Engaging Adolescents With LD in Higher Order Thinking About History Concepts Using Integrated Content Enhancement Routines

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Abstract

The understanding and use of historical concepts specified in national history standards pose many challenges to students. These challenges include both the acquisition of content knowledge and the use of that knowledge in ways that require higher order thinking. All students, including adolescents with learning disabilities (LD), are expected to understand and use concepts of history to pass high-stakes assessments and to participate meaningfully in a democratic society. This article describes Content Enhancement Routines (CERs) to illustrate instructional planning, teaching, and assessing for higher order thinking with examples from an American history unit. Research on the individual components of Content Enhancement Routines will be illustrated with data from 1 of the routines. The potential use of integrated sets of materials and procedures across grade levels and content areas will be discussed.

Increased academic standards in core content areas pose significant challenges for students at all levels. These challenges are often greatest for adolescents who have arrived in secondary schools with a large gap between the curriculum demands that they are expected to meet and their ability to meet those demands due to deficits that they evidence in key skills and strategies (Bulgren et al., 2006; Deshler et al., 2001). Whereas the challenges are sizeable now, they are expected to grow even more stringent in coming years. For example, the American Diploma Project Network (Achieve, 2006; see Note) is a coalition of states committed to significantly increasing expectations for high school students to provide them with a greater chance of succeeding in post-secondary education and the world of work.

The pressures to “raise the bar” for adolescents have also been supported by a spate of reports on high school reform (e.g., National Governors Association, 2005) and descriptions of the unfavorable consequences facing the U.S. economy and ultimately the quality of life in the United States due to the explosive gains made in the economies of such countries as China and India (Friedman, 2005; National Academies, 2006). As a result, curricular demands that students face in general education classes are becoming more voluminous and complex (Deshler, Schumaker, Bui, & Vernon, 2006).

As the volume and complexity of information increase, so too do the expectations for students to engage in higher order thinking and problem solving (Kame'enui & Carnine, 1998). By the time students reach adolescence, they are expected not only to know—or have the skills to acquire—critical facts and concepts in subject matter classes, but also to use those facts, concepts, and prior knowledge in ways that require higher order thinking (Kamil, 2003). Higher order thinking involves the manipulation of information, such as categorizing, comparing and contrasting, determining causes and effects, weighing options, explaining “big ideas” in a subject, and inquiring into and answering critical questions; the generalization of ideas to solve problems using inference or prediction; and the construction of new perspectives and understandings. Yet many teachers in secondary inclusive content classes are not confident that their students can successfully master those higher order thinking requirements; this is particularly true of teachers’ expectations for students with disabilities (Bulgren et al., 2006).

The purposes of this article will be to (a) explain how history standards established by professional associations and state assessments emphasize higher order thinking; (b) describe the challenges of engaging adolescents with learning disabilities (LD) in higher order thinking in history; (c) describe a curriculum framework, planning process, and instructional procedures to enable secondary subject matter teach-
ers to successfully engage all students (including those with disabilities) in higher order thinking; (d) provide examples of these instructional practices from a unit on the Civil War in an American history course; and (e) present a research paradigm and the results of a study designed to test the efficacy of this approach with adolescents.

Higher Order Thinking in History Standards

In 1996, the National Center for History in the Schools (NCHS) set forth standards to guide the development of assessments and the design of history curricula. These standards call for students in secondary content classes to think about complex issues and engage in challenging tasks within the discipline of history. Many of these expectations involve higher order thinking in addition to the acquisition of historical facts and concepts. These standards require students to formulate historical questions, interrogate historical data, draw comparisons, determine cause-effect relationships, analyze the influence of ideas, and make decisions based on various data sets (NCHS, 1996). Therefore, these standards call for a high degree of critical thinking and reasoning for students in Grades 5 through 12. However, even students in kindergarten through fourth grade are asked to engage in tasks that require establishing temporal order, drawing on historical and visual data, distinguishing between past and present, formulating historical questions, comparing and contrasting, obtaining historical data, assessing importance, identifying issues and problems, and reading and constructing historical narratives. Knowledge of these standards sharpens our understanding about what is required of citizens in our world today to be considered literate.

The recent writings of curriculum and instruction innovators reflect the NCHS call for engaging learners in higher order work. For example, Daro (2005) has argued that an overarching goal of text use across subject matter areas is to shift the emphasis away from the knowledge of isolated facts to an understanding of the nature of inquiry, the importance of evidence-based claims, and habits of the mind specific to the discipline.

These processes, of course, require basic decoding and fluency literacy; facility with content knowledge of facts, concepts, vocabulary, procedures, principles, and propositions; manipulation and generalization of information; the ability to acquire additional knowledge from texts, media, and technology; and the competent application of cognitive and metacognitive strategic inquiry into critical questions. As a result of the extensive literacy demands in subject matter courses, it is important that subject matter teachers deliberately teach students how to think about and process information in their discipline for use in class, on assessments, and in real-life situations. As a result, this often means using content knowledge in ways that expand what is basic to being literate. Successfully teaching average-achieving (AA), high-achieving (HA), and low-achieving (LA) students is a challenge; however, accomplishing this with students with LD can be especially challenging, particularly in light of the limited planning time for some teachers. However, teachers have indicated that one of the ways they would likely spend extra time, if available, would be in activities that directly influence classroom actions, such as planning and redesigning curriculum (Bulgren et al., 2006).

Engaging Students With LD in Higher Order Thinking

Foundational to successfully teaching all students in academically diverse classes is having an understanding of the unique learning challenges associated with adolescents with LD and of the instructional context in secondary schools within which students and teachers function.

Learning Challenges

Both the No Child Left Behind Act (NCLB) of 2001 and the Individuals with Disabilities Education Act (IDEA) of 2004 (U.S. Department of Education, 2004) require that all students meet demanding standards. The result is often the presence of students representing a wide range of academic diversity (including students with LD) in rigorous secondary content classrooms to benefit from instruction from content experts (Andrews et al., 2000; Bay, Staver, Bryan, & Hale, 1992; Rea, McLaughlin, & Walther-Thomas, 2002). However, these students may have considerable difficulty with actively manipulating or transforming information, organizing and prioritizing information, differentiating major ideas from supporting information, comparing and contrasting information, reading and understanding large amounts of content information, relating their background knowledge to new information, holding large quantities of information in memory, and expressing information on tests and in papers (Deshler et al., 2001; Pressley et al., 1992). In fact, Deshler et al. and Pressley et al. suggested that students with LD may tend to focus on irrelevant or only remotely relevant information, rather than on the truly important information that they must know to succeed in an increasingly competitive world. These learner characteristics need to be carefully considered in light of the rigorous curricular demands that students are expected to meet. Furthermore, Newman et al. (2005) found that although adolescents with LD have access to the general education curriculum, the number of accommodations provided to these students decreases as they progress from middle school to high school. Indeed, Schumaker et al. (2002) found that many students with LD were not being educated in the context of general education classes to receive instruction.
from content experts to the extent required by NCLB and IDEA.

**Instructional Context of Inclusive Secondary Classes**

Bulgren et al. (2006) reported on the instructional context of secondary core content classes (i.e., math, science, history, foreign language, and English) that included students with disabilities. Specifically, this study examined the attitudes of subject matter teachers. Among the relevant findings were that these teachers (a) preferred to assume responsibility for showing students “how to learn” at the same time that they taught content, as opposed to having another teacher come into their classrooms in a co-teaching capacity to teach learning strategies to students; (b) reported that for HA and AA students, success in their classes depended most on mastery of content knowledge, whereas for students with disabilities, success depended most on their mastery of basic skills and strategies that would enable them to succeed in subject matter content; (c) reported that they had less confidence that students with disabilities would meet state standards than students without disabilities; and (d) held lower expectations that students with disabilities would be successful in learning content or in generalizing and applying the content to solve problems than would students without disabilities.

Given the requirement of IDEA that students with disabilities have access to the general education curriculum, these perceptions and attitudes of general education teachers underscore the challenge of this reality being fulfilled. In fact, it is apparent that subject matter teachers need to have access to instructional procedures that are both powerful and easy to use—the two criteria of effective innovations (Csikszentmihalyi, 1990). To that end, researchers at the University of Kansas Center for Research on Learning (KU-CRL) have engaged in the design and validation of instructional procedures that meet these criteria. The following sections will describe instructional procedures associated with Content Enhancement Routines (CERs), provide an integrated example of how these CERs can be applied in teaching a unit on the American Civil War, and discuss research.

**Content Enhancement Routines**

To respond to the challenges just described, a line of intervention research on Content Enhancement Routines (CERs) has been conducted for more than 2 decades at the KU-CRL (e.g., Bulgren & Lenz, 1996; Bulgren & Schumaker, 2006; Lenz & Deshler, 2004). The goal of research on individual CERs has been to help all students, including those with LD, succeed within the context of the inclusive content class. CERs are based on instructional principles designed to (a) teach academically diverse groups in ways that meet both group and individual needs; (b) carry out instruction in active partnership with students; (c) focus on the teacher as content expert and mediator of learning who selects critical features of the content and transforms them in a manner that promotes learning; and (d) maintain the integrity of the content (Bulgren & Lenz, 1996; Lenz, Bulgren, & Hudson, 1990; Schumaker et al., 2002).

A series of CERs has been designed to provide teachers with flexibility as they plan, teach, and assess critical content. CERs and their attendant graphic devices provide ways to accomplish three important instructional objectives:

1. They ensure that the adequate prior knowledge needed in the content area is already present, or they provide the scaffolding to help students acquire the critical facts, concepts, vocabulary, principles, procedures, and propositions that represent foundational knowledge.
2. They facilitate the transformation or manipulation of two or more pieces of information through categorizing, comparing and contrasting, exploring causation, inquiring into critical questions, evaluating options and claims, or making decisions.
3. They provide mechanisms for knowledge generalization, which involves predicting, inferring, problem solving, or synthesizing information into a main idea that can be used in a variety of situations.

A common instructional routine used with all CERs emphasizes active student engagement, construction of knowledge, use of graphics, note taking, student interaction, and strategic cognitive and metacognitive approaches to learning. CERs begin with planning that supports instruction so that all students can participate in learning and succeed on assessments.

This planning is a way to select CERs based on student needs and content demands. CERs contain components shown to have the potential of contributing to the success of students with disabilities in inclusive classes. These components include the use of graphic organizers (Horton, Lovitt, & Bergerud, 1990); compensation for heavy textbook reading loads, inserted questions, and checks on and support for student engagement and understanding (Gersten et al., 2006); authentic tasks, questions, cognitive strategies, and the opportunity for cooperative groups (Ferretti, MacArthur, & Okolo, 2001); classroom dialogue (Applebee, Langer, Nystrand, & Gamoran, 2003); advance organizers and procedural facilitators (Wong, Harris, Graham, & Butler, 2003); note-taking scaffolds (Boyle, 2001); and cognitive and metacognitive supports (Pressley et al., 1992; Vaughn, Schumm, & Bos, 2000). Positive results for students begin with planning that guides teachers to use instruction that incorporates such components.

Support for this planning is found in the Slice-of-the-Course-Pie planning from the Curriculum Planning frame-
work and SMARTER planning steps (Lenz, Bulgren, Kissam, & Taymans, 2004). These tools were developed to respond to the difficulties experienced by teachers as they plan for instruction in inclusive content classes. The conditions of high school teaching and the types of preservice and inservice professional development currently offered to teachers do little to help teachers deal with the types of thinking and curriculum redesign required to offer a more conceptually based curriculum. A more specific framework is required.

The Curriculum Pie planning framework addresses these issues (Lenz et al., 2004). The metaphor on which this framework was developed is one in which a course represents the "whole pie," and each unit represents a "slice of the pie." This framework is aligned with planning frameworks and guidelines proposed by others, such as Schum, Vaughn, and Leavell (1994), who have proposed the Planning Pyramid as a helpful way to differentiate between what all, most, and some students should know; by Wiggins and McTighe (1998), who developed a model for backward design; and by Kame'enui and Carnine (1998), who described teaching through "big ideas."

In Figure 1, the curriculum content in a unit, represented by a "slice of the pie," is divided into three vertical levels. As shown on the right side of Figure 1, the top of the slice represents the critical content that all students should be expected to know and demonstrate. At the very center of this area is a star indicating that the content all students must know should be selected based on a critical idea or concept—similar to Wiggins and McTighe (1998) "enduring understanding"—that rests at the heart of the discipline. This level has the potential for making the highest impact on society; the work of students that meets the stated mastery criteria at this level would be evaluated as the average or expected level of performance in a high school curriculum.

At the middle level of this pie slice, the amount of information increases, but the information here is still somewhat limited, because it is important that most students acquire this information. Socially, this level of knowledge represents a more moderate investment; the work of students that meets these criteria represents an above-average—or greater than expected—level of performance in a high school curriculum.

The lowest vertical level of the slice represents what some students should know and demonstrate about the critical idea or concept. The percentage of information at this level is the greatest and, to a large degree, is highly personalized. This level of the slice does not represent information that is unimportant or trivial. Rather, it represents information that is important for certain students, at certain times, under certain conditions (e.g., making a report, launching an investigation on an issue of interest, exploring an important author, or helping solve a local issue). Furthermore, whereas the information may be interesting, this level of content knowledge represents the least social investment. However, information at this level may have very high individual impact in terms of developing interests or choosing a career. The work of students that meets the stated mastery criteria for the critical ideas and content at all three levels would represent performance well above average or at the highest level of performance in a high school curriculum.

In addition to the vertical levels, the inner, triangular portions of the pie slice provide further supports for teachers as they plan for teaching and assessment. As explained on the left side of Figure 1, the innermost core (shown in white) represents the foundational facts, vocabulary, concepts, principles, procedures, and propositions needed in the content area. At the middle layer of the triangle (shown in dark gray) are the manipulations that need to be performed, such as comparing concepts or exploring causations. At the outer triangle (shown in light gray) are the problem-solving and generalization tasks.

Next, SMARTER planning is used as a way of incorporating into instruction the insights gained from thinking about content demands in light of each "slice of the pie." This planning is car-
ried out in seven steps. The first step in SMARTER is to Shape the Critical Questions. In this step, the teacher reflects on what is really critical for all students to understand about a course, unit, or lesson; what all students need to remember and be able to use and discuss in the long term; and how to cast these outcomes as critical questions that capture the essence of learning (see the Unit Organizer in Figure 2). Next, the Expanded Unit Organizer (see Figure 3) shows how a question from the Unit Organizer is explored in more detail, and the Question Exploration Guide (see Figure 4) shows how questions from the Unit Organizer become the focal point for in-depth inquiry, exploration, and explanation.

Keeping the critical questions in mind, the second step is to Map the Critical Content. The content map is a graphic representation of how the content might be organized. The teacher thinks about how the map might be constructed relative to describing and organizing the content to help students understand the information and answer critical questions, as shown in Figures 2 and 3.

Once the critical content has been structured in the form of a map, the content information associated with each section of the map is reviewed in the third step of SMARTER, Analyze Difficulties. The purpose of this step is to identify information that might be difficult for students to learn based on a teacher’s knowledge of (a) the field of study and its complexities; (b) previous experiences in teaching the information; and (c) the characteristics of the students in the class. The potential areas of difficulty presented by the information might be based on abstractness, organization, relevance, background knowledge, complexity, density, quantity, or relationships to other information.

The fourth step of the SMARTER planning process is to Reach Enhancement Decisions. In this step, the teacher moves from thinking about the content to making decisions about how the unit will be taught. Materials and ac-
tivities are selected and organized. Decisions are made regarding how the difficulties associated with learning the critical content should be addressed (e.g., selection of supports for ways to inquire deeply into a critical question or solve a problem, see Figure 4; understanding a single important concept, see Figures 5 and 6; comparing and contrasting concepts, see Figure 7; determining causes and effects, see Figure 8).

The teacher must also plan how learning can be achieved through the development of a learning partnership among the teacher and students, with all partners bringing something to the learning situation. The teacher brings knowledge of the content, how the content might be used, and how to relate the content to the learning situation; the student brings a context of prior knowledge and beliefs about the value of the knowledge.

The next step in the SMARTER planning process is to Teach Strategically. Strategic teaching involves (a) explaining, showing, and modeling for students how information will be taught and learned on an ongoing basis; (b) working with students in partnerships to arrive at learning outcomes; and (c) communicating the value of learning how to learn to students through the use of ongoing evaluation and feedback (including grades) about how they are learning and working with each other. This is accomplished by a common instructional sequence that involves cueing the students about the routine and its importance, co-constructing the graphic guided by the embedded strategic steps, and reviewing the content and process of learning.

The Evaluate the Enhancements step of SMARTER is a self-reflection step in which teachers evaluate the enhancements used to plan and teach the critical content targeted in the first steps of SMARTER. In short, the target of the evaluation in this step is the teacher and not the student. Evaluation should focus on reviewing the outcomes of planning, teaching, and assessing as feedback for the teacher regarding future planning decisions.

The final step of the SMARTER planning process is to Revisit Outcomes at the end of instruction. If an identified learning outcome is critical, then that standard should not be compromised; if students have not learned the critical information, additional instruction should be provided. Abandoning these standards compromises the integrity of the curriculum.

### Examples of Integrated Content Enhancement Routines in History

To demonstrate how CERs and their associated graphic devices can be used to engage students in academically diverse classes in higher order thinking, a set of integrated examples from a unit on the Civil War is presented. Explanatory notations have been added to each of the figures in shaded ovals in Figures 2 through 8 as examples of these supports. Many of the components noted may, of course, appear on several or all of the devices (e.g., exploration of prior knowledge, summarization of learning).

These figures illustrate how content-area teachers can deliver domain-specific content knowledge, support various levels of higher order thinking associated with expanded literacy requirements, and provide strategic cognitive and metacognitive supports for learning that can also be used within and across content areas and grades. It is assumed that in addition to the use of these routines and devices, critical domain-specific skills must also be taught in those classes, including the exploration of historical documents, family histories, or historical narratives. However, students may well benefit from general strategic approaches to higher order thinking in content-area courses (Alexander & Judy, 1988; Klahr, Chen, & Toth, 2001; Kuhn, 1991; Perkins & Salomon, 1989; Stevens, Wineburg, Herrenkohl, & Bell, 2005).

These CER examples represent the results of planning for instruction and assessment with the Curriculum Pie framework and SMARTER steps. It
must be noted that although the teacher fills out a graphic device prior to class as he or she plans, the teacher and all students begin with the appropriate blank graphic device and construct the meaning together in class through dialogue; sharing of experiences, perceptions, and beliefs; and participation in the development of graphic devices such as those shown in the following examples.

**Unit Organizer Routine**

At the outset of a unit on the Civil War, a Unit Organizer (Lenz, Alley, & Schumaker, 1987; Lenz, Bulgren, Schumaker, Deshler, & Boudah, 1994) would typically be developed (see Figure 2). This planning and instructional tool helps students to see the overall structure of the unit. It guides the development of the other CERs to help students explore critical questions or relationships among chunks of information within the unit. Note how the map or web in Figure 2 shows the organization of information and how the Unit Relationships box (lower right-hand corner) cues the students as to how knowledge structures and higher order thinking will be used in the unit. Figure 2 also includes essential critical questions that all students would be expected to answer at the end of the unit.

**Expanded Unit Organizer**

After an overview of the unit is provided with the Unit Organizer and the critical questions have been identified (see Figure 2), teachers may use the Expanded Unit Organizer (see Figure 3) to help students understand how the details discussed in class or covered in readings are positioned in the larger context of the unit. Thus, Figure 3 provides important facts about events and leaders of the Civil War. Also highlighted is a critical question related to the specific details covered at that point in the unit. Introducing critical questions as new details are presented helps to keep students actively engaged in the learning process. Note how the question requires students to think even more deeply about the issue of sectionalism written on the Unit Organizer in Figure 2. Another important instructional design feature illustrated in Figures 2 and 3 is each line label that connects the subject in the oval (e.g., sectionalism) to the explanatory details. The line labels highlight meaningful connections that provide students with the necessary syntax and language to integrate chunks of information. Ideally, these connections result in a sentence with a subject, verb, and object (e.g., "Sectionalism was influenced by leaders of change").

**Question Exploration Routine**

At this point, teachers begin to develop Question Exploration Guides to be used with the Question Exploration Routine (Bulgren, Lenz, Deshler, & Schumaker, 2001) for each of the questions on the Unit Organizer. These questions may be explored and the graphics developed incrementally throughout the course, or they may serve as culminating activities for summarizing what students have learned by the end of the unit (see Figure 4). The Question Exploration Guide (QEG) is used to help students systematically "unpack" a critical question, such as one of those that appeared on the Unit Organizer. To explore the question "How did differences in the geographic sections of the United States in 1860 contribute to the start of the Civil War?" the QEG helps define key vocabulary terms and support the unpacking of the critical question with question generation and explanation that results in smaller, more manageable questions (e.g., "What were the geographic differences of the sections?"") and their answers. Moreover, the QEG illustrates the ongoing use of summarization of a main idea as a key mechanism to enhance comprehension. Finally, the QEG engages students in the application and generalization of that main idea as a central part of a culminating activity. Students may be engaged in these processes incrementally throughout the unit, or the class may develop the QEG near the end of the unit. Much depends on the other CERs needed to

![Figure 5](image-url)
provide students with the foundational information required, as shown in the following sections.

**Concept Mastery Routine**

During the planning process, teachers should identify concepts that are central for students to know well to have a solid understanding of the unit. Those concepts that are both important and potentially difficult to learn (e.g., abstract, dense) should be enhanced with a Concept Mastery Routine (Bulgren, Deshler, & Schumaker, 1993; Bulgren, Schumaker, & Deshler, 1988) and its associated graphic device, the Concept Diagram. One of the concepts that a teacher may decide students need to know in depth is the concept of a “civil war.” Figure 5 illustrates one way that a Concept Diagram might be developed and used interactively by the teacher and the students during class. The teacher can confirm vocabulary knowledge and accuracy of students’ prior beliefs about civil wars with the exploration of prior knowledge elicited on the Key Words list. Higher order hierarchical categorization is introduced and mediated by the teacher to help students understand that the concept of “civil war” belongs to a larger concept class of “armed conflict.” This thinking pattern of clustering and categorization is one of the repeated uses of higher order thinking in CERs to develop understanding of concepts and relationships. Teachers can use the Concept Diagram to help students in the analysis of characteristics that describe the concept being studied. In the process, students have an opportunity to analyze descriptive information about the concept to determine which characteristics are always present, which are only sometimes present, and which can never be present in an example of the concept class. Finally, generalization of students’ understanding of a civil war is guided by the teacher as students are prompted to determine which events, including current, real-world events, are examples or non-examples of civil wars. This last design feature engages students in application, discrimination, and evaluation of learning.

**Concept Anchoring Routine**

A concept that is central to understanding the American Civil War is “federalism.” To help students gain a solid understanding of this concept, a teacher may choose to develop an analogy and use an Anchoring Table and its associated Concept Anchoring Routine (Bulgren, Deshler, Schumaker, & Lenz, 2000; Bulgren, Schumaker, & Deshler, 1994). The power of this teaching device is that it ties learning about the new concept (federalism) to a situation about which students have a good understanding (see Figure 6). Note that the exploration of students’ prior knowledge is again incorporated into this device, as it was in the Concept Diagram. However, in this case, the prior knowledge involves using a concept that is well known to students (i.e., decision making in their school) to ensure that the teacher can mediate the construction of an analogy to federalism in the United States. Again, the analysis of characteristics to create an analogy facilitates understanding (e.g., two groups are involved, rules tell how power is divided). A final instructional step in using this CER is a synthesis of information that results in an explanation of students’ understanding. This is displayed in the box at the bottom of the figure titled “Understanding of the New Concept.” To state a well-organized and synthesized statement at the conclusion of the lesson necessitates a solid grasp of the critical details and their relationship to each other.

**Comparison Routine**

If the critical information to be taught requires students to compare or contrast important information, teachers may use a Comparison Table and the Concept Comparison Routine (Bulgren, Lenz, Deshler, & Schumaker, 1995; Bulgren, Lenz, Schumaker, Deshler, & Marquis, 2002). In the example provided in Figure 7, facts are explored about the economic conditions of the North and South. Then, the identified economic characteristics are analyzed to determine those that are alike and
those that are different. The Comparison Table illustrates how strategic approaches to thinking can be prompted through the use of CERs. Here, a strategic thinking prompt that helps students approach the task and process the information is cued by the acronym COMPARING; similar prompts and acronyms are found on other devices shown. Furthermore, students are challenged to engage in higher levels of thinking associated with categorization. This is accomplished by having students identify categories into which the Like Characteristics and Unlike Characteristics fit. For example, the Unlike Characteristic of “immigrants in the labor force” (for the North) and “slaves in the labor force” (for the South) can be categorized into an overarching category of “primary sources of labor.” Teaching students how to process information by using categorization provides them with the succinct language that can be used to recall, talk about, and use the information being compared. The importance of categorical language is highlighted in the summary statement, where this kind of language (rather than language of specific details) is used for synthesis and integration of the essential information being compared.

Cause–Effect Routine

A Cause–Effect Table is used to learn about the causes of the American Civil War (Bulgen, Deshler, & Schumaker, 1998). One way of exploring causation involves identifying a sequence of events. As shown in Figure 8, a situation beginning with the Constitution in 1776 is finally played out as a crisis from 1861 to 1865. This device also highlights the key vocabulary words that are foundational to understanding and applying the content in this unit, for example, secede, civil, and federal. A thorough explanation of causes of the American Civil War, including social, economic, and political causes, is explored, resulting in an explanation of effects. By configuring the information in an easy-to-follow graphic, students can understand how information is arranged and processed to determine sequential cause-effect relationships. Finally, summarization reinforces the critical content learning.

When teachers use CERs in an integrated fashion, as illustrated with this history unit, students’ mastery of critical content is enhanced, as is their awareness of how to think about and process information. In the development of these graphic devices to mediate understanding of a unit on the Civil War, the planning supports in the Curriculum Pie framework and the SMARTER steps are continuously and cyclically applied to ensure the selection of appropriate scaffolds to mediate student learning.

Research Paradigm

Research over the past 2 decades has provided support for the potential of individual CERs to help students learn. Collectively, the attributes associated with this line of research enable us to study the degree to which the targeted CER is effective in changing how students process information and perform on academic tasks. To illustrate this research paradigm, an investigation of a Cause–Effect Routine will be briefly summarized (Bulgen, Deshler, & Schumaker, 1998; see Figure 8 for the associated graphic device).

Attribute 1: Fidelity and Ease of Use

Data are collected on the ease with which teachers can learn to use the routine and the fidelity with which they implement the routine. In this case, teachers learned the routine quickly and implemented it at mastery levels.

Attribute 2: Effects on Subgroups of Students

One of the most challenging aspects of inclusive teaching is to design instruc-
tional procedures that are responsive to the major subgroups of students typically included in academically diverse classes. In order for classroom teachers to embrace a CER, they must be convinced that it is effective for students in each of these subgroups. In the case of the investigation of the Cause–Effect Routine, 166 seventh-grade students participated in the study on this routine, and for students in each subgroup (HA, AA, LA, and LD), the results were disaggregated and analyzed according to this subgrouping as well as for the total group.

Attribute 3: Validation Studies to Determine Effects on Student Performance

Research on the routines presented here included validation studies of various types. In some cases, experimentally controlled studies were conducted in which a researcher delivered instruction in a setting other than the students' usual classrooms to students randomly assigned to either experimental or control conditions or, in some cases, to randomly assigned intact classes. Furthermore, validation studies are often conducted in which inclusive content-area teachers are randomly assigned to either experimental or control conditions; they then teach regularly scheduled content to all their students in intact classes using either the targeted routine or regular instruction, and they give common assessments.

In this study, after each of the six general education teachers had used the routine to teach regularly scheduled content at least three times, their students were asked to read an article about environmental problems associated with the use of pesticides and write an essay explaining a sequence of events, identifying causes, and explaining effects associated with the use of pesticides in the modern world. Students in the experimental group significantly outscored students in the control group on a measure designed to assess their ability to explore and explain causes and effects.

Attribute 4: Measurement of Components Associated with CERs

To determine the impact of a CER on the academic performance of students, measures are often taken on other instructional components. As permitted by time and experimental design, these measures have included assessment of the quality and quantity of students' notes, assessment of students' knowledge of the embedded steps of the strategic approach, students' ability to generalize the strategic approach to a different content area than the one in which students received instruction, and correlational studies.

For example, in this study (Bulgren et al., 1998), analyses were conducted to determine differences in notes taken by students in the experimental and control groups. Differences were found between experimental and control conditions in favor of the experimental group on quality and quantity of note taking. Then, analyses were conducted to determine students' knowledge of embedded steps in the strategic approach used in the routine and shown on the graphic device. Analyses indicated significant differences in favor of the experimental group relative to knowledge of the strategic approach. In addition, significant correlations were found in favor of the experimental group between knowledge of strategy steps and performance on the task designed to assess ability to explore and explain causes and effects.

Attribute 5: Teacher and Student Satisfaction with the CER

Although improving student outcomes is the first priority of any instructional endeavor, it is recognized that the instructional practice must be one that is palatable for classroom teachers to use and incorporate into their ongoing instructional routine. Similarly, it is important that students in an academically diverse class find that the new CER enhances their learning and performance. Therefore, satisfaction, mo-
tivation, and confidence surveys may be administered. In this study, teachers were satisfied with the feasibility and value of using the routine, and they indicated that they expected to continue using the procedure. Students in the experimental condition were more confident than students in the control condition in the correctness of their strategic approaches and the correctness of their answers.

Conclusion

Educators are faced with the challenging goal of substantially improving the educational outcomes of all adolescents in academically diverse subject matter classes that include students with LD and students at risk for school failure as well as average- and high-achieving students. This article addresses some of the issues involved in successfully including students with LD in rigorous courses, such as those in history, at the secondary level. Analyses of curricular demands and standards clearly indicated that students are expected to successfully learn facts and concepts and engage in higher order thinking to meet existing expectations. In spite of these expectations, secondary teachers have reported concerns that students with LD may not be able to successfully master the critical subject matter contained in large volumes of content information that must be taught in relatively short periods of time. Therefore, one of the paramount challenges in inclusive classes is teaching critical elements of the curriculum content to all students, including struggling learners who may lack the strategic approaches they need to learn the content material.

For more than 2 decades, researchers at the University of Kansas Center for Research on Learning have investigated the viability of Content Enhancement Routines (CERs) as instructional tools to support planning, teaching, and assessing that can be used in rigorous subject matter courses containing academically diverse students. CERs have been designed to teach content information in the form of facts and concepts as well as the manipulation of content information and generalization of learning to all students, including those who may lack proficiency in critical skills and strategic approaches to learning. This research has repeatedly shown that students in academic classes can master critical content elements and improve their outcome performance when teachers systematically incorporate CERs in their classes and teach them explicitly to their students. However, teachers may need support in the development and implementation of integrated sets of CERs, and more research is needed to determine the power of such integrated sets of routines not only within a specific content area, such as American history, but also across content areas and grade levels within schools.

ABOUT THE AUTHORS

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AUTHORS’ NOTE

For more information on Content Enhancement Routines and associated professional development sessions, contact the director of professional development at the KU Center for Research on Learning (tel. 785/864-4780; e-mail: crl@ku.edu)

NOTE

Achieve, Inc., was created by the nation’s governors and business leaders in 1996. It is a bipartisan, nonprofit organization that helps states raise academic standards, improve assessments, and strengthen accountability to prepare students for postsecondary education and work.

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Nancy S. Bley and Carol A. Thornton

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