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Adolescents with Learning Disabilities, Part I: Goals of the Knowledge Dimension

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Abstract

Six basic principles associated with making knowledge construction more meaningful and robust are examined, and examples of specific instructional techniques particularly appropriate for use in inclusive classroom settings are provided. These techniques focus on teaching big ideas, promoting elaboration, relating to real-world contexts, and integrating thinking skills and strategies into the curriculum.

Although a host of very effective techniques for promoting independence and self-reliance have been developed during the past two decades, much of the actual practice in special education for adolescents with mild disabilities does not emphasize these procedures. Instead, practice is largely *accommodations* oriented, and this is particularly true with the growing emphasis on the implementation of inclusion in secondary classes.

Accommodations come in three basic forms.

First, the manner in which students are assessed and graded is often adjusted to accommodate what are believed to be an individual student's unique disabilities (Thurlow, Ysseldyke, & Silverstein, 1995). Examples include the following:

- Reading a test to a student with significant reading disabilities;
- Allowing extra time to take tests for students who process information slowly;
- Allowing students with writing disabilities to dictate answers to tests in lieu of having them write responses; and
- Basing grades on effort as opposed to actual progress or demonstrated learning.

Second, the nature of the curriculum is often modified in two basic ways: (a) It is significantly reduced so that students with learning disabilities (LD) are not expected to learn as much of the same material, or (b) the content is significantly simplified. Examples of content accommodations for students with mild cognitive disabilities include the following:

- Expecting the student to learn fewer vocabulary terms per week than their normally achieving peers;
- Providing easy-to-read texts adapted for reading difficulty; and
- Providing special content-area classes (e.g., social studies, science, language arts) that are modified so that content is briefer and simpler.

Third, accommodations are often made in terms of the nature of tasks students are assigned; alternative tasks are often identified that reduce the information processing demands on students and/or allow them to circumvent weaknesses they may experience. Examples of these include the following:

- Providing outlines of information presented in a text chapter depicting main ideas and pertinent points; and
- Assigning group projects (as opposed to individual projects) so that the more capable students in the group complete those tasks within the project that require skills the student with disabilities lacks (e.g., having someone else in the group complete the writing aspects of a project so that the less capable writers will not have to write).

Many practices associated with providing students with accommodations *water down the curriculum and expectations* of students with mild cognitive disabilities. The watering-down approach reflects an apparent belief that the role of special education is to enable students to acquire the necessary course credits that lead to graduation and to enable them to understand and remember the minimal amount of content-area information necessary to attain course credits. Such accommodations may initially seem like logical practice, but they are inherently limited in many ways.

Limitations of watered-down curricula

Emphasis on memorizing loosely related facts

Watering down the content to make it less complex sometimes results in a

disjointed curriculum that is composed largely of memorizing various relatively insignificant concepts and facts (Passe & Beattie, 1994). This type of curriculum does not allow students to form schemas that reflect understandings of the interrelationships among different concepts and facts. Just as basic skills are sometimes taught as isolated, decontextualized parts, so watered-down content tends to be taught as a series of little unrelated packages.

Moreover, because the concepts and facts are not related in a meaningful way, instruction is not interesting, and students are less likely to receive opportunities for self-directed learning (e.g., conduct their own research, make class presentations and projects; Prawat, 1989). Students are also less likely to participate in instructional activities that involve peer collaboration (e.g., cooperative learning), and teachers are less likely to offer in-class activities such as science experiments and out-of-class activities such as field trips. In part, the watered-down approach may have resulted because special education teachers lack training in both secondary teaching strategies and content-area subject matter.

Reduced opportunities for learning content

Watering down the curriculum may contribute to greater failure experiences in the long term because the practice restricts students' opportunities to learn. Reducing curriculum content limits the amount or kind of information that can be acquired even before learning can begin, regardless of the quality of teaching (for a review of related issues, see Tindal, Rebar, Nolet, & McCollum, *1995).*

Fewer opportunities to develop thinking skills

Frequently concomitant with the practice of watering down the content is the practice of restricting opportunities for students with cognitive disabilities to develop thinking skills. Too often, it is assumed that (a) mastery of basic skills is a prerequisite to acquisition of higher order thinking skills; (b) remediation of basic skills should have a higher priority than instruction in thinking skills (Schlichter & Brown, *1985);* and (c) students with mild disabilities are unable to develop cognitive skills.

Although it might seem reasonable to assume that students who have not developed basic literacy skills are not ready to engage in higher order thinking and information processing skills, little or no empirical evidence supports this belief (Pressley, Johnson, & Symons, *1987).* The ability to read and write is not a prerequisite to developing these abilities.

In an effort to foster growth in thinking and information processing skills, teachers may sometimes assign tasks that require the use of basic literacy skills. Students lacking basic literacy skills may subsequently experience a great deal of difficulty completing the task, and it then becomes easy to misinterpret causes of failure. Teachers may assume that the students were not ready to engage in the task because it required use of thinking skills they did not possess. Although this may be true in some circumstances, it is also very possible that students could readily handle the thinking element of the task, but failed at the task due to a lack of the literacy skills required. Thus, teachers need to be selective about the nature of tasks assigned to students who lack basic literacy skills.

Inhibited "learnability" of subject matter

Surprisingly, educators' efforts to make content less complex and easier to understand can often have the reverse effect. For example, "easy-to-read" adapted texts are often used because they have low readability scores, featuring shorter sentences, monosyllabic words, and the like. These modifications can be counter-productive because ideas tend to be presented in short, choppy, list-like bits of information. The elements that indicate important relationships between ideas tend to be eliminated (Anderson, Armbruster, & Kantor, *1980;* Bean, Zigmond, & Hartman, 1994; Chambliss, *1994).* Adapted texts also typically have more illustrations; however, these sometimes make text more difficult for some naive readers because the visuals often have little relation to the text (Harber, *1983).* Lenz, Alley, Beals, Schumaker, and Deshler *(1981)* found that students with LD often experience more difficulty comprehending the watered-down textbooks than they do traditional textbooks written for normally achieving students.

Reduced investment in learning

Because the watered-down curriculum is often inherently less interesting to students, teachers sometimes have to resort to extrinsic reward systems such as behavior modification (e.g., Patzelt, *1991)* to entice students to engage in academic tasks. In such cases, the teacher tends to focus on ensuring that students comply with the norms of schooling, and students' grades are often based on how well they comply with these norms rather than how well they actually understand the content being taught.

The net result is that students with LD view the secondary school experience as meaningless-or, as students sometimes put it, they "play the 'school' game," doing the minimum to get by. Clearly, numerous interrelated factors contribute to the nearly 50% dropout rate of students with mild cognitive disabilities (Lovitt, *1991);* however, the watered-down curriculum likely plays a significant role in this unfortunate statistic (Sitlington & Frank, *1993).*

Watering up the curriculum

Several compelling factors suggest that the emphasis should be on *watering up* the curriculum for adolescents with mild cognitive disabilities. For example, a common practice in gifted education is to water up the curriculum through enrichment. Here, the goal is for students to grapple with core content ideas and to develop sophisticated relational understandings of these ideas. Students often engage in a variety of analytical, critical, creative, and productive thinking and problem-solving activities to further develop cognitive skills. Moreover, in lieu of stressing memorization of facts, the emphasis is often on developing information processing skills (e.g., finding and making sense of information, recognizing core ideas, discriminating essential from non-essential details, recognizing the structure of information, using information to solve problems, and effectively communicating information to others). In addition, instruction in effective and efficient learning strategies is often integrated into the ongoing content (e.g., social studies, literature, etc.) instruction. Arguably, all students (not just those with special gifts and talents) need to develop these kinds of cognitive skills and thus should receive a watered-up curriculum.

This article explores how a watered-up curriculum can facilitate achievement of the goals of meaningful learning and development of deep knowledge structures to create "thought-full" classrooms for students with learning disabilities (see Figure 1). Following a brief explanation of each goal is an example of an instructional routine or device that can be used in pursuit of that goal. A companion article (to appear in an upcoming issue of RASE) addresses the affective goals associated with the watered-up curriculum. The reader should keep in mind that the goals of the watered-up curriculum are not absolutes, or objectives that can be attained "perfectly"; rather, the goals provide the teachers with a rubric or framework within which the process of moving toward the goals is central.

Goal 1: students construct knowledge

Many traditional approaches to teaching content-area subjects do not account for what is understood about the construction of knowledge, the learning process, and critical cognitive actions that must take place for meaningful learning to occur (Jones, Palincsar, Ogle, & Carr, *1987).* To construct knowledge (as opposed to memorizing someone else's understanding of it), learners must understand the information in relation to what they already know and to their own experiences (for a review, see Bryson, *1993;* Reid, Kurkjian, & Carruthers, *1994;* Wansart, *1995).* With the exception of specific facts, knowledge of information is relative and never static. One's understanding is constantly changed as information is viewed from different contexts and in relation to other background knowledge or new information. Though knowledge of facts may be right or wrong, recalled or forgotten, *understanding* of facts (e.g., how they relate to a specific subject) is also continually changing, and thus is also relative and never static.

In a watered-up classroom, the role of the teacher is to facilitate students' constructing (and reconstructing) of understandings so that their thinking becomes increasingly clear.

Goals of a Watered-up Curriculum

Knowledge Dimension

More emphasis on students' constructing knowledge

More depth, less superficial coverage.

More emphasis on archetype concepts, patterns, and strategies.

More emphasis on developing relational understanding and knowledge connections to real-world contexts.

More student elaboration.

More emphasis on developing effective habits of the mind, higher order thinking and information processing skills, and learning strategies.

FIGURE 1. Goals of a watered-up curriculum. *(Note.* Copyright 1997 by Edwin S. Ellis. Reprinted with permission.)

Example: rainbow sticky-note semantic mapping.

The "Rainbow Sticky-Note Semantic Mapping" procedure (adapted from Bos, 1995; Parks, 1995) incorporates a number of subtle techniques that serve to facilitate student construction of knowledge. Semantic mapping (also called semantic webbing) can be a powerful technique for students with mild cognitive disabilities (Anders & Bos, 1984). This routine facilitates activation of background knowledge, anticipation of upcoming learning, student self-evaluation of existing knowledge about the topic, meaningful structuring of both existing and new knowledge, and understanding of interconnections and relationships among various important concepts and facts. The procedure can be used before, during, and at the end of the lesson.

At the beginning of the lesson, the teacher identifies a key word, writes it on a sticky-note, and places it on the board. For example, in anticipation of teaching a lesson about John F. Kennedy (JFK), the teacher might write "John F. Kennedy" on the sticky-note. Students work in groups to brainstorm a list of related words or related ideas that reflects what they already know about the topic and write each idea on a separate sticky-note. Once the lists have been generated by each group (about 3 minutes), students evaluate their relative confidence about their knowledge of each item in the list using a code that is noted on each sticky-note (e.g., !! = very *confident that this is accurate and an important idea that is directly related*

to the key idea; ! = somewhat confident, but not absolutely positive; ? = not sure-maybe this is important, maybe not; ?? = wild guess).

Figure 2 lists background knowledge facts about JFK that were generated by a class. Each item has been coded by students to indicate their relative confidence in the accuracy or importance of the information. Because this information came from students' background knowledge, some items may reflect erroneous understanding or incorrect information (e.g., the idea that JFK's father was a booze smuggler). These misunderstandings are addressed later in the instructional procedure.

Figure 2. Sample list of background knowledge about JFK.

Background knowledge	Confidence Code
youngest president	!
very popular	!!
assassinated in Dallas	!!
"Jackie" was wife	!!
Space race. . . "man on moon in 10 years"	!
MLK - 'I have a dream' speech	?
Rosa Parks - bus seat	?
riots, marches, police beatings, KKK	!
nukes - "Cold War" with USSR	!
son John John	!!
senator before	??
Catholic	??
father - booze smuggler	?
started Peace Corps	?
"Ask not what country can do for you . . ."	!!
For equality of races	!
Bobby was brother	!
back problems	?
girlfriends in White House	?

Next, the teacher collects all of the coded sticky-notes and places them all on the board in column form. Students are asked individually to select one of the ideas from the column of sticky-notes, explain it to the class, and suggest where it might be placed on the board relative to the original central idea. As each sticky note is moved from the column and rearranged relative to other sticky notes and the central idea, a web of ideas showing an organization of the background knowledge of the class gradually emerges. As the web grows, new "arms" representing new categories and subcategories are added (but the teacher should not name these arms). To ensure participation of less able students, the teacher should call on them relatively early in the process; their knowledge may be more limited, and others might use their list items before they have a chance to contribute.

As ideas are encountered that repeat others already included on the web, the teacher should ask students to indicate whether the idea has already been used, or whether it is actually different from others on the web and thus should be added. Once the sticky-note web has been established, students are asked to add any additional ideas from their background knowledge. Students then name each arm of the web, thus establishing category names.

Eventually, a large hard copy of the web is constructed, showing the exact ideas and their organization as depicted on the original sticky-note web. This might be drawn on a bulletin board or large piece of butcher paper so that the entire class can observe the web at once. Figure 3 illustrates a background knowledge web based on the earlier list of facts generated by the class.

As the topic is explored and new information is identified, the teacher can periodically ask students to decide on which of the ideas about the topic should be added to the web, and in what way. For example, a new arm might be added to the web that reflects new information learned. As information is added to the web, it can be color-coded. For example, new information about JFK that was primarily about his domestic policy might be noted in blue, new information about his foreign policy might be noted in red, and so on. As the web grows over a series of lessons, and new information is color-coded, the overall effect is a "rainbow" web.

Click here to view Figure 3. Sample background knowledge web.

Note codes by each idea indicating student's confidence in accuracy of information.

Figure 4 illustrates how the original background knowledge web was expanded as new knowledge about JFK was developed during class. In this figure, a different font was used to represent how a different color might be used for each new arm of information in the actual web.

At the end of the lesson or unit, several techniques can be used to facilitate reflection, elaboration, extensions of understanding, and connections to other ideas. For example, students can:

1. revisit their original coding of each idea and change the codes to reflect their current understanding and confidence levels. For instance, based on their new knowledge of the subject, students can recode items that were originally coded as guesses as "high confidence." They can also revisit information previously listed that should be removed because they now know it is erroneous (e.g., the idea that JFK's father was a booze smuggler would be deleted from the web);
2. generate "I'm wondering about questions for some of the items listed on the web and use these as a springboard for inquiry and research"; and

3. select a color and then explain how all of the items listed in that color are related to one another (or to items of another color).

In short, the Rainbow sticky-note semantic mapping technique is an example of instructional techniques that enable students to construct knowledge, and at the same time ensure accuracy and promote elaboration of the information learned.

Click here to view Figure 4. Background and new info

Goal 2: more depth, less superficial coverage

Teachers striving to provide a watered-up curriculum are more concerned with facilitating in-depth understanding and developing deep knowledge structures of essential concepts or "core ideas" than they are with content coverage (e.g., addressing all the topics in the book). This means that teachers providing a watered-up curriculum strive to focus both their own and students' energies on understanding core ideas of the curriculum, how they interrelate, and how these core ideas help us understand the current world and solve real-world problems (Cushman, 1994; Newman & Wehlage, 1993).

Because formal guides such as state-mandated curriculum guides, course-of-study guides, and textbooks tend to be so packed with the details of content, it can become very easy to lose track of how various details relate to understanding the current world and to believe that content coverage is the ultimate goal. Too often, this approach to teaching results in two unfortunate phenomena: the "spray-and-pray" approach to teaching and the "intellectual bulimia" approach to learning. In the spray-and-pray approach to teaching, teachers spray students with a thin amount of content that covers a wide array of information (analogous to spray painting a car with a very thin layer of paint), and then pray that some of the information will stick. In other words, the content-coverage approach too often results in teaching very little about a whole lot. Students gain only rudimentary, surface levels of knowledge instead of developing deep knowledge structures about core ideas. In the intellectual bulimia approach to learning, students focus on school compliance-doing whatever is necessary to get a socially acceptable grade. Students "gorge themselves" the night before a test, memorizing facts and figures on a rote level, and then "regurgitate them for the test the next day." To further compound the problem, many students believe that they must intentionally forget what they have just learned for the test in order to make room in their brains for the next round of memorization. In a watered-up classroom, methods that facilitate relational understandings of core ideas supplant the spray-and-pray approach to teaching and the intellectual bulimia approach to learning.

More depth and less superficial coverage means that facilitating sophisticated understanding of core ideas is the primary goal of instruction. Core ideas are analogous to main ideas, but are more generative in nature; instruction emphasizes ensuring that students understand core ideas in relation to real-world contexts. For example, core ideas associated with the part of the Civil Rights Movement occurring during JFK's tenure might be "creating equality of and respect for humans of all races," "constitutional issues concerning establishing and protecting individuals' civil rights," "why and how racism occurs and can be prevented," "resolving moral dilemmas such as discrimination," "using peaceful resistance to effect social change," and so forth.

More depth and less superficial coverage also means that teaching facts and details is important only when they help students understand the core idea being stressed. If a detail does not help the student develop a more precise understanding of the core idea, then, with the exception of culturally expected knowledge, the detail is probably not worth teaching (for a review of related issues, see Hudson, Lingugaris -Kraft, & Miller, 1993).

Culturally expected factual knowledge is the set of facts that a society expects its citizens to know, regardless of whether the citizen has much of an understanding beyond the fact itself. For example, in the United States, there is the cultural expectation that every student should know facts such as "Martin Luther King, Jr., was the key leader during the Civil Rights Movement of the 1960s." However, knowing that King was a civil rights leader during JFK's tenure is *not* essential to understanding the core ideas associated with the Civil Rights Movement. Understanding some of the dilemmas King faced and how he resolved them clearly helps students develop a more conceptually rich understanding of the core ideas associated with the Civil Rights Movement, but this kind of meaningful information is not necessarily culturally expected factual knowledge.

Knowledge of these kinds of facts is largely dictated by cultural expectations rather than needs associated with developing conceptual knowledge. The problem occurs when teachers fail to recognize which details are essential to developing a conceptual knowledge base, which are culturally expected, and which should be ignored.

In the "less is more, depth is more" approach (Cushman, 1994), teachers carefully consider factual details before teaching them (Schumm, Vaughn, & Leavell, 1994). Categorizing details on a continuum of importance can help teachers identify essential details. *Critical details* are essential to understanding the core idea. If students do not know these details, their understanding of the core idea will be incomplete. Generally, students must know these details for future instruction to be effective, so these should be thoroughly taught and students' knowledge of them should be evaluated. *Clarifying details* can be used for helping students better understand critical details or the core idea, but students are not necessarily

expected to learn and remember this information. Clarifying details are addressed during class, but they are not tested.

Specialized and esoteric details are highly specific and relatively unimportant for understanding the core idea. Some of these details may be critical to know if a student is developing a highly specialized knowledge base, but this level of specificity is not appropriate for most students. Esoteric details might best be viewed as trivia that is relatively useless, even for developing specialized knowledge. Very bright students might be encouraged to develop more specialized knowledge, but most students would not be expected to learn this information. Teaching this level of information may actually obscure the core idea. At first glance, not teaching the more specialized details might seem like watering down the curriculum, but the selection of details to be taught must be viewed in the larger context of what is actually being learned *(and retained)*by students. What often happens when the focus is on teaching specialized details is that students fail to understand and learn the more conceptual and essential information. In other words, they memorize the details, but miss the point. Unfortunately, many teachers- particularly those who themselves lack sophisticated understanding of the content they are teaching-seem to place great value on students' knowing trivial information and thoroughly test it. Many of these teachers base their grades on the following continuum:

> Those students who can correctly identify critical details receive a C.
>
> Those students who can correctly identify critical and clarifying details receive a B.
>
> Only those students who can correctly identify critical, clarifying, and specialized/esoteric details receive an A.

Such practices suggest that success in school is based on how well students can master the secondary school version of "Trivial Pursuit." An alternative perspective on assessment emphasizes determining the sophistication of students' understanding of core ideas and how critical details or features relate to them. Grades are based on a different continuum. For example:

Those students who can describe a core idea and recognize its critical features receive a C.

Those students who can (a) describe a core idea and its critical features, (b) generate similes or metaphors, and/or (c) provide examples and non-examples of the core idea receive a B.

Those students who can (a) describe a core idea and its critical features, (b) generate similes or metaphors, (c) provide examples and non-examples, (d) relate or identify applications of the core idea to real-world contexts, and (e) make connections to other core ideas receive an A.

Example: The core planning form.

The CORE planning form can be used to plan instruction that focuses on developing a conceptual understanding of core ideas (Schumm et al., 1994; see also Joint Committee on Teacher Planning for Students with Disabilities, 1995). This planning form is designed to help teachers recognize the core ideas of a unit, identify the best way to structure or organize these ideas so that they are more easily understood by students, identify essential questions that students should be able to answer if they really understand the core idea, and identify ways in which the ideas might be related, in a meaningful context, to students' lives. Figure 5 shows how this planning form can be used to plan a unit about JFK.

Goal 3: More emphasis on archetypal concepts, patterns, and strategies

An *archetypal concept is* an idea that is universal and is manifested across genres, settings, and contexts. An example of an archetypal concept is that "all living beings have a need for self-preservation and procreation, and much of their behavior is centered around these two goals." An archetypal pattern is a relatively predictable sequence of events that also is manifested across situations and settings. An example of a simple archetypal pattern is that "for every action, there is a reaction." This pattern applies to human behavior, plant life, and even biophysics. In fact, the pattern manifests in all walks of life; thus it is archetypal. Like archetypal concepts and patterns, archetypal strategies cross most areas of human performance. An example of an archetypal strategy is "think ahead to plan, think during to monitor and adapt, and think back to reflect. "

In watered-up classrooms, the emphasis is on facilitating the discovery or identification of archetypal concepts, patterns, and strategies, and how they are manifested across genres, settings, and contexts. The more students understand an archetype and are able to recognize its manifestations in the content areas, the more readily they understand material being taught in secondary classrooms. Content-area subjects are often considerably easier to understand when the archetypal patterns, concepts, and/or strategies associated with the subject are evident to the student.

When teaching a particular lesson, the teacher can facilitate understanding of the content and of archetypal patterns in a variety of ways. One approach is to teach students what the pattern is and then create opportunities for students to see how the subjects they are studying fit the

pattern. For example, how the pattern is manifested in the subject can be literally shown to students. Or, the teacher and students can work collaboratively to identify ways in which the archetypal pattern is manifested in a specific topic. Another approach is to create opportunities for students to discover or invenarchetypalle patterns themselves. Here, the teacher acts as a guide as students construct a pattern, and then they test it on a wide variety of topics, either modifying the pattern to make it more precise or abandoning it in favor of some other pattern they think they have discovered.

Arguably, an understanding of these patterns and concepts, as well as how to use this knowledge to solve problems, is one of the most important forms of conceptual knowledge we can instill in students. Unfortunately, many teachers lack awareness of the key archetypal patterns and concepts, and thus cannot make them the core of their curriculum. Knowledge of several archetypal patterns may help teachers to recognize and use them.

The tension/reaction/spin-off tensions archetypal pattern

One way of approaching understanding how change occurs is the perspective that any change is a function of a reaction to some form of tension. A tension can be manifested as a conflict, problem, need, or issue. Tensions are not always negative. For example, a positive tension occurs when one must choose between two good movies to attend at the local theater.

Click here to view Figure 5. CORE planning form for JFK's Cuban Missile Crisis

Sample of CORE planning form for a unit on JFK's Cuban Missile Crisis. (Note. Copyright 1997 by Edwin S. Ellis. Reprinted with permission.)

A number of variables may contribute to a developing tension. Once the tension becomes sufficient in magnitude, a reaction will result. Sometimes the reaction may be initiated due to a pivotal event (analogous to "the straw that broke the camel's back"), and sometimes a pivotal event may signal the beginning of a reaction but not actually serve as the catalysis for the reaction. Once a reaction occurs, there is always some change in the status quo, or result of the reaction. Like an ever-widening spiral, these results always, in turn, create new "spin-off" tensions and subsequent reactions.

The tension/reaction archetypal pattern is manifested in all walks of life. For example, *every* event in history, psychology, economics, and politics can be analyzed and better understood when it is viewed through the lens of this archetypal pattern. In fact, any social dynamic can be viewed within this archetypal pattern; thus, using this pattern for analyzing social interactions to promote conflict resolution skills potentially can be very effective.

Understanding the tension/reaction archetypal pattern can also help students develop problem-prevention and problem-solving skills. For example, as students learn to identify a tension and become familiar with the pattern associated with what typically happens when this type of tension occurs, they can learn to anticipate or forecast reactions to it, potential changes in status quo, and potential new spin-off tensions. This level of knowledge is essential to development of effective strategies for *preventing* problems.

Example: Tension/reaction analysis form.

Figure 6 shows a Tension/Reaction Analysis form developed to facilitate understanding of the tension/reaction archetypal pattern associated with the Cuban Missile Crisis. This graphic organizer can be used in a variety of ways to promote understanding of the to-be-learned content. For example, the teacher can analyze an event and complete the form prior to class, using it during class as a basis for explaining the event. Another way to use the form is to complete it with the students. Thus, the completed graphic organizer is co-constructed by the teacher and students. During this activity, the teacher provides scaffolded instruction-just enough assistance to allow students to complete the analysis.

Once students have become familiar with the tension/ reaction archetypal pattern and how the graphic organizer can be used to analyze an event, they can work collaboratively to construct one themselves. For example, students might first gain knowledge about the event via various information sources (films, class discussion, reading, etc.) and then work collaboratively in groups to determine the tension, reaction, and spin-off tensions associated with the event.

The Tension/Reaction Analysis form addresses four learning objectives:

1. Ensuring that students develop a thorough understanding of the content.
2. Developing an understanding of the archetypal pattern: that all change results from a reaction to some form of tension, and that any change always results in the development of new tensions.
3. Developing the ability to recognize the tension, sources of tension, reactions, results, and spin-off tensions in specific situations.
4. Developing forecasting skills (i.e., given a growing tension, to forecast what reactions, results, and spin-off tensions may result if the tension becomes sufficient in magnitude to cause a reaction).

The risk-taking archetypal pattern

Risk taking is often viewed as a negative behavior to be discouraged in order to avoid catastrophe, and clearly, many students with LD have learned to avoid taking risks with their learning (e.g., minimizing class participation). Although some forms of irresponsible risk taking should obviously be avoided, risk taking is

not always undesirable. In fact, every person who has achieved something significant in his or her life took risks. Anytime students ask questions or offer comments in class, they are taking risks. Given the history of failure that most students with LD have experienced, most have learned to avoid risks associated with learning and participating in learning activities. Because risk taking is a fundamental element of success, students should be taught to take responsible risks. Likewise, because all events involving human interaction throughout history reflect risk taking, events are considerably easier to understand if risk taking is taken into account. Thus risk taking is an archetypal pattern that should be addressed regularly in watered-up classrooms.

Click here to view Figure 6. Sample Tension/Reaction Analysis form

Sample Tension/Reaction Analysis form depicting relationships associated with events leading to the Cuban Missile Crisis. (Note. Copyright 1997 by Edwin S. Ellis. Reprinted with permission.)

Anytime someone takes an action to effect change (or avoids taking action), risk taking is a key dynamic in the decision. Sometimes the risk-taking dynamic has very little apparent influence on the decision, and sometimes it is the primary consideration, but there is always risk involved to some degree, no matter how great or insignificant a decision may be.

The risk-taking dynamic involves several dimensions. Like the tension/reaction pattern, risk taking always begins with factors that contribute to a developing tension. When an individual decides to act on the tension, the risk-taking dynamic comes into play. Part of this dynamic involves peril or inhibiting factors; these variables influence the individual to either avoid making a decision or avoid taking the action being considered. Sometimes the perils/ inhibitors are consciously considered during decision making, and sometimes they influence the decision maker in more subtle ways; in some cases, their influence may be only minimal.

The risk-taking dynamic also involves "enticement" factors. *Enticers* are variables associated with the potentially desirable outcomes that may be achieved as a result of the decision; they influence an individual to take risks in spite of the perils/inhibitors involved. Like perils/ inhibitors, some enticers may be consciously considered, whereas others may be more subtly influencing the decision-making process.

The decision maker must weigh the perils/inhibitors against the enticers. A decision is a reaction to the tension, regardless of whether or not action is taken. Likewise, even the act of avoiding making a decision is, by default, a reaction to the tension. As in the tens ion/reaction archetypal pattern, anytime there is a reaction to the tension, the status quo will change in some way. Sometimes these changes are intentional and reflected by the original goals, and sometimes they are unexpected. Often, results reflect a combination of both expected and unexpected outcomes. Likewise, an individual may or may not perceive the results.

Anytime there is a change in the status quo stemming from the original decision, new tensions, issues, or conflicts will arise. A notion that is very important for learners to understand is that non-decisions are reactions; they may be passive reactions, but they will nonetheless always influence the status quo-which in turn produces new tensions.

Because literally every human event that involves a decision-making element reflects the risk-taking dynamic, analyzing this archetypal pattern is an excellent way to help students understand the role of risk taking. The advantages of using the pattern for analyzing contemporary adolescent behavior (i.e., risks associated with unsafe sex, driving while intoxicated, etc.) are readily apparent; however, the pattern is also an excellent tool for facilitating understanding of a wide array of topics, including the behavior of historical or contemporary figures (e.g., the President of the United States), groups of decision-making persons (e.g., House of Representatives), current events, and so forth. The risk-taking archetypal pattern can be used to facilitate understanding of human dynamics, sociology, and psychology. Perhaps most importantly, the archetypal pattern can be used to help students both to become better, more responsible decision makers and to become greater risk takers.

Example: Risk-taking analysis form

Figure 7 shows a completed Risk-Taking Analysis form that illustrates how the pattern can be applied to a specific historical event (JFK and the school integration crisis).

As with the Tension/Reaction Analysis graphic, the teacher can complete the Risk-Taking Analysis form prior to introducing it, and then use it as a structured way to explain an event. Later, once students are familiar with the format of the graphic, new events can be explored and analyzed via the Risk-Taking Analysis graphic; teachers and students co-construct the graphic together.

Eventually, students can work collaboratively to complete the Risk-Taking Analysis form after they have learned about an event. For example, to promote reading comprehension, a group of students can be assigned a passage to read and then be asked to work collaboratively to identify the tension, its sources, the perils/inhibitors, and so on, to complete the graphic organizer.

The graphic can also be used as an assessment tool; the student's ability to explain an event using the graphic will reveal a much greater understanding of the content (or misunderstanding of it) than traditional paper-and-pencil tests could ever indicate. A rubric can be used that reflects a range of levels of sophistication of the student's understanding.

The Risk-Taking Analysis form can also be used as a tool to develop

forecasting skills. For example, students can practice forecasting the results of various risk-taking actions and the new tensions that may arise when these actions are taken.

The problem-solving archetypal strategy

Effective people intuitively employ a few archetypal strategies in all areas of life, and these practices have been used (either consciously or unconsciously) throughout history. An archetypal strategy is generic and universal. Its use crosses all domains of life. For example, the archetypal problem-solving strategy can be applied to address a wide array of current social, mechanical, scientific, economic, or political problems, and it is likely that all cultures have either consciously or intuitively employed variations of this problem-solving process throughout history. An example of an archetypal strategy is the multistep problem-solving process:

1. Identify the critical features of the problem.
2. Brainstorm possible solutions.
3. Evaluate possible solutions.
4. Evaluate.

Click here to view Figure 7.Sample Risk-Taking Analysis form

Sample Risk-Taking Analysis form depicting relationships associated with JFK's use of federal marshals to enforce federal policies concerning school integration and the Civil Rights Movement. (Note. Copyright 1997 by Edwin S. Ellis. Reprinted with permission.)

A variety of curricular materials have been developed over the last several decades that are designed to teach problem solving (e.g., Schlichter & Palmer, 1993), and most address the five- or six-step process via direct instruction. That is, the strategy is first explained to the learner, and then its application is systematically coached. Few, if any, of these curricular materials have capitalized on using the archetypal strategy as a means for helping students develop a greater understanding of content-area subjects.

Comprehension of both current and historical events can be enhanced if students can identify the problemsolving strategy of key persons. For example, one approach is to have students reconstruct how the strategy might have been used during specific historical contexts.

Example: Problem-solving analysis form

The Problem-Solving Analysis form is a graphic organizer designed to facilitate recognition of the elements of the problem-solving archetypal strategy.

In the example shown in Figure 8, the Problem-Solving Analysis form was used to examine the Berlin Crisis that JFK faced in 1961. The first three elements of the graphic (critical features of the problem, the problem, and the goal) represent the first step in the archetypal strategy identifying critical features of the problem. To facilitate understanding of the event, the teacher provides students with background information about the crisis so that these three components can be completed. The teacher might show students pictures of the Berlin Wall, read a letter written by a West Berliner about the new wall that clearly expresses her fear, and show students a video of old TV news segments about the Berlin Wall.

The next step of the strategy, brainstorming possible solutions, is represented by "Potential Solutions." Instead of telling students what JFK's solution to the crisis was, the teacher can have students forecast some likely solutions that JFK might have considered. During the forecasting process, the teacher acts as a mediator, cuing students and giving hints as needed to help them think through various alternative solutions. Once the possible solutions are identified, the teacher facilitates a discussion about the merits of each. Thus, the third step of the strategy, evaluating possible solutions, is incorporated into the instructional process.

The next step of the archetypal problem-solving strategy, implementing the best solution, is noted on the graphic in the area labeled "Solution Implemented." The teacher then provides students with the necessary background information about what JFK actually did to address the Berlin Crisis, a film of JFK's famous Berlin speech is observed, and students determine what essential information about JFK's solution should be noted on the graphic.

The last step in the strategy, evaluation, is represented in the sections on results and spin-off tensions. A combination of factual information provided by the teacher and student forecasting is used to analyze and evaluate the outcomes of JFK's famous Berlin speech. The teacher mediates the forecasting process by asking students leading questions, such as, "After JFK gave that speech, how do you think Khrushchev reacted?" "Do you think this was a positive or negative outcome?" "Why?" "How do you think the free world reacted to the speech?" "Do you think this was the reaction JFK wanted?"

Thus, use of the Problem-Solving Analysis form can facilitate greater understanding of a specific historical event as well as of the problem-solving process. The problemsolving graphic can be used to analyze a wide array of historical or current events, and it can be used as a planning form when students are learning to use the problemsolving strategy themselves.

Tension/reaction, risk taking, and problem solving are three of several archetypal patterns that are emphasized in watered-up classrooms. Teachers will likely find that the more familiar students with cognitive disabilities are with these patterns, the more readily they will understand complex content-area concepts. Likewise, teachers may also find that

overlaying these patterns with reading and writing assignments results in considerably improved performance in these areas.

Goal 4: More emphasis on developing relational understanding and knowledge connections to real-world contexts

In watered-up classrooms, instruction is designed to facilitate students' connecting new knowledge to their background experience and knowledge (Wansart, 1995). Ideally, students will develop many metaphoric Connections as a result of exploring core ideas. These connections occur when students recognize how the central idea or its critical features relate to others in a different genre. Metaphoric connections may be the strongest when new ideas are related to something from students' real-world or actual experience. For example, if students recognize how the extreme forms of discrimination and segregation and the violent acts of the Ku Klux Klan that characterized the United States early in the JFK administration is similar to the current emphasis on ethnic cleansing in Bosnia, they are forming metaphoric connections. If they can also relate ethnic cleansing to current, real-life experiences (e.g., similarities between ethnic cleansing and cultural elitism associated with high school fraternities and gangs), then they are really beginning to more fully understand the core idea.

Click here to view Figure 8.Sample Problem-Solving Analysis form

Sample Problem-Solving Analysis form depicting JFK's implementation of the problem-solving archetypal strategy during the Berlin Crisis. (Note. Copyright 1997 by Edwin S. Ellis. Reprinted with permission.)

Understanding of a core idea can also be greatly enhanced if the concept is explored within a problemsolving context (Newman & Wehlage, 1993). For example, the concept of cultural elitism can be explored from the perspective of how the practice can lead to social problems; it can also be analyzed from the perspective of the types of social problems the practice is responding to (e.g., gangs are a contemporary form of social elitism; many youth join gangs because they feel disenfranchised and do not have a sense of belonging or family because the father is absent from the home and the mother is busy struggling to survive).

Example: "Take it or leave it and recognize its disguises" form.

The Take It or Leave It and Recognize Its Disguises (TLRD) routine (Ellis, in press) is an example of a procedure for analyzing positive and/or negative features of targeted concepts relative to contemporary life. The procedure is also designed to facilitate metaphoric connections by focusing on the generic nature of an idea and how it might be manifested in today's world in various ways. Figure 10 illustrates a completed TLRD form about a concept, "social activism," that was associated with the Civil Rights Movement that occurred, in part, during JFK's administration.

The teacher may co-construct the graphic with students as a concept is analyzed, or students may construct the graphic while working collaboratively after the concept has been explored with the teacher. The activity requires students to analyze a concept and decide whether to "take it" because it is potentially positive, or to "leave it" because it is potentially negative. In either case, students must identify a main idea and provide specific details supporting their argument. Thus, the explanation of their position, rather than the position itself, is what is actually important. To develop deeper relational understanding within a problem-solving context, students must also consider how society has promoted or inhibited a concept or behavior and whether these societal actions have been positive or negative.

Goal 5: More student elaboration

Metaphorically, the brain can be viewed, in part, as a "language tool box" that contains a variety of tools for learning, and one of the most powerful tools in that box is elaboration. Like a toolbox with many different sizes and types of pliers, there are many forms of elaboration. Elaboration strategies include paraphrasing or summarizing ideas or otherwise using one's own words to discuss a concept, generating questions about the information, forming predictions or hypotheses regarding what the material is really about, and creating mental images about how something looks, tastes, sounds, or feels. All of these cognitive strategies share a common trait: Each requires the learner to interact with the information, relate it to background knowledge in some way, and convert it in some manner while retaining its essential meaning (Newman & Wehlage, 1993; Pressley et al., 1987).

Of all the cognitive functions necessary for meaningful, lasting learning of semantic information, elaboration can be considered the most important, but the ability to employ elaboration strategies is one of the most common difficulties of students with LD. Deficits in short-term memory are not readily subject to improvement from training, but deficits in elaboration working-memory strategies can be markedly improved with informed strategy training (Pressley et al., 1987). Thus, *students who experience problems elaborating information should be taught how to elaborate rather than being provided opportunities to avoid school tasks requiring elaboration.*

Research has demonstrated that precise elaborations usually produce the best results, whereas imprecise elaborations can lead to erroneous understandings (for a review of this body of research, see Pressley et al., 1987).

Research also indicates that an important way the mind seems to process

a new idea is by seeking to under stand it in terms of how it contrasts with ideas already known (for a review, see DiSibio, 1982). Thus, *both* examples and non-examples help the mind to process new ideas. In the watered-up learning environment, a substantial amount of class time is devoted to creating opportunities for students to elaborate on the to-be-learned information by means of projects, role plays, cooperative learning activities, artwork, and so forth. To make time for elaboration, teachers spend less time presenting new information to students and more time allowing students to elaborate on the essential to-be-learned ideas.

Example: CONCEPT CLARIFYING Form. The Concept Clarifying routine is an example of a procedure students and teachers can employ to promote precise elaboration of a concept. For example, to complete the clarifying table, students must identify details that serve to clarify the core idea associated with a concept. They must also identify examples and non-examples (or appropriate and inappropriate applications), as well as identifying background knowledge connections from personal experience that they can relate to the concept in some way (see Figure 9).

Teachers can CO-construct clarifying tables with students as concepts are being explored, students can work collaboratively to construct them, or students can independently construct them when studying. Figure 10 provides an example of such a table that was developed for Gandhi's concept of peaceful resistance.

Goal 6: More emphasis on developing cognitive skills

One of the most important characteristics of a watered-up curriculum is the commitment of teachers to wed the development of cognitive skills with acquisition of conceptual knowledge. Simply put, students receiving a watered up curriculum learn bow to "be smart" as they learn the content-area subjects. Thinking skills are considered as an *integral* part of the curriculum that is of equal importance to the content being taught (Marzano, 1988).

Click here to view Figure 9. Sample Take It or Leave It and Recognize Its Disguises form

Sample Take It or Leave It and Recognize Its Disguises form depicting features of the concept of social activism. (Note. Copyright 1997 by Edwin S. Ellis. Reprinted with permission.)

World Gandhi's peaceful resistance

Big Idea using nonviolent ways to protest unfair government actions

Correct Usage	Clarifiers	Knowledge Connections
Selma/Montgomery "Silent march" protesting police not protecting Blacks trying to vote Incorrect Usage KKK's burning of city bus in Birmingham to protest Black's wanting to sit where they liked Example Sentence	Use to draw attention to injustice. Never use violence b/c protesters look bad. Unfair laws enforced w/ violence. Looks BAD! "High road" to change requires patience.	Police beating peaceful protesters with clubs & dragging them to jail. Students signing a petition to change a school policy about opening lockers to inspect them without student's permission.

Peaceful resistance seems like a very difficult way to make change happen!

FIGURE 10. Sample Concept Clarifying form depicting elaborations of Gandhi's concept of peaceful resistance…

Watered-up classrooms target three interrelated areas of cognitive growth, all of which concern higher order thinking skills: (a) habits of the mind, (b) information processing, and (c) learning strategies. For the purposes of discussion, these three areas have been artificially segregated; in reality, however, these areas overlap. An approach that is not used in watered-up classrooms is to address these skills in a decontextualized fashion (e.g., puzzles, games, and other activities designed to facilitate practice of these skills in isolation). Rather, students practice using the cognitive skills in the context of learning the content area subjects.

Habits of the mind.

Habits of the mind (Gardner, 1991; Marzano, 1988; Schlichter & Palmer, 1993) are analogous to basic academic skills, serving as the core of effective cognitive functioning. Many teachers attempt to emphasize these skills in various ways and levels of intensity, but instruction in skills related to habits of the mind is typically incidental and occasional; in the watered-up classroom, these skills are overtly targeted for instruction on an ongoing basis. This means that students are specifically instructed in what these skills are, why they are important, and how and *when* they are used; students are also provided ongoing feedback and even graded on how well they are using these skills. In short, habits of the mind need to receive treatment similar to informed strategy training (Brown, 1978). Thus, habits of the mind become an integral part of the curriculum students are

expected to learn.

Unfortunately, many teachers perceive less sophisticated learners (e.g., those with LD) as incapable of engaging in higher order thinking skills and thus provide minimal opportunities for these students to practice them (Schlichter & Brown, 1985). Although less sophisticated learners tend to be less skilled at performing higher order thinking skills, and they often require more time to process information, the common belief that these students cannot engage in these skills is largely a myth. It is often assumed that these learning activities are inappropriate for students with mild cognitive disabilities, so some educators commonly deny them opportunities to even try. Imperative to remember is that a less sophisticated, superficial, and even erroneous response to a higher order thinking opportunity is considerably better than no response at all. Denying less sophisticated students opportunities to engage in these kinds of cognitive activities severely reduces their chances of developing thinking skills. Watered-up classrooms emphasize the following essential thinking skills (based on the work of Gardner, 199 1; Marzano, 1988; Newman & Wehlage 1993; Renzulli & Reis, 1994; Schlichter & Palmer, 1993):

- Forecasting
- Resisting impulsiveness
- Engaging in challenging tasks
- Persisting during tough times
- Using information resources
- Being committed to quality and accuracy
- Noticing how you and others think
- Being committed to organization and clarity
- Using and keeping time lines
- Being open-minded
- Viewing ideas in unusual ways
- Presenting ideas in creative ways

Informaiton processing skills.

Information processing skills enable students to recognize when more information is needed; identify and use resources to locate and make sense of new information; discriminate essential from nonessential data; and organize, structure, and communicate information in appropriate ways. For example, activities that involve students' conducting research projects and then designing and presenting displays showing what they have learned help students not only learn the content but also develop information processing skills.

Learning strategies

In addition to teaching students archetypal strategies such as the five- step problemsolving strategy previously discussed, teachers should instruct most students with cognitive disabilities in learning strategies that target essential setting demands of school (Deshler & Lenz, 1989). Specific learning strategies are taught so that students can meet these setting demands in an effective and efficient manner. All students use learning strategies. The problem is that some of the strategies used are very inefficient and ineffective. For example, many students use very poor test-taking strategies but, when taught more effective ones, improve their scores on classroom tests an average of 15% (Hughes, Schumaker, Deshler, & Mercer, 1988).

Many teachers address study skills and learning strategies in their content classes, but these skills are rarely systematically targeted and taught in a sufficiently intensive manner to result in students' actually becoming proficient at using them (Pressley, Borkowski, & Schneider, 1989; Scanlon, Deshler, & Schumaker, 1996). Study skills and learning strategies-like content-area subjects-are too often taught superficially. Teachers striving to provide watered-up classrooms address *fewer* learning strategies, but they address the strategies they teach in a more in-depth manner to ensure that students thoroughly learn and use them. Such teachers also design activities that require use of the strategies and provide feedback and even grading on students' strategy performance.

Example: Cross course instruction in the power writing strategy.

POWER writing (Schumaker, in press) is a strategy designed to make the steps of the writing process more explicit for students (see Figure 11).

To maximize the impact of POWER, the teacher should use it in multiple contexts. What makes cross-course instruction in the POWER strategy effective is that it can be taught not only in language arts, but also in all of the student's other courses (Ellis, 1994a, 1994b).

For example, the language arts teacher may use the strategy when students write author studies, while the social studies teacher uses it when students write current event reports or give oral reports; the science teacher can adapt POWER so that it is appropriate for writing lab reports. The special education teacher can provide more intensive and extensive instruction in its use in the resource setting. The result of cross-course instruction in a learning strategy is that students are considerably more likely to thoroughly internalize and generalize it.

Many teachers have indicated that they value thinking skills instruction, but they are reluctant to invest too much class time in it because they think it reduces opportunities to teach more content. First, although content area knowledge (e.g., science, social studies, literature, etc.) is important, little of this kind of knowledge will be crucial to the relative success that students experience as adults- particularly as it is taught in the watered-

down curriculum. What will be crucial are the skills involved in acquiring and using information. In short, *students' success as adults will depend largely on the degree to which they employ, on a day-to-day basis, higher order thinking and information processing skills.*

Second, it is true that having students engage in activities designed to practice and develop thinking and information processing skills takes considerable time if it is done in a meaningful and effective manner. However, when instruction in the content area is integrated with instruction in thinking and information processing skills, understanding and memory of the content will be much greater than when higher order thinking and information processing activities are eliminated in order to create more time for covering more content.

Conclusions

The accommodations approach to curricular modification has a number of merits, especially those associated with how students are assessed. Unfortunately, accommodations often result in a watering down of the curriculum, which entails the assumption that students with cognitive disabilities are incapable of developing higher order thinking skills. The result is that they are taught less content that is, moreover, divorced from any meaningful context. It is no wonder that these students are bored. Two ideas are central to watering up the curriculum. First, instruction should facilitate deep understanding of core ideas and meaningful learning. Second, instruction should strive to change the child in fundamental ways.

Figure 11

Power writing strategy

Plan

Predict who will read this & what you hope will happen when they do.

List the title, main ideas, and details.

Order

Decide which main idea to write about first, second, etc. & note order on the think sheet.

For each main idea, note the beef order for presenting the details on the think sheet.

Make sure the orders are logical.

Write

Begin with a sentence or two that activates the reader's knowledge about your subject.
Introduce the topic and main ideas in the first paragraph.

Use cues to signal ideas.

Write about each main idea in the following paragraphs: explain with details.

Tell yourself positive statements about your writing and tell yourself to write more.

Edit

Check to see if the overall paper makes sense. Read if out loud to someone.

Conference with a peer for feedback.

Check to see if each sentence makes sense and if it's complete.

Check for COPS errors

- Capitalization
- Omissions
- Punctuation
- Spelling

Revise

Copy your paper over neatly.

Check once again for any errors.

References

Edwin S. Ellis (2002)

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