of texts, students need to focus their thinking

By creating their own vocabulary lists and then using those words while writing about content-area topics, students are obtaining multiple exposures to vocabulary words within meaningful context.



and take time to process what they are learning. Writing across the curriculum helps students with both these tasks. Tierney's (1990) research indicated that when reading and writing occur together, evaluative thinking and perspective shifting increase. Other research findings suggest that writing may have an advantage over other learning adjuncts in the extent to which learners focus on significant ideas (Copeland, 1987; Hayes, 1987). Writing also prompts readers in the thoughtful exploration of issues, whether in the context of science, social studies, or literature (Barr, et. al., 1991).

By thinking about what they have read, organizing their thoughts, and then expressing their ideas through written words, students are actually learning how to construct meaning from their readings. As Squire (1983) points out, "Composing is critical to thought processes because it is a process which actively engages the learner in constructing meaning, in developing ideas, expressing ideas. To possess an idea that one is reading about requires competence in regenerating an idea, competence in learning how to write the idea of another."

As to the way expository text is organized, students' use of the Writing across the Curriculum books enables them to organize and write their own expository text in ways similar to that which they are reading, increasing their familiarity with and understanding of the five primary expository text structures:

- cause and effect
- compare and contrast
- description
- problem and solution
- time order

The open-ended structure of the social studies and science guides are particularly helpful in this regard, because students can repeatedly practice their written use of these text structures. In addition, students can then repeatedly read



what they (and their classmates) have written. This enables them to practice reading text structures that contain vocabulary and concepts they can actually comprehend. Further, the process of thinking, writing, and reading about a topic facilitates learning and memorization by providing repeated exposures, active engagement, and a meaningful context.

The benefits of linking content-area reading and writing are not just limited to solving comprehension problems. Armbruster (1991) says that one problem with content area teaching is how students and teachers use textbooks, in that traditionally the curriculum is determined by the textbook in the classroom, whether it be in social studies, science, or math. The typical student reads a chapter from science or social studies but is not actively engaged in learning how to make inquiries about topics, or taught how to think like a historian or scientist (Fredricks, et. al. 1997). By compiling research and then writing about their findings, users of the *Writing across the Curriculum* series are actively engaged in historical and scientific research and reporting, which expands and reinforces their content-area learning.

Today, many teachers conduct units of study that integrate all modes of learning. Hennings (2002) contends that it is important for youngsters to have an opportunity to write as part of their unit study in content areas, because writing is a process that requires students to consider their reading material and thoughts, identify relationships, organize ideas logically, and communicate those ideas effectively. These are important content-area skills, and Hennings goes on to say that in teaching reading, both writing and reading are fundamental strategies, especially when used in concert.

The types of writing that support content-area learning have also been studied, and the *Writing across the Curriculum* series supports three key types. Books containing these types of student writing may be referred to as “journals,” “learning logs,” and “study guides,” and although the



terms are sometimes used interchangeably, technically there are important differences:

- Writing in journals can be free flowing, subjective, and personal.
- Writing in learning logs should be concise, objective, and factual.
- Writing in study guides focuses on key concepts and facts needed for test preparation.

The open-ended format of the social studies and science books in the Writing across the Curriculum series accommodates and supports all three types of writing. Students can create journal entries such as personal reactions, fiction, or poetry; or students can organize and write observations, essays, or articles; or students can summarize key concepts and facts. (Even the illustration areas can accommodate impressionistic artwork, accurate diagrams, or outlines and timelines.) And research shows that all these approaches support content-area learning.

Anders and Guzzetti (1996) recommend the use of journals in content area study so students can record their questions, reactions, and thoughts. This, the researchers said, allows students to formulate and share their own responses to books by creating text that has personal meaning, whether expository or narrative. *My American GeoJourney* and *My Worldwide GeoJourney* explicitly support this approach by including “GeoJourney Journal” sections where students can do either expository or narrative writing.

Used as learning logs, the Writing across the Curriculum books give students a thematic structure and page formats that support organizing, thinking, and writing. Atwell (1990) claims that the main purpose of learning logs is to have students examine and express what they are learning, rather than airing personal matters. And according to Gunning (2002), the major advantage of learning logs is that they provide students with the opportunity to reflect on their learning and raise questions about concepts that puzzle them or issues that are of concern.



Research has also shown that the use of study guides helps students set and achieve goals as they read content texts (Armbruster, Anderson & Osterlag, 1989; Wood, Lapp & Flood, 1992). The titles and formats of the *My Guide...* books in the series clearly support this process in that creating their own guides to important content area topics enables students to decide what is important, assemble and learn key facts, and develop and express their thoughts in writing. This also helps with test preparation, as students not only practice creating the types of written responses required on many content-area tests, but also can study what they have written, knowing the information is presented at a level and in a way they can comprehend. Continually reading, thinking, and writing in this way help students learn to employ the variables cited by Kletzien and Bednar (1988) as necessary for taking control of their own studying:

- knowing oneself as a learner
- setting goals
- assessing tasks
- employing thinking processes and strategies

Use of the Writing across the Curriculum books also extends learning beyond simply reading, remembering, and repeating what was read. Today, leading educators understand that true learning results in students being able to use or apply their knowledge in some way. This requires a deeper understanding that includes making inferences or taking a course of action based on what one has read. Yet Keys (1999) found that middle school students' writings generally contained few inferences. Students could list facts and observations they made, but they did not relate the facts or observations to new hypotheses or knowledge claims. This finding was supported by Warwick, Linfield, and Stephenson (1999), who found little in students' writing about investigations to show understanding of concepts or evidence. With help from their teachers, students using the Writing across the Curriculum books can practice applying

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what they have learned when writing about different topics, as well as make written inferences and link supportive evidence to new ideas.

In addition, Maxwell (1996) contends that writing can be a powerful means of evoking the types of critical thinking necessary for success in real-world situations, but allowing for frequent, individual internalization and application of concepts is required to achieve the result. Noyce and Christie (1989) point out that writing enables learners to access knowledge they already hold.

Despite the benefits of content-area writing, research shows that many content-area teachers have not used writing to increase student involvement and learning in their subject areas. In an investigation of the writing required of high school students by content field, Applebee (1981) found that most writing assignments were given to measure rather than promote learning. He also found that only three percent of the writing tasks involved the production of anything longer than a sentence. This investigation was done well after Emig's (1977) research, in which Emig cited Bruner, Vygotsky, and Luria in describing writing as a unique mode of learning that corresponds to some of the most effective strategies. Applebee concluded, based on his research, that students need more situations in which writing can serve as a tool for learning rather than as a means of displaying acquired knowledge, and that writing in the content areas worked best as a learning experience when:

- Students assumed an active role in their own learning.
- The teacher encouraged students to explore and discover.
- Students' own experiences were fully incorporated into class discussions.
- Students were enthusiastic about their work.



- Writing was viewed as a means of learning that emerged naturally out of other activities.

The Writing across the Curriculum series supports these practices, as well as the thinking of Maxwell, Noyce, and Christie. The books provide space for students to explore and discover through the compilation of research and vocabulary, and to engage in active illustrating, thinking, organizing, and writing about topics that are also covered through other classroom activities. The students can then read and discuss their books in class, generating feelings of pride, enthusiasm, and “ownership” of the material that are also fostered by features such as an “About the Author” page.

The integrated and interdisciplinary curriculum movement of the late 1980s has helped change the way writing is viewed in many content-area classrooms across the country (Jacobs, 1989). There appears to be more recognition today that content-area writing enhances the learning process for the student, in addition to providing valuable diagnostic information for the teacher.

Writing and Learning about Social Studies

Learning in the social studies content area relies heavily upon the ability of students to read for information, grasp the facts, and think beyond them (Noyce & Christie, 1989). By integrating writing with the social studies reading process, students can be served in two ways: (1) Writing helps clarify the meaning of textbook material, promoting understanding of concepts and generalizations; and (2) writing is a catalyst for higher level thinking (Noyce & Christie, 1989). As explained in the preceding section, the Writing across the Curriculum series enables students to do the types of writing, organizing, and thinking that facilitate comprehension of textbook material and higher-level thinking.

In its curriculum guidelines, the National Council for the Social Studies (NCSS) emphasizes that a social studies

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program should be challenging and active, stating:

- The social studies program should provide students with challenging content, activities, and assessments.
- The program should provide students with the opportunity to formulate oral and written responses to content-based questions and issues.
- The program should include in the evaluation process an assessment of progress not only in knowledge but also in skills and abilities.
- The social studies program should engage the student directly and actively in the learning process.
- The program should provide a wide and rich range of learning activities. The program should offer students opportunities to formulate hypotheses and test them by gathering and analyzing data

The Writing across the Curriculum books clearly provide a range of opportunities for students to engage in active learning, gather and analyze data, and respond in writing to content-based questions and issues. Moreover, by preserving each student's writing as a single collection created over time, the books serve as "authentic assessments" that document progress in knowledge, skills, and abilities.

The NCSS has also identified ten themes that provide a framework for the integration of national standards in social studies. These themes are reflected in the social studies content standards developed by many states. At the elementary level they include the study of a student's community and state, as well as of the nation as a whole and key historical periods such as the American Revolution and America's westward expansion. Current events and world geography are included in many state standards for elementary social studies. Related NCSS themes include:

- Culture
- People, places, and environments

The Writing across the Curriculum books clearly provide a range of opportunities for students to engage in active learning, gather and analyze data, and respond in writing to content-based questions and issues.



- Individuals, groups, and institutions
- Global connections
- Time, continuity, and change
- Power, authority, and governance

The Writing across the Curriculum series provides overlapping series of social studies books that involve students in learning about key topics and themes. In the *My Guide...* series covering the community, state, and United States, students research and write about topics such as “The Land and Water in Our Community,” “Famous People from Our State,” and “The President and Executive Branch.” *My American GeoJourney* and *My Worldwide GeoJourney* include sections on Landforms and Natural Wonders of the World, respectively, as well as opportunities to work with maps and write about states, regions, countries, and continents. The historical *My Guide...* series engages students in writing about topics such as “Patriots and Loyalists,” “Turning the Plains into Farmland,” and “Civilian Life During the War.” *My Guide to Current Events* focuses students on responding to national and international events during a specific time period, as well as reviewing cultural artifacts such as books and movies.

The processes involved in preparing these types of writing are strongly supported by the formats of the books and by independent research. For example, the open areas for illustrations or research notes in the books can also be used to create graphic organizers, and Wood and his co-authors (1995) found that graphic organizers highlight how ideas are interpreted, help students understand the most important ideas presented, and facilitate the recall of information. Research has also shown that taking notes is preferable to highlighting, because in taking notes we think more deeply about the information, so we understand it better and remember it longer (Carlson & Buskist, 1997).

Wittrock’s (1983) research on generative reading showed that retention and comprehension of text increased significantly when students were asked to generate a summary



sentence for each paragraph they read. And students who were given paragraph headings to use in their summary sentences doubled their comprehension and retention. Not only do the left-hand pages in the *My Guide...* books provide space for research notes, but the right-hand pages feature topic headings that students can use in their summary sentences.

More generally, a thesis well accepted among psychologists is that the more content is manipulated, the more likely it is understood and remembered (in Barr, et. al., 1999). And according to Cooper (1997), learning across the curriculum is interactive, allowing the students to construct meaning through a variety of problem-solving experiences that use many types of literature and resources.

In many states it is recommended that students read and respond to historically or culturally significant works of literature that reflect and enhance their studies of history and social science (CORE, 2000; Reeves, 2001). Students can also gather information from the Internet, refer to original documents, use film and videos, read plays, listen to music, and examine old photographs from that time period. The open-ended format of the Writing across the Curriculum series provides ample opportunity for students to respond to literature and varied information sources with expository writing or creative efforts of their own.

Hennings (2002) recommended that students, especially in the upper grades, write research reports. The Writing across the Curriculum series provides a thematic framework and ample practice for students to develop their report writing skills. This framework also complements the recommendations for teaching reading in the content areas, such as establishing key ideas, preparing to read, guided reading, and rereading, followed by extending and applying what has been learned (Gunning, 2000).

The open-ended format of the Writing across the Curriculum series provides ample opportunity for students to respond to literature and varied information sources with expository writing or creative efforts of their own.



Writing and Learning about Science and Math

Significant research also supports the use of writing to help students comprehend their science and math textbooks, expand and improve their learning, and document their accomplishments. As Squire (1983) states, “The skills required in writing science can be learned by writing science. A child who writes in a content area subject acquires the basic vocabulary of the subject. Practice in writing in subject areas will contribute strongly to performance in reading and thinking.”

According to Kober (1993), when students are asked to write about their observations, results, reasoning processes, or attitudes, they are forced to pay closer attention to details, organize data more logically, and structure their arguments in a more coherent way. In the process, they clarify their own understanding. Requiring students to write in the content areas of science and mathematics has long been recommended as a tool to enhance concept development (Abell, 1992; Ammon & Ammon, 1990; National Council of Teachers of Mathematics (NCTM), 1989, 2000, 2003).

Further, Hand, Prain, Lawrence, and Yore (1999) state that: “Writing in an interactive-constructivist science classroom has great potential to enhance learning. Writing in science is conceptualized as a process that develops reasoning, inducts students into the discourse of science, and promotes personal meaning making in relation to scientific explanations. Writing in science can serve to engage students’ prior knowledge, facilitate explorations of alternative ideas or reveal new possibilities, consolidate new concepts into prior understanding or integrate divergent concepts, and assess understanding, reasoning, and argumentation.”

The Writing across the Curriculum series includes three science books: *My Guide to Our Solar System* (grades 2–3), *My Guide to Our Weather* (grades 2–3) and *My Guide to the Ocean* (grades 3–5). All of these books provide areas

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for illustrations or diagrams, as well as age-appropriate writing lines, space for research notes, and vocabulary word banks. There are also features such as a dedication page and “About the Author” page that promote feelings of accomplishment and “ownership” of the material. The format and topics of these books clearly help students acquire and correctly use scientific vocabulary, activate and expand prior knowledge, organize information logically, and improve their understanding of concepts.

The National Science Teachers Association provides support for this approach in its Position Statement on Elementary School Science (2002), which includes the following points:

Elementary school students learn science best when—

- Mathematics and communication skills are an integral part of science instruction.

Elementary school students value science best when—

- A variety of presentation modes are used to accommodate different learning styles.
- Other subject areas are infused into science.

To help students with mathematics, the *Writing across the Curriculum* series includes *My Math Journal*, which has a unique format designed to help intermediate students solve word problems, learn and use math vocabulary, and improve their understanding of mathematical concepts. In addition to the NCTM’s support for writing about math, which was referenced earlier in this section, Haley-James (1982) noted that, “Writing in math class pays dividends as well by raising the level of cognitive activity and increasing students’ understanding of mathematical concepts. Among the benefits of writing that make it an appropriate skill to integrate with other math instruction are focused thought, making thought available for inspection, and translating of mental images.”

According to House (1996), short and well-defined writing tasks are one form of writing that helps students to develop a deeper understanding of mathematical topics.



And Graves (1978) maintained that children are unable to fully comprehend word problems in math until they have written examples of their own. To help students with these processes, *My Math Journal* has a journal page format that starts with students writing the problem in order to help them focus on and consider the specific wording. They then have an open space for calculations or other “visual thinking,” followed by lines for a written explanation of their solution. In addition, the last page and inside back cover provide a math word list and blank lines for additional vocabulary, so students have a personalized reference right inside their journals.

The National Council of Teachers of Mathematics (2000) included the following statements in their Standards and Principles:

- Solving problems is not only a goal of learning mathematics but also a major means of doing so....Students require frequent opportunities to formulate, grapple with, and solve complex problems that involve a significant amount of effort.
- When students are challenged to communicate the results of their thinking to others orally or in writing, they learn to be clear, convincing, and precise in their use of mathematical language.
- When students connect mathematical ideas, their understanding is deeper and more lasting, and they come to view mathematics as a coherent whole. They see mathematical connections in the rich interplay among mathematical topics, in contexts that relate mathematics to other subjects, and in their own interests and experience.
- Mathematical ideas can be represented in a variety of ways: pictures, concrete materials, tables, graphs, number and letter symbols, spreadsheet displays, and so on. The ways in which mathematical ideas are represented is fundamental to how people understand and use those ideas.



My Math Journal supports these standards and principles by providing a uniquely effective format for problem solving, helping students communicate the results of their thinking, and enabling students to connect and represent mathematical ideas in a variety of ways.

Learning the Language Arts by Writing across the Curriculum

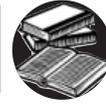
In addition to helping students learn content-area information and develop related skills, research also confirms that students can improve their writing and other language arts skills through the approach used in the *Writing across the Curriculum* series.

As noted earlier in this paper, all of the books in the *Writing across the Curriculum* series have wordbanks where students list and refer to vocabulary words, either on pages next to their writing pages and/or on the inside back covers of the books. And numerous studies (Rapp-Rudell & Shearer, 2002; Blachowicz, Fisher, Costa & Pozzi, 1993; Haggard, 1986) have shown that student self-selection of vocabulary words is a valid and successful means of learning words and building a vocabulary. While content-area vocabulary development is needed in order to comprehend content-area text, the ability to understand, use, and spell these words correctly also contributes to students' overall ability to read and write fluently and accurately. It also helps students work with specific types of literature, such as historical fiction, science fiction, and biography.

In a similar way, the types of content-area writing students do in their books provide valuable practice in composing well-written paragraphs in various genres, from essays to imaginative fiction. And by practicing and improving their ability to use the five primary types of expository text structure mentioned earlier, students are developing skills and understanding that can and should be applied to writing about literature.

The format of the *Writing across the Curriculum* books can also contribute in other ways to students' mastery of the

Student self-selection of vocabulary words is a valid and successful means of learning words and building a vocabulary.



language arts. Use of the books' word lists, for example, can help students improve their knowledge of correct spelling, which not only makes writing easier and more fluent but also helps students read more accurately and easily. The word lists enable students to look up the correct spelling of relevant words frequently and thereby get into the habit of spelling the words correctly while in the midst of writing. According to Zutell (1978), active involvement in the process of learning to spell results in better learning, and Ehri (1989) suggested that the more students practice, the more words they will be able to spell correctly.

As Gunning (2002) states, writing provides a reason for learning to spell, along with opportunities to apply this skill. In contrast, Bos & Vaughn (1991) found that most spelling programs placed little emphasis on maintenance of previously learned words, and that there was little support for ongoing transfer of correct spelling in activities beyond the specific spelling lesson. Unlike programs of this sort, the Writing across the Curriculum series provides reasons and ongoing opportunities to maintain and apply spelling knowledge.

The National Council of Teachers of English, in its series of papers entitled *What We Know About Writing* (2003), identifies the following principles as a basis for the development of students' writing:

- The "language arts" develop in concert. Drawing supports writing, writing supports reading; opportunity to use multiple expressions of language increases language learning and ability.
- Language learning proceeds most successfully when students use language for meaningful purposes.
- Writing is effectively used as a tool for thinking and learning throughout the curriculum.
- Language skills conventions (grammar, punctuation, spelling) are most successfully learned with a combination of carefully targeted lessons applied within the context of meaningful writing.



- Experience with a particular kind of writing is the best indicator of performance; extensive reading and writing within a particular genre or domain increases successful performance.
- Assessment that both benefits individual writers and their teachers' instructional planning is embedded within curricular experiences and represented by collections of key pieces of writing created over time.

The books in the Writing across the Curriculum series align well with these principles of writing instruction, starting with the appropriately sized spaces for illustrations or other visual aids. The preparation of illustrations or visual aids often serves as a helpful prewriting activity for students. In addition, Gardner's theory of multiple intelligences (1985, 1991) made educators more aware that our schools mainly prize linguistic and logical-mathematical abilities. For those students whose spatial intelligence may dominate the linguistic, the drawings, maps, charts, or diagrams may help overcome the block to writing.

Rather than using the illustration or research areas in this way, students also have the option of using them for graphic organizers. Studies have shown the effectiveness of using graphic forms such as semantic feature charts (Anders, Bos, & Filip, 1984), advanced organizers (Herber, 1978), or maps and webs (Heimlich & Pittman, 1982). Some students prefer to draw or use Venn diagrams, time lines, bar or line graphs, concept ladders or semantic gradients (Blachowicz, 1986) or a thinking tree (Nagy, 1988). The Writing across the Curriculum books give students the flexibility to choose the strategy most meaningful to them.

To make language learning meaningful, students using the books can write personal responses to what they are learning. This helps them learn to express themselves in writing and engages them in writing in meaningful ways. Yet the open-ended format of the books also facilitates the types of expository writing previously noted, so the students gain



experience with particular genres and domains that leads to successful performance.

Over time, the writing collected in the Writing across the Curriculum books serves as an authentic assessment or portfolio that documents learning progress. On a short-term basis, daily or weekly writing reveals which specific language conventions students are mastering, and which ones need further instructional support and practice. The self-selected word collections students compile in the wordbanks also provide valuable information about students' thinking and progress, as do the paragraphs, essays, and other forms of extended writing.

The National Commission on Writing in America's Schools and Colleges (2003) recently identified the need for a "writing revolution" in our educational system. Based on its research, the Commission recommended that:

- The amount of time and resources devoted to student writing should be at least doubled.
- Writing should be taught in all subject areas and at all grade levels.

The Commission goes on to state: "We strongly endorse writing across the curriculum. The concept of doubling writing time is feasible because of the near-total neglect of writing outside English departments. In history...mathematics...science...and social science, all students can be encouraged to write more, and to write more effectively."

Clearly, the Writing across the Curriculum series can be a supportive and valuable part of this process.

Conclusion

The Writing across the Curriculum series helps students develop both content-area knowledge and skills and language arts, in approaches based on research. Moreover, the books' formats and opportunities for self-selection engage students in active learning and generate feelings of ownership of the material, which also contribute to the series' effectiveness.

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