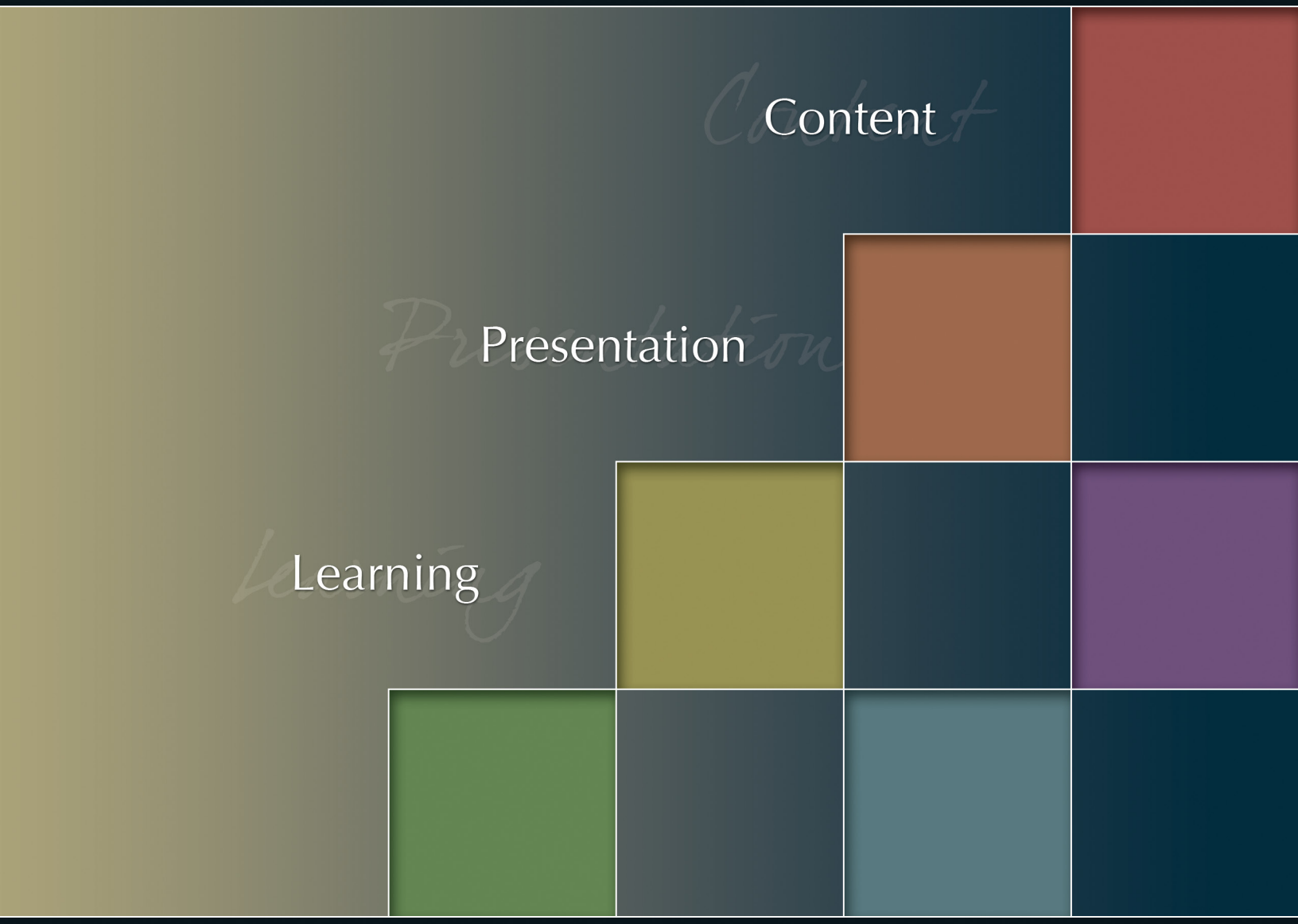
Priorities for Evaluating Instructional Materials:
Research Update



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http://www.fldoe.org/bii/instruct_mat/

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Preface

This 2008 report adds research findings from the last 9 years to the original research Florida practitioners and evaluators used in 1999 to develop the major priorities for evaluation of K-12 instructional materials. The Office of Instructional Materials, Florida Department of Education, funded this update of the research to ensure that the Florida instructional materials adoption process incorporates the most up-to-date research in support of evaluating the effectiveness of K-12 instructional materials.

For the 1999 report (*Destination: Florida classrooms—evaluator's handbook*), the Florida Department of Education, in conjunction with broad-based teams of educators and evaluation specialists, identified, reviewed, and field-tested the major priorities for evaluation of instructional materials for use in grades K-12. The three priorities were ***content, presentation, and learning***. From a review of research, these teams developed the criteria within these priorities, the evaluation forms to support the process, and an evaluator's handbook containing a report of the related research.

A comprehensive search was conducted of all primary sources in the educational field to identify research on evaluating instructional materials published since 1999. The search included, but was not limited to, the following:

- States that employ a textbook adoption system which were contacted for updated information on their textbook adoption process and criteria include: Alabama, Arkansas, California, Florida, Georgia, Idaho, Indiana, Kentucky, Louisiana, Mississippi, Nevada, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Virginia, and West Virginia.
- The Dialog Databank to search all the social sciences databases (e.g., British Education Index, Dissertation Abstracts Online, ERIC, PsychInfo, Social SciSearch, Wilson Social Sciences Abstracts, ProQuest, and Expanded Academic ASAP).
- Government agencies
- Laboratories and centers
- Associations and other non-profit organizations (the National Association of State Textbook Administrators [NASTA] and "Simba Information's 2007 National Textbook Adoptions Scorecard and 2008 Outlook" for relevant information and research).

Introduction

Among the states in the U.S. that use a textbook adoption process, Florida, California, and Texas have come to wield a great amount of influence because of a demographic shift to the West and South (Sewell, 2005, ¶14). Regulations in these states influence the quality of instructional materials by setting criteria and curriculum standards, which influence the content, format, and quality of instructional materials sold throughout the country (Apple, 1989; Oliveira, 1995).

To ensure that the instructional materials chosen for Florida's schools contain the elements that make them effective, the state has developed a system of evaluation that is built upon a strong foundation of research. By using an extensive research base and a thorough review process, Florida has identified the *priorities* for evaluation of instructional materials as **content, presentation,** and **learning.**

These priorities focus the attention of evaluators on what is most important in the evaluation criteria. As a result, they can apply the criteria consistently to each submission. This consistency allows the materials to be judged fairly so that choices will be made on the basis of *informed research findings* rather than "on the basis of personal, idiosyncratic perceptions" (Young & Reigeluth, 1988).

The research contained in this report allows evaluators of instructional materials to engage in systematic reflection of the procedures they follow and decisions they make about the quality of materials. As a result, evaluators—through their use of a thoughtful and thorough adoption process—become the most powerful influence in improving the quality of published materials (Komoski, 1992, cited in Carnine, n.d.).

This report, similar to *Destination: Florida classrooms—evaluator's handbook* (1999) includes information on the importance of the criteria, the selection and responsibilities of committee members who review materials, and the process for evaluation of instructional materials submitted for consideration in grades K-12 in Florida. When the adoption criteria, forms, and procedures were field-tested in 1999, participants described the priorities as "specifically written so as to assist in this process," useful for "pre-adoptions" as well as for "all districts," and "very useful for the classroom teacher." This 2008 report is expected to continue to successfully serve the Florida instructional materials adoption process.

Statewide Adoption in Florida

The state of Florida expects instructional materials submitted by publishers to meet criteria within each of the major priorities. Thus, to make the current research most useful to evaluators, the major findings have been organized and summarized in this 2008 report to address the evaluation criteria within each of the three priority areas. Within these areas, evaluators can find the key issues to consider when reviewing instructional materials; within the area of learning, evaluators also can find a review of the key strategies for instruction and assessment for major types of learning outcomes.

Florida's system of adoption has been designed to assure integrity in the evaluation and selection of instructional materials.[1] The formal procedures of the system itself, as well as the members of its instructional materials committees, are expected to operate with a degree of trustworthiness and incorruptibility that prevents unfairness and dishonesty in the selection of materials. Such integrity includes procedures to prevent the undue influence of lobbying, special-interest groups, or other political interests (Oliveira, 1995; Watt, 1991). Florida's system of adoption includes committees at the state level to review instructional materials for individual subjects and grade levels. These committees ensure that instructional materials comply with state regulations and expectations about the curriculum for a subject area.

A formal system for instructional materials adoption offers the following additional benefits:

- greater continuity in education for students who change from one school to another;
- support for local districts in making informed choices from the wide array of instructional materials that are available; and
- identification of materials that closely match required curriculum standards.

Many of the other adoption states have components similar to those in Florida (Apple, 1989; Ball, 1990; Otfinowski, 1991).

Florida Statutes, Chapter 1006, §1006.28 through §1006.43 describes the process for adopting instructional materials that will be purchased with state funds. School districts purchase materials through the depository of the publisher with whom a contract has been made and that depository provides distribution of materials. The review process is intense, thorough, and systematically supported by information and training systems of the Florida Department of Education.

1. For purposes of state adoption, "instructional materials" means items having intellectual content that by design serve as a major tool for assisting in the instruction of a subject or course…The term does not include electronic or computer hardware even if such hardware is bundled with software or other electronic media, nor does it include equipment or supplies (State of Florida, Florida Statutes, Title XLVIII, Chapter 1006, Section, 29 [4]). However, because of advances in educational technology, the *major tool, ancillary* materials that support the major tool, and *supplemental* materials may come in many forms. For instance, Florida recently added *FreeReading.net* as a supplemental reading program (Reuters, 2008).

Evolution of Instructional Materials Design

Responsiveness by Publishers

Publishers attempt to develop instructional materials that meet the standards set for formal statewide adoption. They generally begin with a literature review by the author and the editorial staff; at the same time a review begins to identify the state and national standards, which are "divergent, and increasingly specific" (Baughman, 2008, p. 89). Market-research teams then gather information from teachers and administrators about their perspectives and information on the best instructional practices.

Next, they create prototypes and gather continual feedback from teachers about "quality of content, organizational structure, pacing, usability," and other features (Baughman, 2008, p. 90). Publishers document the alignment of their materials with state standards, and overall, meet the curricular standards established nationwide for subject areas (Watt, 2002, p. 40).

Much effort goes into supporting alignment with standards. The Educational Products Information Exchange (EPIE) helps school districts align their textbooks to their objectives more efficiently (Otfinowski, 1991). The National Center to Improve the Tools of Educators (NCITE) works cooperatively with publishers, generally at no charge (NCITE, n.d.). Publishers continually refine and reshape their products through their contacts with teachers and schools with activities such as focus groups, teacher pilot projects, presentations during evaluation procedures, and inservice training to support teachers in using their materials (Tyson, n.d.).

Effective materials include certain components. The major tool generally is accompanied by a teacher's manual, test items or resources, a study guide, and activity guide (Ornstein, 1992).

In addition, effective materials usually include the following features:

- instructional goals with adaptability to course requirements
- accurate, relevant, and relatively up-to-date information
- well-organized, coherent, and unified flow of information
- appropriate reading level and vocabulary
- effective layout, visual presentation, and physical features
- absence of stereotypes and biases
- multidisciplinary content with multiple rather than single perspectives
- small concepts taught as variations on larger themes
- development of insight and thinking skills rather than just memorization of isolated or unrelated facts
- real-world applications of informational skills
- inclusion of supplemental and reference materials for teaching (Ball, 1990; Siegel & Sousa, 1994; Tyson, n.d.).

Formats of Instructional Materials

The National Association of State Textbook Administrators (NASTA) provides a network of support for publishers, which links to the National Instructional Materials Accessibility Standard (NIMAS); it also furnishes information and guidelines about specialized formats needed to comply with accessibility legislation that must be delivered before print instructional materials arrive at the schools. Specialized formats include Braille, audio, digital text, and large print. For such materials, publishers must meet technical specifications in preparing and delivering instructional materials for review and adoption. The Florida Department of Education provides specifications for alternative formats, or links to such information, in the packets prepared for publishers.

Textbook Dominance

Although this may change in the not-too-distant future, textbooks remain the main curriculum guides. They are the most frequently used instructional material for students and teachers at all grade levels beyond primary grades. The amount of classroom time that students spend using textbooks is estimated at 75 to 90 percent (Ajayi, 2005; Risner, Nicholson, & Webb, 2000; Watts-Taffe, 2005; Wiley & Barr, 2007; Sadker & Zittleman, cited in Blumberg, 2007, p. 144; Stein, Stuen, Carnine, & Long, 2001).

The Teacher's Manual

The teacher's manual is a key presentation feature that can be a strong selling point, especially if well designed. It contains instructional resources to support instructional strategies and activities, and its organization affects how well it can be adapted and used in the classroom. Teacher manuals and student instructional materials work well when they have the following basic features:

- *Practicality*: clear layout, easy to use, durable over time, cheap enough to buy
- *Alignment:* teacher content and activities align to student materials
- *Coverage:* enough content to give teachers more time to prepare lessons; guidance on teaching procedures, cultural aspects, a plan for each lesson, enough information about topics and answers; information about what parts students may find difficult and ways to explain difficult parts
- *Readability:* easy to understand with clear objectives and instructions
- *Methods:* information on how students learn the subject, and/or reasons for using certain activities and methods; variety of activities or plans; methods for large and small groups; different learner contexts; different styles of learning
- *Assessment:* ways of evaluating learning
- *Management:* classroom management support such as outlines for planning and organizing courses, units, and lessons; ways for teachers to become more confident with their teaching skills (Ajayi, 2005: Ornstein, 1992; Joyce, Weil, & Calhoun, 2004 ; Gleason & Isaacson, 2001).

Technology Changes

Changes in technology over the last seven decades have made *visual presentation* almost as important as content; in fact, presentation often overshadows the information itself. With the expansion of technology, even more specialization features, such as graphic design, photography, and typefaces, have emerged. These types of features as well as titles of materials have become increasingly important.

Visual Presentation

Presentation. Research in the 1920s found that serif *typefaces* are read more quickly and easily than sans serif (Schriver, 1997). Research has since shown that firm lines with open, even spacing are more important than typeface in ease of reading (Hartley, 1994). In addition, the last three decades of computers, electronic typesetting, and laser technology have offered an abundance of new typefaces, which many publishers have used for attention or aesthetic appeal without regard to impact on learning.

In the late 90s, many publishers began investing in multimedia systems in which the textbook was just one of the parts. Such systems include program related add-ons, such as pre-built tests and exercises, fully annotated editions of textbooks, and support in the form of CDs, audiocassettes, and videodiscs (American Textbook Council, 1998).

Organization. Any of the materials presented in various media will be more effective than conventional classroom instruction when they are *organized systematically* with a deliberate structure and sequence. Haphazard or poorly designed activities will not be as effective, even if they are computer-simulation activities. For example, the most common problems identified in *hypermedia* instruction include "disorientation, getting lost in hyperspace, lack of a sense of size, limits and current position in the whole, and difficulties in locating relevant information sources" (Gokhale, 1996; Montague & Knirk, n.d.; Nguyen, 1999, p. 3).

Computer courseware. Computer technology has become popular, and computer courseware offers much more than fun and games. Research shows that computer-assisted instruction (CAI) and computer-based instruction (CBI), *when combined with regular instruction*, can improve the attitudes, motivation, and academic achievements of students. According to a review of nearly 200 studies comparing CBI with conventional elementary, secondary, and classroom instruction, CBI raises student achievement, gives students a better appreciation of technology, and improves their attitudes toward schools and teaching (Crowl, Kaminsky, & Podell, 1997; Montague & Knirk, n.d., p. 3).

Gains do not result simply from the use of computers, but from using an instructional systems design that carefully plans the content, provides for active student participation, and allows students to progress at their own rate.

Computer-mediated communication. Applications of *computer-mediated* communication that have been effective in improving both lower- and higher-order thinking skills include the ones listed below:

- practicing inference skills and problem-solving strategies
- building skill in areas such as verbal analogies, logical reasoning, and inductive/deductive thinking
- drilling and practicing, which incorporate probes or tests
- instruction in a wide range of subjects, including literary comprehension and interpretation, biomedical cognition, history, and military strategy situations
- practicing complex skills that would be too difficult or risky to practice in the actual performance environment

(Casey, 1997; Cotton, 1997; Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998; Mitchell, 1994; Montague & Knirk, n.d.; Rada, 1995).

Multiple-media/hands-on learning. Research supports the use of *multiple media* and *hands-on learning*.

For example, students remember only 10 percent of what they read; 20 percent of what they hear; 30 percent if they see visuals related to what they are learning; 50 percent if they watch someone do something while they are explaining it; but almost 90 percent if they do the job themselves, even if only as a simulation (Menn, 1996, as cited in Gokhale, 1996, p. 36).

These types of findings may explain why simulations often support thinking, reasoning, and transfer of learning (Gokhale, 1996; Mayes, 1992).

As will be illustrated in the next section, even more sophisticated applications of technology, with greater levels of interaction, are on the horizon. In one project, an e-book had the capability to interact, using real objects such as books or CDs for activating searches, and could recognize and respond to hand positions (Koike, Sato, Kobayashi, Tobita, & Kobayashi, 2000). However, for now and the near future, textbooks remain the main curriculum guides.

E-learning

Clearly, the use of technology has expanded and now includes supporting media, computer files, CDs, e-books, games and simulations, online Web lessons integrated into teaching strategies, Florida's Virtual School, and Florida's adoption of an open-source reading program for K-3 supplemental reading programs for the 2008-2009 school year:

> FreeReading.net is the first open source instructional program to be approved through an official state adoption. The Florida decision, along with educators' strong positive response to the program, indicates that school systems will consider alternatives to the traditional printed textbook…Because FreeReading.net is already available and doesn't require that textbooks be printed, some Florida schools are considering the program for use this spring (Reuters, ¶1, ¶4).

Integration of technology with instructional strategies has expanded across all curricular areas of K-12 education. The Educational Technology Clearinghouse provides resources to support instructional strategies in the arts, foreign languages, health, language arts, mathematics, physical

education, science, and social studies for Grades K-12, with links to research on educational research. Florida's 21st Century Community Learning Centers Program provides online support in mathematics, science, arts and music, recreation, technology, parental involvement, family literacy, drug and violence prevention, health and fitness, reading/literacy, and promising practices (University of Florida, 2005).

Florida's first Internet-based public high school, in a venture with AT&T, was founded in 1997 as a pilot project (AT&T Knowledge Ventures, 2007). It partners with all 67 districts of Florida (IMS Global Learning Consortium, Inc., 2008). The courses are delivered over the Internet and "teachers communicate with students and parents via phone, email, online chats, instant messaging, and discussion forums" (¶7).

Implementing E-learning

School readiness for e-learning. The NASTA network includes links to the Software and Information Industry Association (SIIA) presentations. SIIA has 12 education board members (Apple, Kaplan, Pearson, Scholastic, ETS, Learning.com, Red Hat, Siboney, Inspiration, McGraw-Hill, STI, and Thomson) who advocated for technology applications in education. In its Winter 2007 presentation, SIIA reported the following statistics about school readiness for eTextbooks from data reported by NCES and NetDay:

- internet access: 99 percent schools/93 percent classrooms
- student-to-computer ratio of 4.4:1
- 75 percent of teachers incorporate Internet materials into lessons
- 78 percent view technology as an asset in meeting standards
- 74 percent of K–6 and 91% of 7–12 students report that technology helps them with their schoolwork.

Online learning. "Based on information from the 2004-05 and 2005-06 school years, Florida TaxWatch found that FLVS students consistently outperform their counterparts in two critical areas: test scores and grades earned in courses" (Pozo-Olano, 2007). In 2006-07, the school served "more than 50,000 students in 80,000 half-credit courses in Florida" (IMS Global Learning Consortium, Inc., 2008, ¶3). The school also received awards for excellence from 2000-2007 (¶2).

Luik and Mikk (2008) summarized previous research describing how computers can be used to provide individual guidance, give immediate feedback, increase interaction, and accommodate individual pacing. Computer-based, online instruction has been effective in a wide range of subjects, including literary comprehension and interpretation, biomedical cognition, history, military strategy situations, and physics. When combined with classroom instruction, it has been shown to improve student attitudes, motivation, and achievement including practicing thinking and problem-solving skills and in simulations and practicing skills too difficult or risky to practice in a real context (Montague & Knirk, n.d. 5 of 13; Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998; Cotton, 1997; Mestre, 2001, pp. 11-12; Pol, Harskamp, & Suhre, 2005; Rothman, 2000).

Design and Use of Technology

Student characteristics can influence how much they benefit from the use of technology. Artino (2008) reported that students who can self-regulate, possess self-efficacy, and who collaborate and seek success from others will be more successful with online learning. Few students will use thinking skills in online discussions without explicit guidance. Students will have difficulty with cognitive overload, error messages given in a negative rather than a positive way, and poor presentation style (Mikk and Luik, 2003).

Use for low-ability students. Low-ability students benefit from illustrations, while animations were helpful for both low- and high-ability students; however, low-ability students became more easily confused if they were required to make non-sequential choices and were unfamiliar with a program or had mismatched reading levels (Luik & Mikk, 2008). Analogies helped students make connections between concepts; self-assessments improved test scores; and features of multimedia made more of a difference for students with lower prior knowledge (pp. 1488-1490).

Low-achieving students vs. high-achieving students. Low-achieving students benefit from clear instructions, guidelines for self-assessments, familiar icons, examples, many questions (rather than fewer for high-achievers), feedback on percent of correct answers, use of a mouse, and answering from the keyboard. Low-achieving students learn less with complex graphics, oversaturation of terminology, complex presentation of text and graphics, too much hierarchy in navigation, and too many navigation tools. High-achieving students benefit from key combinations, menus with different levels, use of the Internet, analogies, fewer terms in the content, and more learner control.

The text with more symbols, formulas, and subject terms was actually more difficult for the high-achieving students. Luik and Mikk (2008) explain the difference: high-achievers seek to understand the content rather than memorize the terms, symbols, and formulae; low-achievers seek to memorize the terms, symbols, and formulae (p. 1490). This kind of explanation suggests that if the content and test items were well-aligned, results might have been different. The results and discussion illustrate the importance of aligning any test with the objectives of the content. Only then can one make reasonable inferences about the results.

Challenges for Evaluation Committees

Major Tool, Ancillary, and Supplementary Materials

Evaluation committee members must distinguish the major tool (materials that can stand alone to teach an entire course) from the ancillary tool (materials designed to be used with the major tool). The major tool and priced ancillaries can be adopted for use in Florida's K-12 classrooms. The publisher submission will identify the course for which the submission materials are intended, but committee members must compare the adequacy of the alignment.

Contacts with Publishers

The role of serving on an evaluation committee creates high visibility. Some types of contacts with publishers are acceptable, while others may create conflicts of interest or violate legal and ethical responsibilities. Having members sign an affidavit form before the subject area adoption committee meets provides assurance of compliance with protocols to faithfully discharge the duties of the committee and remain free of conflicts of interests, including refusing rewards from those who have an interest in adoption of the materials that will be reviewed. Publishers and their representatives are not allowed to have any direct contact with committee members to discuss adoption procedures or instructional materials. Violations of these required protocols constitute a second-degree misdemeanor and can result in loss of an individual's position.

Members of instructional materials committees may not participate in publisher-sponsored pilot programs for a course or subject being considered for adoption by the member's committee.

Publishers must have equal opportunity and time for a given subject area and grade level to make presentations. During committee meetings at which publishers are present, committee members may ask publishers questions related to content or selection of materials. The Florida Department of Education recommends the protocol for publisher presentations to ensure fairness of representation.

Marketing Features

Evaluators must distinguish between features designed to *sell* the instructional materials and those designed to support effective *learning*. Sales or marketing features include flashy treatment of materials, appeals to limited budgets, managerial simplicity, and economies of scale for different instructional packages.

Sorting out *flashy treatment* from solid *instructional design* is particularly important because this type of treatment not only diverts attention from instructional quality, but it also often can highlight key ideas that are misleading (Sewell, 2005). For example, elementary-, middle-, and high-school science and math textbooks have been found to contain random, unrelated topics and facts with boldface type for so-called "main ideas" (Mestre, 2001, pp. 8-9). But the "main ideas"

are only definitions and facts, not actually ideas. In addition, there is a failure to highlight the few conceptual explanations that are provided, with questions in the materials being "what" rather than "why" types of questions that emphasize recall, not thinking or application (Mestre, 2001, pp. 8-9).

Sewell (2005) brings up another important point about "flashy treatment;" he cautions that when the glitz is removed, "what text remains is dense and often unintelligible" (¶20). For instance, many social studies and history books have "supercharged graphics" with "thin" content and may contain incoherent, incorrect, shallow, and bulging encyclopedic content (Sewell, 2000, pp. 2, 35; Caron, 2005; Goldstein, 2001; Mestre, 2001; Ravitch, 2004; Schaeffer, 2004; Sewell, 2000).

Challenges in Reviewing Content

Challenges in reviewing content are varied and numerous, including evaluating content that is controversial, inaccurate, or without scholarship; written by anonymous authors; or misleading.

Controversies

Controversy sometimes arises because of different beliefs about how best to approach a specific subject area. Historical controversies concerning teaching methods include whether to teach basic or higher-order skills; meaningful applications or discovery learning; facts, laws, and theories or the process of a discipline; verification exercises or inquiry applications; emphasis on relevant knowledge or personal development and social values and conflicts; a single method for each discipline or a variety of ways to accommodate different backgrounds and learning styles; and phonics or whole-language approaches to reading (Brophy, 1990, p. 361; Butyniec-Thomas & Woloshyn, 1997; Manzo, 1997a; Carnine, n.d.; Shymansky, Kyle, & Alport; 1983; Tyson, n.d., p. 6).

Controversies have also arisen because the policies of other adoption states have created problems that affect instructional materials made available for review in Florida. In Texas and California, politicians have overridden responsible committee decisions or exerted overriding power through their review board appointments. Pressure groups also were allowed to become "shadow authors" who pushed publishers to "gloss over sensitive and troubling subjects . . .", or promoted the moral values of a single group (Hoffman, Sailors & Patterson, 2000; Jago, 2002; Sewell, 2005; Watts-Taffe, 2005; Wiley & Barr, 2007; Sewell, 2005, ¶12; Wiley & Miller, 2007).

As a result, many instructional materials have reflected biased perspectives and avoided authentic controversies of the type that would activate analytical and critical-thinking skills, satisfy student preferences for good stories or essays on controversial topics, and provide more information that is relevant to the students' lives (Hoffman, Sailors, & Patterson, 2000; Jago, 2002; Sewell, 2005; Wiley & Barr, 2007; Lester & Cheek, 1998).

Inaccurate Content

Previous research cited in Florida's *Evaluator's Handbook* (1999), reported that materials often do not give topics the treatment they deserve, contain factual errors, or persist in presenting disproved concepts. Results of the current research review show that materials continue to contain factual

errors or present concepts that have been disproven (Goldstein, 2001; McClintick, 2000; McFarlane, 2001; Miller, 1992; Ornstein, 1992; Mestre, 2001; Putka, 1992; Schaeffer, 2004; Sewell, 2004; The Fordham Institute, 2004; Wade, 1993; Ornstein, 1991, Watt, 1991; Young and Reigeluth, 1988).

A few examples of errors, from the hundreds cited in the literature, include:

- defining Sputnik as a Soviet missile carrying a nuclear warhead
- giving wrong dates for "Germany's occupation of the Rhineland and the Emancipation Proclamation"
- reporting that "freed slaves were denied marital and other rights in the Black Codes, which in fact granted those rights"
- stating that the Earth rotates around the moon

(Miller, 1992, p. 80; Mestre, 2001, p. 3; Putka, 1992, p. B1; McClintick, 2000).

Sometimes, publishers also make mistakes in respect to alignment to standards. One advantage of the increasing popularity of online publishing and textbooks will be the comparative ease with which publishers can correct errors and change content to align with curricular frameworks. While error corrections can be made more quickly, the use of "fact checkers and computers" (Goldstein, 2001, p. 77) will do nothing to change the "fragmentary treatment of some fundamentally important concepts" (Nelson cited in Goldstein, p. 77; Pickreign & Capps, 2000; McFarlane, 2001).

Misleading Content Analysis

Publishers must show a correlation between their materials and the curricular requirements of other states, as well as Florida. But, the publishers' approach to correlational analysis may actually be the cause of many problems with content. It is a process that "occurs multiple times as the textbook is prepared, yielding books in which 'mentioning' is pervasive and depth of content is often sacrificed" (Fiore & Cook, 1994, p.337; Florida Department of Education, Sunshine State Standards (n.d.); Stein, Stuen & Carnine, 2001; Sewell, 2005).

Publishers cross-reference particular requirements with exact locations of key words found in their materials, producing long strings of page citations. These printed correlations are meant to prove the match with content. Cross-checking this level of results sometimes involves hiring a private contractor or purchasing a computer program. Such correlation reports, while an indicator of alignment, also can be misleading because the conspicuous evidence of alignment rests on finding key words, regardless of their treatment, in places such as titles, headings, terminology, indexes, glossaries, and text.

For example, in one document a publisher promoting the claim of teaching map skills, cited a page with a photograph of a teacher pointing to a map. Mentioning a required content topic is simply a first-level treatment; it does not satisfy the requirement for comprehensive content that targets higher learning objectives. This is a major *content analysis* issue. To reframe the issue with a metaphor: it is like counting a zillion grains of grits that are never mixed with water and salt and cooked over slow heat; instead, these abundant uncooked grains are served to the guests in a pretty

measuring cup. Too often, the publishers enrich it with a spoonful of sugar, a splash of cinnamon, a neat pat of butter, or a thin slice of cheese to make it look good. The nutritional components may be in place, but they are not integrated in a digestible form.

Content Additives

New content comes in the form of pieces of information added to already overburdened instructional materials without meaningful explanations, connecting ideas, underlying structures, or content for critical thinking. In one study, when asked about their perspectives, students highlighted similar problems: too much information, confusing information, unfriendly vocabulary, and irrelevant content (Caron, 2005; Goldstein, 2001; Mestre, 2001; Sewell, 2005; Watts-Taffe, 2005; Lester & Cheek, 1998).

Inclusion of dense factual information has pushed aside concepts, context, explanations, examples, strategic and higher level thinking, critical analysis, and evaluation. The disconnected facts fail to educate or motivate the students (Harniss, Hollenback, Crawford, & Carnine, 1994; Ornstein, 1992; Ravitch, 2004; Sewell, 2004, 2005; Nelson cited in Jehlen, 2000, p. 1).

Thoughtless Content

Some materials cover required content by including a mere tidbit, word, phrase, or heading to cover a topic, with little or no thought-provoking material and content that wanders between the important and the trivial. Exhaustive, encyclopedic information broken into disjointed pieces leaves little room for connections among ideas, meaningful explanations, critical-thinking skills, or development of principles. As a result, students may be able to recite facts with little or no understanding of their relevance to conceptual structures or to higher-level thinking (Harniss, Hollenback, Crawford, & Carnine, 1994; Manzo, 1997; Ornstein, 1992; Tyson, n.d.; Watt, 1991; Woodward & Tyson-Bernstein, 1986).

Multiple reviewers of instructional materials have found the omission of thought-provoking content to be unacceptable. Examples of better approaches that would promote meaningful thinking include the ones listed below:

- *Example of science content*: "Explain how you can smell an open bottle of vinegar even though you are across the room. What is actually reaching your nose? How did the vinegar molecules get into the air? How did the vinegar molecules reach your nose?" (*Matter and Molecules* unit by Michigan State University and the Michigan Department of Education, cited in Jehlen, p. 1)
- *Example of history content*: "What really creates the 'wretched, exploited condition of women' in many parts of the Muslim world (Sewell, 2003, p. 19); "How does Muslim oil influence international politics? Petroleum and its royalties have dominated the politics of the Middle East for 80 years -- why is this so and why is this unlikely to change?" *(Sewell, 2003, p. 29; McClintick, 2000; Caron, 2005; Goldstein, 2001; Harniss, Hollenback, Crawford, & Carnine, 1994; Mestre, 2001; Ornstein, 1992; Ravitch, 2004; Sewell, 2000, 2003, 2004, 2005; The Fordham Institute, 2004).*

Reactionary Content

Like *The Mad, Mad World of Textbook Adoption* (The Fordham Institute, 2004), which was highly critical of the process, Schaeffer (2004) concluded that "beneath the glitz, texts are hobbled by political correctness, shallowness, incoherence, even factual errors" (¶1). Publishers often cave in to pressures from peripheral single-interest groups. Ravitch, who wrote the introduction to *The Mad, Mad World*, attended the earlier CATO Institute conference on textbook adoption and reported that it is not permissible now to "show an older person seeming old" (The Fordham Institute, 2004, p. 29; Sewell, 2005; Monroe, 2007a).

This reactionary response is not new. During the civil-rights movement of the 1960s, publishers started downplaying the role of whites and portraying them as marauders while holding up American Indians and other minorities as "noble savages" and victims (Learner, cited in Manzo, 1997). At the same time, the school districts had begun to include parents and pressure-group leaders on selection committees. In this context, it makes sense for publishers to respond to the pressures, because in many cases, "those with the most persistent and organized voices have held greatest sway in selection proceedings, even when their opinions have not been representative of the larger community" (Barker & Matveeva, 2006, p. 11).

But many groups see a growing problem with the substitution of one bias for another, the absence of patriotism, and a downplaying of traditional values rather than giving a balanced contextual perspective. Schaeffer (2004) reported on those who advocate for teaching about the Bible in constitutionally-compliant ways, our country's founding principles, cultural literacy, and environment and life science.

Schaeffer summarized the importance of content by quoting Bob Reid, Executive Director of the J.F. Maddox Foundation: "It's the curriculum, stupid…without good content, you have nothing" (¶14).

Uncorrected Errors and Obscure Authorship

On several occasions, a publisher was informed of serious errors, promised to make changes, gave false information about approval processes, and failed to make the promised corrections (McClintick, 2000). In another case, an author delivered a book with accurate content, and then in the editing process, the publisher made changes that created serious errors and failed to check the changes with the author before publishing it for distribution and sale (McClintick, 2000).

Regarding authorship, Sewell pointed out that "'elhi' authors have minimal control over their product;" even when authors are named, cost-cutting measures often lead to "nominal authorship," and lists of contributors to content may mean very little (2004, p. 31). For example, the National Geographic Society's logo appeared on one book in which the society's actual contribution was very small (Sewell, 2000, p. 10). Thus, it is not safe to make assumptions about the quality of content, based solely on the names of authors.

Incoherent Narrative

Mechanical and fragmented overuse of readability formulas, blind to both sense and style, have resulted in the removal of important content and abridged narrative with choppy, bite-sized units of prose. The efforts to make word and sentence length fit a particular formula have frequently produced materials that are actually harder, not easier, for students to understand (American Textbook Council, 1988; Harniss, Hollenback, Crawford, & Carnine, 1994; Kinder, Bursuck, & Epstein, 1992; Ornstein, 1992; Osborne, Jones, & Stein, 1985; Tyson, n.d.; Watt, 1991; Young & Reigeluth, 1988).

Superficial Evidence of Content Coverage

Some materials replace coverage and depth of detail with chapter titles, topic headings, required terminology, entries in the index and glossary, photographs with a single word or image related to a topic, or a lengthy passage (Tyson, n.d.).

Misrepresentation of Minorities and Cultures

In an earlier report by Wade (1993), almost all the researchers (88%) concluded that the texts avoided the controversial aspects of this subject (56%) and presented biased or stereotypical information (40%). Biases occur in the portrayal of social, cultural, and gender diversity with persistent "decontextualized cultural factoids rather than strategies for identifying and understanding cultural differences." Inaccuracies, omissions, and distortions in the representation of minorities continue (Siegel, Sousa, & Boling, 1994; Miles cited in Barker & Matveeva, 2006; Watt, 1991; Watts-Taffe, 2005).

Culture and Diversity

Some positive trends have been identified in the examination of culture, but subtle cultural biases also linger. Books may omit related real problems of diversity of great community or national interest; instructional materials tend to contain "peripheral treatment of diverse groups" in lieu of true integration of diverse perspectives (DeVoss, Jasken & Hayden cited in Barker & Matveeva, 2006, p. 192; Young & Reigeluth, 1988; Zittleman & Sadker, 2002; Ornstein, 1992; Watt, 1991; Sewell, 2003, 2005).

Watts-Taffe (2005) recommend two ways to rectify this situation: Include items related to respect for diversity in evaluation protocols, and build respect for diversity into frameworks and standards and in any bid specifications for publishers (pp 8-11).

Examples of more responsible approaches to encouraging learning about diversity include:

- Activities that encourage exposure to cultural differences
- discussion of models and theories
- realistic examples and exercises that demand reflection
- guidelines and principles for examining intercultural diversity

(Barker and Matveeva, 2006, p. 194).

Gender

In 2007, Hahn, Bernard-Powers, Crocco, and Woyshner (cited in Blumberg, 2007) found there had been progress in reducing the "worst examples of sexism" in social studies textbooks, but there was otherwise "remarkably little empirical evidence" of gender equity (p. 19). In over 30 years of publishing, treatment of gender has improved only modestly in U.S. high-school history textbooks (Clark, Allard, and Mahoney cited in Blumberg, 2007). Subtle gender biases linger (Young & Reigeluth, 1988; Zittleman & Sadker, 2002).

Management of Reviews

In addition to balancing the appeals of marketing and the lure of saving money, evaluation committees face the perplexing and difficult task of managing the time for thoughtful review. Reviewers often must race through multiple rating criteria, which they apply to each set of materials they rate (Loewen, 1995). Even the best checklist may become useless under extreme time constraints. For example, suppose a committee of 10 were given 25 instructional materials and asked to rate each using 16 criteria on a scale of 1 to 5. If the committee were given seven hours to do the job, then about 16 minutes could be spent on each set of materials with only one minute spent on assessing each of the criteria (Tyson, n.d.). In this example, it would take at least five days to devote only five minutes to each of the criteria.

The lack of time for thoroughly reviewing the major text or program and ancillary materials can lead to the use of the *rule of thumb test*, which means that before any other considerations, materials first have to pass the attractiveness test for color, organization, and overall presentation (Oliveira, 1995). A reviewer quickly fans through pages or scans through computer screens, gives a cursory glance at the table of contents or menu, or scans material in other ways (Armstrong, Davis, Odden, & Gallagher, 1989).

Even when reviewers have an excellent checklist and adequate time to evaluate materials, the value of the exercise is nullified if reviewers lack the training that provides a common understanding of the items on the checklist (Tyson, n.d.). Watts-Taffe (2005) suggests that two ways to combat a lack of training is to consider maintaining continuity from one adoption cycle to the next and to provide some type of reward or payment for committee service.[2]

Efficient, effective evaluation requires a plan for both time management and the thorough review of materials. Research reports suggest the following strategies to strengthen the evaluation process:

- evaluate all components
- use the strengths of committee members
- divide criteria among members
- identify important content
- look for content of information

2. The importance of continuity has been one that Florida encourages, but the mix of schedule and workloads sometimes does not allow the full richness of continuity that would be ideal. This is a challenge one would expect with or without release time or pay. However, Florida recognizes and supports this kind of continuity.

- review from the student's perspective
- review from the teacher's perspective
- defend judgments and conclusions.

Strategies for Evaluating Materials

Evaluate all components

It is important to assess each component of an "instructional package" separately. In other words, the criteria should be used to thoroughly assess workbooks, activity sheets, pre- and post-tests, videos, films, computer software, and posters, as well as textbooks. Ideally, all components will meet all criteria. It also may be helpful to provide committee members with specific examples for each criterion, discussing both good and bad examples, and provide time for practice with the evaluation tools (Watts-Taffe, 2005, pp. 8–11).

Use the strengths of committee members

Compose evaluation committees to include diverse perspectives, which are representative of the diversity in the community, subject-specific knowledge, and pedagogical knowledge (Watts-Taffe, 2005, pp. 8–11). While all members should review all components, some members will be more qualified to focus on particular issues. For example, some members may be better qualified to focus on diversity or classroom management and others on quality of test materials or vocabulary. Drawing upon such strengths becomes especially valuable, regardless of whether committee members must reach consensus or discuss their "independent reviews" before voting *for* or *against* adoption of instructional materials.

Divide criteria among members

In this approach, each member looks at all the components, but focuses on one or two of the major criteria categories. For example, one or two members might focus on **CONTENT** in all of the student and teacher materials, while another one or two focus on **PRESENTATION**, and still others focus on **LEARNING** strategies and activities.

This approach can be used even during independent reviews as a personal work-management plan. It serves as a structure for organizing the review tasks (i.e., begin with reviewing and making notes on **CONTENT** across all components, then evaluate **PRESENTATION**, and so on). Dividing the criteria in this way helps members manage their time while focusing their attention on specific issues. Then, when the committee meets as a group, individuals can share their findings, and the group can discuss the merits in each area (Young & Reigeluth, 1988).

Identify important content

Determine which topics are most important and which must undergo thorough review. Evaluators might be asked to outline a particular chapter in each book—a good check against poor organization and incoherence (Tyson, n.d.). Evaluators might take a random sample of 20 topics from the list of important content and look for completeness of coverage, approaches to content,

and inclusion of skills such as problem solving or critical thinking (Young & Reigeluth, 1988). At the same time, evaluators may notice topics that appear in the materials, but are not important or relevant. These findings, too, affect the overall evaluation.

Look for context of information

Context is crucial to both understanding and remembering. The overall organization of books and chapters, quality of writing, relevance of graphics, nature of questions, and dozens of other features have been shown either to support or obstruct comprehension. The types of questions used in learning activities provide clues about the learning outcomes that can be achieved. Recently, there has been only a meager increase in the number of *actual* higher order or thinking questions, but a large increase in the number of questions *labeled* as higher order or thinking questions (Tyson, n.d.).

Review from the student's perspective

When evaluators judge materials on the basis of whether students would actually enjoy and find meaning in them, publishers try harder to make the text or narrative of the material clear and interesting to students. Evaluators should ask themselves the following types of questions:

- *Would a student voluntarily read this book or go through this program?*
- *If a student missed class, could (the student) reasonably be expected to learn the missed material by reading the book or by completing the computer program or other media activities?*

Not too difficult or too easy. Selection committees should exercise caution when choosing between materials that are too difficult and those that are too easy. Materials that are too easy may bore students. If materials are too difficult, students struggle to learn the content. It is important to consider students' vocabulary and knowledge limitations and to look for explicit writing that is oriented to student activity or performance, rather than simply to topics (Montague & Knirk, n.d.).

It also is important to look for effective instructional strategies for different types of students. Popular approaches may not be the most effective (Carnine, n.d.).

In addition to thinking about the student's perspective, teachers sometimes ask students to study a chapter or work through part of the materials and solicit their reactions (Tyson, n.d.). At other times, materials may already have been pilot-tested or implemented in some classrooms, and information about results may have been provided with the publisher's submission, or may be available directly from the schools.

Review from the teacher's perspective

Teachers may want certain features to match their different teaching styles. Mastery learning, discovery learning, and direct instruction require different types of activities and organization of content (Young & Reigeluth, 1988).

Sometimes materials contain a variety of activities to match various teaching styles. However, it is generally unrealistic to expect any single set of materials to provide a solid match to all styles. It is more important to look for materials that provide content drawn from valid and reliable

scholarship, arranged in a manner amenable to reshaping by the teacher to fit the needs of the class and individual students (Talmadge, 1986).

Defend judgments and conclusions

The judgments and conclusions of evaluators result in decisions that affect the learning of students, the workload of teachers, the costs to the school system, and the decisions of publishers about materials that they will develop and submit in the future. These judgments and decisions receive close scrutiny. Therefore, it is especially important that evaluators *report* judgments and decisions on the basis of the criteria provided for selection and that they *defend* their judgments and conclusions in writing and discussions (Young & Reigeluth, 1988; Tyson, n.d.).

To make the materials more defensible, Watts-Taffe (2005) suggests that states should invest time and resources in the careful design of selection procedures and include diverse voices in the process. Within this design, allow adequate time for each phase of the process and include a plan for regular, periodic review of the effectiveness of the process.[3] In addition, they suggest developing systematic methods of collecting public opinion and piloting textbooks under consideration.

Finally, it will be useful for evaluators to make notes about their findings during each stage of their review. Then after the review, it will be easier to *summarize key points* in the comments section of an evaluation form or report.

3. The underlying reasons for this recommendation deserve particular attention because of their relationships to the intensity of pressure groups when gathering public responses to textbooks under consideration, namely, the loudest voices often have the greatest influence, even if not representative of the whole community. To quote Watts-Taffe, "Therefore, it is important to seek public opinion in ways that ensure representation from *all* constituencies" (2005, p. 11). In addition, the focus on NCLB requires greater attention to evidence of success.

Major Priority Areas for Evaluation: Introduction

Based on extensive research, Florida has identified three priorities for the evaluation of instructional materials. These priorities are content, presentation, and learning.

- **Content** is the top priority. Without good content, classy presentation and engaging constructivist learning activities will lead to wrong learning.
- **Presentation** is not just the "look" of materials, but how well the materials fit together, their organization, readability, pacing and ease of use. Being unable to use or make sense of the materials would make them impractical, even with good content. Students may be initially attracted to a package that looks good, but will be more engaged by readable, well-organized materials, with pacing that makes sense for what they are learning.
- **Learning** strategies and companion assessments within instructional materials, must be examined for their fit with the content, the objectives, and the learners. While good teachers can make up for poor strategies, strategies that lead students in the wrong direction will not work. Many materials have promised coverage of higher-level learning, but close examination shows that they have targeted only low-level recall of verbal information/knowledge. The strategies may not even reach the comprehension level of objectives, just the recall.

The following sections represent an update of the research for each of the major priority areas.

Priority Area: Content

Content review includes: alignment with curriculum, level of treatment, expertise of authorship, accuracy, currentness, authenticity, multicultural representation, and portrayal of humanity and compassion.

The content must be accurate, current, and comply with Florida laws. Florida's tool for reviewing the priorities has eight criteria categories, each of which has a particular description that can be found in Appendix A.

The publisher submission will identify what course is intended as a match for the submission of the evaluation sets of sample materials. Committee members must compare the adequacy of the alignment of the publisher's submission to the course content requirements.

Examining the correlations data is just the beginning. Making individual judgments by comparing the content in the major tool and its ancillary materials requires analysis beyond the correlation charts and the publisher's description of what has been covered. Although the content may be accurate and complete, it also needs to match the course objectives or student developmental levels.

Some features of content coverage have received progressively more attention over the years. The following sections describe the content features expected for each of the content review areas outlined above.

Alignment with Curriculum Requirements

Content must align with the state's standards and benchmarks for the subject area.

Alignment is reflected in

- correlations of content with curriculum requirements,
- scope of content, and
- completeness for use in instruction.

Correlations

Content alignment refers to the match between the materials and the curriculum framework developed by the state (Armstrong, Davis, Odden & Gallagher, 1989, p. 10). Publishers are expected to provide correlation charts to show exactly where and to what extent (mentioned or in-depth) the instructional materials cover the Sunshine State Standards and benchmarks outlined in the course descriptions.

Scope

The content should address Florida's required curriculum standards for the subject, grade level, and learning outcomes, including thinking and learning skills. Florida's standards incorporate skills such as critical thinking, problem-solving, creativity, innovation, collaboration, and communication. Effective materials stretch the student's mind and facilitate learning how to learn (Florida Department of Education, Sunshine State Standards; Harniss, Hollenbeck, Crawford, & Carnine, 1994; Ornstein, 1992).

Completeness

The content of the major text or program should be complete enough to stand on its own, useful for classroom instruction, adaptable to the required goals and course outlines, and align with the state standards. Materials should have no major omissions in the required content. Content should be free of unrelated facts and information that would detract from achievement of Florida's specified Course Descriptions and Next Generation Sunshine State Standards.

Level of Treatment

The level of complexity or difficulty of content must be appropriate.

Level of treatment depends on

- objectives,
- students, and
- time.

Objectives

Content should be simple, complex, technical, or non-technical enough for the intended target learners and sufficient to meet objectives. Often, however, materials contain overwhelming encyclopedic content that may provide a "match" to the standards, but exclude content that is "thought-provoking." This inclusion of dense factual information pushes aside concepts, context, explanations, examples, strategic and higher-level thinking, critical analysis, and evaluation. In addition, many books contain disconnected facts that fail to educate or motivate the students (Harniss, Hollenback, Crawford, & Carnine, 1994; Ornstein, 1992; Ravitch, 2004; Sewell, 2004, 2005; Nelson cited in Jehlen, 2000, p. 1).

Students

All of the events of teaching and learning occur within a context of the audience (students and teachers) and instructional analysis of objectives (content and levels of learning) so that appropriate instructional and assessment strategies are integrated into the whole of the instruction. For example, the language level of the text should not interfere with student comprehension (Wade, 1993).

Content should be presented in ways that match the age and maturity level of the intended students. It should contain sufficient details for students to understand the significance of the information presented and engage in reflection and discussion.

Time

In addition, the level of complexity or difficulty of content should allow for its coverage during the time periods available for teaching the subject.

Expertise for Content Development

Expertise in the content area and in education of the intended students must be reflected in the authors, reviewers, and sources that contributed to the development of the materials.

Expertise depends on actual quality of

- authorship and
- sources.

Authorship

The following questions need to be considered concerning authorship of materials: Who are the authors? What are their credentials? Are they responsible professionals? Are they anonymous, or, is their only contribution allowing their name to be used on the cover of the book (Guth, 1989; Sewell, 2004)? Did they actually make substantial contributions?

A few examples of problems include:

- Some publications have "nominal authorship" in which listed contributors did little to develop content (Sewell, 2004, p. 31). For example, the National Geographic Society's logo appeared on one book in which the society's actual contribution was very small (Sewell, 2000, p. 10).
- The author may have little control of the book once it is in the hands of the publisher. For example, on several occasions, a publisher was informed of serious errors, promised to make changes, gave false information about approval processes, and failed to make the promised corrections (McClintick, 2000).
- The author may not be included in editing the book. In one case, an author delivered a book with accurate content, and then in the editing process, the publisher made changes that created serious errors and failed to check the changes with the author before publishing it for distribution and sale (McClintick, 2000).

Sources

Primary and secondary sources should reflect expert information for the subject, such as relevant data from research, court decisions, diaries, autobiographies, artifacts, or historical sites. The type

of sources considered appropriate will vary with the particular subject area. In general, however, better materials will reflect a scholarly approach to the development of content.

Accuracy of Content

Content must be accurate in historical context and contemporary facts and concepts.

Content accuracy depends on

- objectivity,
- representativeness, and
- correctness in historical and contemporary representation.

Objectivity

Content that is included in the materials should accurately represent the domain of knowledge and events and avoid factual errors (Exline, 1989; Ornstein, 1992). It should be factual and objective, and free of mistakes, errors, inconsistencies, contradictions within itself, biases of interpretation, and biased selection of information.

Materials should distinguish between facts and possible interpretations or opinions expressed about factual information. Visuals or other elements of instruction should contribute to the accuracy of text or narrative.

Representativeness

Content should be both historically accurate and in step with accepted contemporary facts and concepts. The selection of content should not misrepresent the domain of knowledge and events. It should include the generally accepted and prevalent theories, major concepts, laws, standards, and models used within the discipline of the subject area (Exline, 1989; Ornstein, 1992; Miller, 1971).

Correctness

Materials often do not give topics the treatment they deserve, contain factual errors, or persist in presenting disproven concepts.

A few examples of errors include:

- giving wrong dates for Germany's occupation of the Rhineland and [for] the Emancipation Proclamation
- reporting that freed slaves were denied marital and other rights in the Black Codes, which in fact granted those rights and
- including a statement that the Earth rotates around the moon

(Wade, 1993; Ornstein, 1991, 1992; Watt, 1991; Young and Reigeluth, 1988; Goldstein, 2001; McFarlane, 2001; Miller, 1992; Mestre, 2001; Putka, 1992; Schaeffer, 2004; Sewell, 2004; The Fordham Institute, 2004).

Currentness of Content

Content must be up-to-date for the academic discipline and the context in which the content is presented.

Currentness of content depends on

- dates or editions and
- context.

Dates or Editions

Copyright dates for photographs and other materials provide one source of information about currentness. The edition is another indicator. However, neither the copyright date nor the edition guarantees currentness of content. In fact, second or third editions may or may not reflect more up-to-date information than first editions.

Context

Informed examination of the text, narrative, and visuals contained in the materials provides the most direct information about currentness of the materials.

Text or narrative, visuals, photographs, and other features should reflect the time periods appropriate for the objectives and the intended learners. Information should reflect current knowledge within the discipline. For example, scientific information, new discoveries, or approaches should be up-to-date and reflect emerging information, technology, or trends. Historical content should be relevant.

A few examples include:

- Sometimes, context should be current. For example, a photograph used to show stages of human growth and development will be more relevant when the clothing, hairstyles, and activities reflect present-day realities.
- Sometimes, context should be historical. For example, illustrations and photographs of historical events should reflect the historical time period.
- Sometimes, context should be both current and historical. For example, historic images alongside modern ones would convey changes in styles over time.
- At all times the context should be relevant to the learners, to the Standards and Benchmarks or Curriculum Frameworks, and to the concept presented.

Authenticity of Content

Content should include problem-centered connections to life in a context that is meaningful to students.

Authenticity depends on

- life connections and
- interdisciplinary treatment.

Life Connections

Content meaningful to the students is critical and, for this reason, materials should connect learning with real-life situations, provide a meaningful context for tasks, and include problem-centered instruction (Crowl, Kaminsky, & Podell, 1997; Huot, 1997; Kauchak & Eggen, 1998; Maryland State Department of Education [Maryland DOE], 1990; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; McREL, 1997; Willis, 1992; Wood, 1996; Watt, 1991; Smith & Ragan, 1993; Tyson, n.d.).

Real-life relevance is one of the fundamental requirements for motivating and sustaining attention. It is insufficient to reflect this in visuals; it must also be within the text. Instructional materials should include connections to the students' life situations to make the content meaningful. Students might be expected to deal with time constraints, consider risks and trade-offs in decision-making, and work with teams. Connections may be made to situations of daily home life, careers, vocation, community events and services, and leisure or recreation.

The learning situation should involve systematic experiences in a range of conditions that move toward developing a context similar to that in which the skills and knowledge will be applied. This approach results in durable, adaptable, and substantial learning. Systematically planned, monitored, and repeated, real-world testing and rehearsal of critical skills also are required for maintaining those skills (Montague & Knirk, n.d., 1 of 14).

Interdisciplinary Treatment

Learning improves when materials structure information in an interdisciplinary fashion, including explanations and practice activities for transferring skills and knowledge from one subject area to another.

Examples of approaches to interdisciplinary connections include:

- explanations and activities for using skills and knowledge from other academic disciplines
- assignments that require students to relate learning from other disciplines rather than to isolate knowledge or skills
- a focus on common themes across several subject areas (infusion, parallel, trans-disciplinary, or multidisciplinary instruction)

(Exline, 1989; Marzano, et al., 1988; Maryland State DOE, 1990).

Multicultural Representation

Portrayal of gender, ethnicity, age, work situations, and various social groups must include multicultural fairness and advocacy.

Multicultural representation has two dimensions, which are

- fairness and
- advocacy.

Multicultural Fairness

Fairness requires a balanced representation of cultures and groups. The materials should support equal opportunity without regard for age, gender, disability, national origin, race, or religion, and should represent multiple settings, occupations, careers, and lifestyles. Examples of responsible approaches to encouraging learning about diversity include:

- activities that encourage exposure to cultural differences
- discussion of models and theories
- realistic examples and exercises that demand reflection
- guidelines and principles for examining intercultural diversity

(Barker and Matveeva, 2006, p. 194).

Florida law is very specific about those social and/or controversial issues that must be included in public-school instruction. These include African-American history, the Holocaust, health, conservation of natural resources, kindness to animals, and other issues.

Materials should impart an understanding of concepts such as prejudice, discrimination, and social responsibility in common terms for different cultural groups. Materials should exclude biases, stereotyping, and inaccuracies about gender, ethnic groups, and cultures, and express acceptance and value of different perspectives (Exline, 1989; Kauchak & Eggen, 1998; Ornstein, 1992; Watt, 1991).

An important part of cultural fairness in instructional materials involves gender equity. Evaluations should include analysis of: (1) How many women are shown in the chapter? (2) What kinds of jobs are shown being performed by women? What kind by men? (3) If a difference is found, how do you account for this difference? (4) What might this information tell you about the biases of the textbook writers? (5) What types of problems does this information raise?

Detecting bias. Blatant biases are easy to detect; however, subtle biases and peripheral inaccurate treatment of multicultural representation may be much harder to detect. Avoidance of authentic cultural differences affecting politics, civil, and international relationships is not an indicator of multicultural fairness and advocacy.

Multicultural Advocacy

Advocacy requires embracing a multicultural context, not just through pictures, but through information about ways to honor differences and deal with conflicts, promote a positive self-image for members of all groups, and provide for the development of healthy attitudes and values. Portrayals must promote an understanding and appreciation of the importance and contributions of diverse cultures and heritage.

Watts-Taffe (2005) reports that respect for diversity deserves serious analysis (p. 1), stating that education is the balm for "social cohesion" (p. 8). Regarding this complex issue, it is just as important to look for what is *missing*, as well as what is present in the instructional materials.

Multicultural treatment must accommodate age and ability levels of the students in how they honor real differences, deal with conflicts, project positive self-images for members of all groups, and develop healthy and productive attitudes and values.

Humanity and Compassion

Portrayal of the appropriate care and treatment of people and animals must include compassion, sympathy, and consideration of their needs and values and exclude hard-core pornography and inhumane treatment.

Humanity and compassion addresses

- inclusion of compassion and
- exclusion of inhumanity.

Context is important when evaluating the inclusion of compassion and exclusion of humanity, including the age and abilities of the students. To avoid criticism, some publishers avoid historical, national, and international events related to the learning objectives for a course. Such avoidance, however, expresses neither inclusion of compassion, nor exclusion of inhumanity.

Sewell (2005) and Monroe (2007) found that publishers cave in to pressure from peripheral single-interest groups, and the result produces shallow content. "Many political and religious groups try to use the textbook process to their advantage" (Sewell 2008, p.5). As an example, Sewell commented on the uneven treatment of Islam across textbooks: "Islamic achievements are reported with robust enthusiasm, but when any dark side surfaces, textbooks run and hide." Textbooks often present Islam's past "exclusively through the lens of 'tolerance' and 'equality'" (p. 18). This kind of skewed treatment is pervasive, and leaves significant questions unanswered. The inclusion of humanity and the exclusion of inhumanity should not lead to the exclusion of critical information required by students to analyze important questions about complex issues.

Inclusion of Compassion

In narrative or visual examples, materials sometimes depict the care and treatment of people and animals. Generally, this means showing in some way a measure of compassion, sympathy, or consideration of their needs and feelings.

Exclusion of Inhumanity

In the context of personal and family values, Florida expressly prohibits material containing *hard-core pornography* [F.S. 1006.34(2)]. In addition, although the definition of *inhumane treatment* can sometimes appear to be controversial, as in science research, there is general agreement that instructional materials should not advocate any form of inhumane treatment.

Priority Area: Presentation

Presentation review includes teacher and student resources, and alignment of instructional components, organization, readability, pacing, and ease of use.

A major part of presentation concerns how well the student and teacher resources work together. The teacher's manual should align with students' activities in the content, sequence, pacing, and procedures for teachers, and should be of high quality.

Presentation features for attractiveness and durability are not generally among the flaws of instructional materials. For example, history books often have photography, graphics, and maps that are "eye-catching," "highly pictorial," "evocative," and "gorgeous" (Sewell, 2000, pp. 5-6). This facet of presentation is so well accomplished by publishers that reviewers are tempted to "judge a book by its cover," rather than its content.

Research gives important guidance on how to judge other features of presentation, such as elements that make instructional materials "readable" for students. This means not relying on a readability formula, just as one cannot rely on a measuring tape around someone's waist to judge the health or full size of a person. Similarly, the actual flow of words, organization of ideas, and logical connections it makes can change the interpretation of a readability score.

Visuals also play a role in readability. Too many visuals can distract learners from the learning process. But relevant visuals support readability when integrated with text in a form different, but explanative, of the content. Such visuals also should cover the same territory; that is, if the text emphasizes cause-and-effect relationships, then the visuals would show this relationship, too.

Finally, pacing and ease of use concern the organization in modules, units, or volumes as well as practicality for use in actual classroom instruction.

Comprehensiveness of Student and Teacher Resources

Resources must be complete enough to address the targeted learning outcomes without requiring the teacher to prepare additional teaching materials for the course.

These include

- student resources and
- teacher resources.

Student Resources

Although flashy, eye-catching materials with easy-to-read lists and colorful illustrations may be attractive, students often consider them dull reading, especially when the materials provide

oversimplified tidbits of information without integration of subject matter (Holliday, 1990; Loewen, 1995; Ornstein, 1992).

Attractive features can be misleading. Another danger is that those attractive features used to highlight key ideas often mislead students (Sewell, 2005). For example, elementary-, middle-, and high-school science and math textbooks contain random, unrelated topics and facts with boldface type for so-called "main ideas." But the "main ideas" are only definitions and facts, not actually ideas. In addition, there is a failure to highlight the few conceptual explanations that are provided, and the questions in the materials are often "what" rather than "why" questions, which emphasize recall, not thinking or application (Mestre, 2001, pp. 8-9).

Reference aids. Effective instructional materials generally integrate the use of reference aids (e.g., index, glossary, maps, bibliography, graphic organizers, and pictures) with the topic being studied. Items that guide students through materials might include clearly labeled materials, directions and explanations, assignments with menus of choices, enrichment and remediation activities, additional resources, and tests and assessment tools either in the student materials or in the teacher's guide or edition.

Teacher Resources

Resources for teachers often include a massive teacher's manual that includes the annotated student text, lesson plans, enrichment activities, questioning strategies, tips for varying learning styles, support for special needs, instructions on how to use the book, bibliographies, copies of ancillary written materials with answer keys, worksheets, tests, and diagrams, etc. These resources can be so comprehensive that nearly all instructional decisions are made for the teacher, and it becomes especially important to evaluate the quality and implications of those decisions, particularly for teachers who may be teaching a subject for the first time (Ajayi, 2005, pp. 203, 208).

Posters, transparencies, maps, audio and video tapes, lab manuals, CDs, DVDs, kits for laboratory experiments, student practice materials, test items or test books, study guides, summaries, review questions, media supplements, parent letters, and other teaching aids also are often provided (Ajayi, 2005; Risner, Nicholson, & Webb, 2000).

Components and materials that are easy to use. This aspect is very important and includes features that contribute to practicality, such as clear layout and durability over time. Other examples that make materials practical, or easy to use, include clearance, license, or agreement for copying and use of materials; clear description and accurate directions for use of required equipment, facilities, resources, and environment; clearly labeled grade, lesson, content, and other information to identify components; correct specifications for making media and electronic programs work effectively.

Materials to support lesson planning, teaching, and learning. The manual should have enough content to give teachers more time to prepare lessons (Ornstein, 1992) and provide guidance on teaching procedures. Other support might include cultural aspects, a plan for each lesson, enough information about topics and answers, information about what parts students may find difficult, ways to explain difficult parts, information on how students learn the subject, and/or reasons for

using certain activities, classroom-management tools such as outlines for planning and organizing courses, units, and lessons, and ways for teachers to become more confident with their teaching skills.

Suggestions for adapting instruction for varying needs. Features that support adapting instruction include approaches that may work for different styles of learning or a variety of activities or plans for large and small groups, and explanations of what may work in different learner contexts. Examples include alternative approaches to teaching, pacing, and options for varied delivery of instruction such as media, tools, equipment, and emerging technology; strategies for engaging all students, such as open-ended questions to stimulate thinking, journals, manipulatives, explorations, and multi-sensory approaches; suggestions for addressing common student difficulties or adapting to multiple learning styles; and alternative re-teaching, enrichment, and remediation strategies (Joyce, Weil, & Calhoun, 2004; Gleason, 2001).

Guidelines and resources on how to implement and evaluate instruction. Examples include answers to work assignments, practice activities, and tests; possible outcomes of projects or research; suggestions for using learning tasks for classroom assessment; guidelines for alternative assessments, such as sample checklists, peer or performance assessments, portfolios, or projects.

Resources to use in classroom activities. Examples include copy masters for displays or photocopies; bibliography or list of resources and references, including network resources; classroom management strategies and documentation on the manageability of the entire instructional package; in-service workshop or consultation support from the publisher.

Resources for building relationships with families. For some schools or selected content, building relationships between families and professionals may be particularly important. This is one area that has *not* been explicitly addressed in Florida's criteria for evaluation of the major priority areas, but might be added by the evaluation committee if it is particularly important to a course. Haring and Arnold (2001) wrote of the importance of providing teachers with information that helps them build such partnerships, including legal and ethical issues. This is especially important when it includes issues such as:

- ethical questions across the lifespan
- how family development is affected when a child has disabilities
- information and resources to support the family and to help in making choices, especially during transitions
- clear, positive, and constructive strategies for communication and ways to conduct effective conferences (pp. 164-165).

Examples of other helpful teacher resources include:

- an overview of components and objectives
- background for lectures and discussions
- technical terminology, and reinforcement and review strategies

- scope-and-sequence chart for activities and planning
- sample lesson plans
- suggestions for individualized study, small-group and large-group presentations and discussions, school-to-work activities, field or laboratory experiences, and other extension activities
- suggestions for integrating themes across the subject area or course curriculum and forming connections to other disciplines
- suggestions for parental and community involvement
- cultural highlights to explain and expand.

All components of an instructional package—teacher's edition and materials, students' edition and materials, workbook, ancillary materials, and others—must be integrated and interdependent and must correspond with each other. For example, master copies of handouts in a teacher's edition should align with student activities or assignments. They must match in content and progression of instructional activities.

Alignment of Instructional Components

All components of an instructional package must align with each other, as well as with the curriculum.

Alignment of instructional components refers to alignment

- within student materials and
- with teacher materials.

Alignment within Student Materials

Alignment of content, learning activities, tests, goals, and objectives improves learning. Clear alignment of learning goals, objectives, content, activities, and assessments contributes to the development of higher-order thinking skills (Crowl, Kaminsky, & Podell, 1997; Exline, 1989; Kameenui, 1991; Montague & Knirk, n.d.; Oliveira, 1995; Kauchak & Eggen, 1998).

Alignment within Teacher Materials

Ajayi (2005, p. 209) emphasized the importance of alignment of a teacher's manual with students' activities of the content, sequence, pacing, and procedures for teachers, and at the same time, advocated for the manuals to shift more responsibilities over to the teachers. Gearing (1998) included features such as deciding how important the elements of a manual are to the teaching process and then whether they are of high quality. Examples included ease of understanding, amount and type of advice and information on topics, organization of lesson plans, durability, and practicality.

Materials must match in content and progression of instructional activities.

Organization of Instructional Materials

The structure and format of materials must have enough order and clarity to allow students and teachers to access content and explicitly identify ideas and sequences.

Clear organization of instructional materials supports

- access to content,
- a visible structure and format, and
- a logical organization of content and activities.

Access to Content

Some features help in searching and locating information, such as a table of contents; 6-12 content scope and sequence chart, menu, or map of content; directions on how to locate information or complete assignments; an index for quick reference; goals and/or objectives, outlines, lists, or checklists for major sections; bibliographies and lists of resources; glossaries for quick access to major terms; introductions, key concepts, and themes; visual cues, illustrations, labeled examples, and labeled reviews or summaries.

Visible Structure and Format

Placement of information can help students and teachers see structure (Hartley, 1996, p. 922); thereby, supporting *organization, readability*, and *pacing* of content. In one study, Crawford and Carnine (n.d.) reported better learning with conceptual rather than topical organization of a textbook. Together with visuals, typographical design helps reading rate and comprehension, whether on a page or screen.

Visual cues signal content and organization. *Examples include:*

- font style (*e.g.,* Times New Roman, Arial) and treatment (regular, italics, bold, larger, smaller) to signal importance or type of content;
- symbols to concentrate attention; numbering schemes, and other ways to "showcase" headings;
- subheadings, summaries, overviews, outlines, and section;
- color and highlighting (or shading) to add emphasis, attractiveness, or show types of information; bright colors to highlight small areas; and
- margin comments, textboxes, tables, and charts

(Mayer cited in Kuzu, Akbulut, & Sahin, 2007 ¶20; Hartley, 1996; Erdogan, 2008; Hartley, 1996; Hill, Hartley, 1996).

Layout organizes content with sensible groupings and consistent structure. *Examples include*:

- close proximity of related text, numbers, and graphics;
- organized lists of learning objectives, chapter outlines, questions to signal discussions or

reflections, section and chapter summaries, review exercises and test structures, glossaries, any inter-textual references, and text-to-graphic references;

- headings and page numbers placed consistently to make it easier for readers to find this kind of information;
- simple designs to show complex issues and use of comparisons, contrasts, tables or graphics to simplify complex data or comparisons; and
- objectives, questions, bold, and italics

(Gales, 1999; Hartley, 1996, p. 940; Marland & Store, 1982).

Objectives can aid content organization. Objectives or a content outline may introduce main ideas, provide guideposts to use in searching for key information, or serve as a checklist for self-assessment.

Clear objectives and instructions not only support readability, they also can reduce incidental learning, encourage students to search for relevant materials, improve learner confidence, and decrease learner anxiety. If placed at the end of instructional material, they can serve as assessment checklists (Marland & Store, 1982; Marland & Store, 1982; Montague & Knirk, n.d.; Smith & Ragan, 1993).

However, where text is highly structured, specific objectives have less of an impact on learning (Exline, 1989), due, perhaps, to students relying on presentation features such as bolded terms or lists of items under headings such as "main ideas." A recent study found that students were able to access the design features of different types of books to accomplish the targeted learning (Chambliss, Richardson, Torney-Purta, & Wilkenfield, 2007).

Chunking. Print and electronic materials in "bite-size" chunks or blocks of information help in learning new information (Crowl, Kaminsky, & Podell, 1997; Gagné, Briggs, & Wager, 1988; McPeck, 1990). *Examples include*:

- orientations, summaries, examples, diagrams, tables, flow charts, and other charts and visuals that summarize, condense, and compare important or difficult-to-learn information;
- organized information followed by questions or activities;
- outlines, lists, and indexes for easy access to content; and
- spacing, headings, indentation, and page layout to distinguish types of information

(Montague & Knirk, n.d.; Holliday, 1990; Smith & Ragan, 1990; West, Farmer & Wolf, 1991; Oliveira, 1995, 488; Crowl, Kaminsky, & Podell, 1997; Gagné, Briggs, & Wager, 1988).

Logical Organization

Students need organized knowledge structures to learn new information. Poor organization is detrimental to learning, while an explicit and teachable content structure can double the amount remembered. Examples of organized content structures include outlines of main ideas; advance

organizers with major questions, steps, or parts; concept or cognitive maps; and schemata for problem solving (Ausubel, 1963; Cotton, 1997; Crowl et al., 1997; Harniss, Hollenback, Crawford, & Carnine, 1994, p. 238).

Logical organization must be

- unified and
- consistent.

Unified

The statement of a clear purpose with content organized around main ideas, principles, concepts, and logical relationships supports the unity and flow of information. Introductions also play a major role when they include anchoring ideas, a list of key points, or conceptual schemes such as metaphors. Summaries also can assist students in understanding the logical order of topics presented.

Consistent

The pattern of organization of the content should be consistent and logical for the type of subject or topic. Patterns of organization may include compare and contrast; time sequence; cause-effect or problem-solution-effect; concrete-to-abstract; introduction-review-extension (spiral structure); simple-to-complex; whole-part or part-whole; generalization-examples-review-practice; and conflict-inside view-structure.

Structure with logical sequencing improves learning. Logical relationships, such as cause-and-effect or simple-to-complex skill learning, comparison-contrast, problem-solution, are better than simple topical order (Crowl, et al., 1997; Clarke, 1990; Briggs & Wager, 1988; Osborne, Jones, & Stein, 1985; Gagne, Briggs & Wager, 1988; Exline, 1989; Ornstein, 1992; Kauchak & Eggen, 1998; Williams, 1995; Martorella, 1982; Harniss, Hollenbeck, Crawford & Carnine, 1994; Young & Reigeluth, 1988).

Examples of effective organization include:

- broader organizational structures that span historical periods to show relationships among facts, concepts, and roles across history;
- simple listings when order is not significant;
- comparison-contrast for concepts;
- time sequence when timing of events is important;
- cause-and-effect to express cause or reason;
- problem-solution for reasoning or problem-solving skills; and
- the setting, characters, conflict, resolution, and inside view in a story

(Harniss, Hollenbeck, Crawford, & Carnine, 1994; Osborn, Jones, & Stein, 1985).

Spiral curriculum. A popular approach to sequencing also includes the spiral curriculum. In a spiral curriculum, materials return to previously covered topics in the context of new information with text or time placed between practice sets, usually increasing the complexity of content, tasks, and diversity of applications across successive intervals of time, teaching levels, units, or courses (Crowl, et al., 1997; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988).

Readability of Instructional Materials

Narrative and visual elements should engage students in reading or listening as well as in understanding the content at a level appropriate to the students' abilities.

Readability of instructional materials depends on

- language style,
- typographical presentation features, and
- visual features.

Language Style

Written or narrative styles, as well as visual features, can influence the readability of materials. Yet, one of the most popular tools for assessing readability has been *readability formulas,* which tend to focus only on a few *countable* characteristics of writing styles such as the length of words, sentences, and/or paragraphs. However, multiple features contribute to the flow of ideas. Not surprisingly, coherency is more important than bits of content coverage and numbers from readability formulas (Ornstein, 1992; Sewell, 2000; Watt, 1991).

Nonetheless, the readability formula has been considered by some as a make-or-break criterion for adoption, and for this reason, publishers often have written prose to fit a readability formula analysis. For formulas that measure "text comprehensibility," the *cloze procedure* gives better results than others. But the process of editing to *fit* a readability formula removes important content, uses inconsiderate language, abridges narrative with chopped-up, bite-sized units, and is harder for students to understand (Bormuth; Hater & Kane; Potter; Weintraub—all cited in Mikk, 2002, p. 126; American Textbook Council, 1988; Kinder, Bursuck, & Epstein, 1992; Harniss, Hollenback, Crawford, & Carnine, 1994; Tyson, n.d.; Wait, 1987; Young & Reigeluth, 1988; Ornstein, 1992; Watt, 1991).

In one perplexing study of text comprehension, students actually answered fewer questions correctly after reading the texts (Mikk, 2002, p. 135). In a report by Wade (1993), almost all the researchers (88%) concluded that the text was written in such a way that it interfered with student comprehension of the material (40%). In another study, students expressed preferences for narrative written from a teen's point of view, vocabulary they could understand, larger print, styled more like a magazine, and questions between smaller chunks of text (Lester & Cheek, 1998).

Features that interfere with readability. Although readability formulas may give the illusion of readability, actual reading of text or narrative will help determine if it is readable or if it actually contains features that *interfere* with readability. *Examples include:*

- *Fragmented content:* Fragmented, incoherent, and encyclopedic content interferes with readability. Readability deteriorates when texts introduce many new words at once (Watts-Taffe, 2005; Ediger, 2002; Turner & Kearsey, 1999).
- *Choppy sentences:* Superficial, short, and choppy sentences can distort the logical relationships of information, disrupt the presentation of ideas, and make it difficult to express the meaning of ideas (Osborn, Jones, & Stein, 1985; Ornstein, 1992).
- *Incoherent visuals:* Visuals unaligned with the content (fragmented), incoherent (make no sense with structure or meaning), or too complex (encyclopedic) will interfere with comprehension (Holliday, 1990; Kuzu, et al., 2007).

Typographical Presentation Features

The following are typographical features that support readability:

Font style forms and emphasizes words and ideas. *Examples include*:

- simple fonts, plain rather than italics, bold, or other styles in most of text;
- *serif* in printed documents except for emphasis;
- *type* large enough for the reader to easily see; and
- use of words with their normal upper and lower case letters, which allows students to recognize the characteristic shape of words

(Erdogan, 2008; Gales, 1999; Hartley, 1996; Hill, 1997; Royal National Institute for the Blind, 2008).

Text spacing separates and groups words, sentences, paragraphs, and sections. *Examples include:*

- normal spacing between words and unjustified paragraphs for most instructional text (except when emphasizing certain information); text justified on both left and right is harder to read because it makes uneven spaces between words;
- fonts with proportional spacing are easier to read;
- left justification and unjustified on right produces 10 percent savings in reading time; "white space" shows divisions between ideas and paragraphs; and
- enough space between columns clearly separates content

(Erdogan, 2008; Gales, 1999; Hartley, 1996; Hill, 1997; Royal National Institute for the Blind, 2008).

Simplicity avoids extraneous and redundant information and focuses attention. *Examples include:*

- avoidance of "unneeded colors and details;"
- use of color for specific purposes;
- symmetry, simple lines; and

- plain shading such as gray, solid pastel, or black

(Mayer cited in Kuzu, et al., ¶20; Erdogan, 2008; Gales, 1999; Hartley, 1996; Hill, 1997).

High, but not sharp, contrast supports separation of letters, words, and sections. *Examples include:*

- avoiding sharp contrast and glare to improve reading (e.g., avoiding glossy paper or extreme differences in font and background colors); and
- avoiding sharp contrast because light letters over very dark colors appear to glow and blur

(Royal National Institute for the Blind, 2008; Erdogan, 2008; Hartley, 1996; Hill, 1997).

Text and visuals focus information and concepts. *Examples include:*

- legible labels with names attached directly to parts; small messages and labels, still easy to read, placed next to data;
- simple explanations, important but not extraneous detail, and transitions and words to show logical connections between ideas

(Erdogan, 2008; Gales, 1999; Hartley, 1996; Hill, 1997).

Readability in electronic and Web-based materials. Readability in electronic and Web-based materials depends upon the same qualities required for comprehension in text, but material must be organized in chunks with nodes and links that make sense. In addition, on a Web page or screen display, the total page must be legible, letters and shapes must be visible, and the meaning of letters, words, and objects must be recognizable.

Web pages and display screens require more graphic forms and devices such as shading and boxes to present information. Readability and usability improve with overall layout, ease of access, ease of navigation, organizers, menus, icons, on-screen prompts, maps or schemata, and help indexes (Dunlap, 1998; McFarlane, 2001). Some key points referenced in the literature that are unique for Web pages and screen displays include:

- *Page Layout:* consistent display structure; menus to allow students to select topics; chunking with no more than 60 characters per line; use of the full screen space (rather than squeezed text with a lot of blank space around); backgrounds to distinguish different sections; a menu or panel in view to enable users to keep track of where they are in a Web site; familiar, simple, and few navigation icons (fewer pathways are better)
- *Text and Visuals:* easy-to-use buttons or dials for navigating forward, back, and between sections; avoiding too many hypertext links within a paragraph; making minimal but functional use of symbols and graphics
- *Language and Text:* short text sections that convey one main idea with ways to get more details after the main idea (some research found that removing more than 40% of the text made no difference)
- *Font Styles:* proportional spacing style such as Times Roman New and simple *sans serif* such as Verdana

- *Colors:* Colors to show functions; black on white, black on medium gray, dark blue on yellow (dark text, light ground); white on black, white on dark blue, yellow on black (light text, dark ground); not red-green or blue-yellow—they are difficult for people who are color-blind to see

(Dunlap, 1998; Erdogan, 2008; Hartley,1996; Hill,1997; and Mikk & Luik, 2003).

Visual Features

Visuals can be major contributors to *readability* and *pacing* of content when they have integrity with the concepts targeted in the text, fit well with the abilities of the students, and serve an instructional purpose. There is significant evidence that memory for pictures is better than memory for words; for this reason it is especially important that the visuals have instructional integrity (Sewell, 2000, p. 35; Anglin, Vaez, & Cunningham, 1996, p. 871).

Types of visual representations. These can include boxes, cartoons, chains, concept maps, circle diagrams, diagrams, flowcharts, graphs, graphics, grids, hierarchies, icons or symbols, matrices, models, pictures, pyramids, schematic diagrams, sketches, symbols, timelines, towers, sequence story maps, simple line drawings, and tables (Anglin, Vaez, & Cunningham, 1996; Crowl, Kaminsky, & Podell, 1997; Bloom, 1956; Clarke, 1990; Holliday, 1990; Kauchak & Eggen, 1998; Ornstein, 1992).

Uses of visual representations. They can vividly portray ideas, illustrate vocabulary, show concepts, feature how things work, and show patterns of quantitative data. They can give students practice in elaborating on concepts by adding details, explanations, examples, and relevant information from prior knowledge. Instructional activities can lead students to form their own visual images, analogies, metaphors, and concept maps. Concept map generation can be applied to any domain; engage critical thinking; facilitate transfer; improve comprehension and memory; and improve critical, creative, and complex thinking skills (Anglin, Vaez, & Cunningham, 1996; Kauchak & Eggen, 1998; Marzano, Norford, Paynter, Pickering & Gaddy, n.d.; Joyce, Weil, & Calhoun, 2004, pp. 180-181; Jonassen, 1996, pp. 97-102).

Words and visuals work together. "…cognition is served by two interdependent systems, one of which is specialized for dealing with verbal information (i.e., text and speech), while the other processes non-verbal information (i.e., graphics and animation)" (Kuzu, et al., ¶6). Students can build connections and gain conceptual understanding when visuals are closely integrated to the text and are as simple as possible, becoming complex only if needed to fit a learning purpose. Visuals will overload working memory when they are too complex, extraneous, or poorly presented (Gobert & Clement, 1999; Kealy, 2000; Kuzu, et al., ¶3*)*

Different visuals for low-ability vs. high-ability students. Learning improves with illustrations that are not exactly repetitive of text and that function to define, explain, clarify, or organize information already presented. Such illustrations especially help low-ability students. Experts relate that low-ability students need more pictured and labeled concepts and fewer relationships while high-ability students can be challenged with visuals that communicate large amounts of complex information including extensive flow diagrams and complex arrangements of drawings and

photographs (Mikk & Luik, 2003; Kuzu, Akbulut, & Sahin, 2007; Luik & Mikk, 2008; Holliday, 1990, 28).

In general, visuals support student learning when they:

- support or are substituted for verbal information;
- appear near corresponding text;
- show a consistent, clear, and coherent structure. Having the same structural integrity as the text (e.g., if cause-effect is in the text, then "cause-effect should be supported with the illustrations); and
- are simple, clear, and consistently used within the materials (e.g., drawings, cartoons, diagrams, maps, graphics, pictures, models, different styles to signal different types of information

(Mikk & Luik, 2003, p. 535; Mayer cited in Kuzu, et al., ¶20).

Pacing of Content

The amount of content presented at one time or the pace at which it is presented must be of a size or rate that allows students to perceive and understand it.

Pacing must consider

- cognitive load.

Cognitive Load

It is important that materials contain "bite-size" chunks or blocks of information. The chunks should not be so large, nor the pacing so fast, as to overwhelm students. Neither should the chunks be so small, nor the pacing so slow, as to bore them.

Visuals and some media treatments can create, or ease, cognitive load. When visuals help with grouping of information and align with text, they ease the cognitive load. For particular subject areas, certain types of cognitive load may require consideration, in which the pacing of materials may require more careful consideration than for other subject areas.

Avoiding cognitive overload. Many factors of presentation and can be addressed by pacing in the following ways:

- providing a variety of activities from which learners can choose;
- grouping information and directions to allow choices in what to read and what to do next;
- providing directions and activities that require learners to generate their own examples or to think of new situations; and
- presenting problems and contexts for applying what students learn, and discovery activities.

For interactive instructional media, it is particularly important to provide wait time after a question, because students differ in the rate at which they respond (Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998).

Ease of Materials Use

Both print and other media formats of instructional materials must be easy to use and replace and be durable enough for multiple uses over time.

Items that contribute to ease of use are

- warranty,
- practicality of use, and
- durability of materials.

Warranty

The actual physical and technical qualities of materials should match the description contained in the publisher's *warranty*. In addition, instructional materials must be designed for practical use in the classroom and school environments.

Use

For practical use in classroom and school environments, materials must be easy to identify, store, and access. Some of the factors influencing their ease of use include: number of components, size of components, packaging, quality of materials, equipment requirements, and cost to purchase or replace components.

Choices concerning weight, size, and number of volumes depend on several factors, such as the organization of the content, how well separate volumes may fit time periods for instruction, and the ages of students. Technical production requirements, such as page limits or different types of bindings, may lead to multiple volumes.

Ease of use. Examples of classroom use include repeated copying of consumable materials and repeated use of other materials by students over time. Students should be able to easily use the materials and take home, in a convenient form, most of the material they need to learn for the course.

Implementation. The physical and technical qualities of materials should match the resources of the schools. Materials such as videos, software, CDs, Internet sites, and transparencies may serve instructional purposes well, but have little value unless they can be implemented with the school's equipment. If needed, publishers should include training, in-service, and consultation to help in effective use of the materials.

Use of technology. Technology-rich resources should work properly without the purchase of additional software and run without error. Electronic media for student use should be encoded

to prevent accidental or intentional erasure or modification. As with textbooks, electronic media should allow students to easily access and interact with them without extensive supervision or special assistance.

Technological materials should be "worry-free," run properly, and have audio and visuals that are easy to hear, see, and control. It is essential to have the publisher's guarantee for replacement and for conditions and agreements for reproduction.

Laws and requirements. Materials must satisfy laws and requirements such as the Americans with Disabilities Act, the Individuals with Disabilities Education Act, the Instructional Materials Accessibility Act, the Children's Online Privacy Protection Act, and the Families Educational Rights and Privacy Act of 1974. In addition, materials must meet Web and technical standards such as the World Wide Web Consortium, Web Accessibilities Initiative, Digital Accessible Information System for Talking Books, Open e-Book Forum, CAST, and NASTA.

Specialized formats required to comply with accessibility legislation must be delivered to the schools before or concurrent with their print counterparts. Specialized formats include Braille, audio, digital text, and large print. For such materials, publishers must meet technical specifications in preparing and delivering instructional materials for review and adoption. The Florida Department of Education provides specifications for alternative formats, or links to such information, in the packets prepared for publishers (NIMAS).

Durability

The conditions of expected use determine how durable the materials need to be. In general, for print materials, binding should be tight and firm, paper should be of adequate weight, and the size of the pages should be practical for use and storage (Frank, 1988; Marland & Store, 1982). Boxes, books, or other materials should not fall apart after normal classroom use. The packaging and form of materials should be flexible and durable enough for multiple uses over time.

Publishers must provide updates for electronic materials, including online textbooks, electronic books, integrated learning systems, skill-building programs, portals, video, software, and handheld devices.

Cost[4]

Cost, while not a direct factor in ease of use, influences the ease with which materials can be obtained or replaced. Regarding cost, Florida's Commissioner of Education will consider the impact of cost in making final decisions. Cost can be complex to estimate; it requires considering the number of materials available at no additional cost with the purchase of the major program or text, the cost over the adoption period of several years, and the number of ongoing free materials to support implementation.

Attractive features may escalate cost without enhancing learning effectiveness. Sometimes cost is not about money but a question of how well the physical and technical features of materials match the resources of the schools.

4 Committee members do not need to evaluate the cost of materials, although concerns about cost may be expressed if they arise during the review of the materials.

Priority Area: Learning

Learning review includes examination of strategies in instructional materials that support motivation, including "big ideas," explicit instruction, guidance and support, active participation, and the instructional and assessment strategies that make sense for the targeted learning objectives.

Teachers make a difference in student learning, and materials with effective learning strategies can support or impede their impact. Yet, insufficient number, type, and quality of learning strategies have been persistently identified in textbooks. Learning also has been undercut by the absence of meaningful explanations, connecting ideas, big ideas, underlying structures, and content for critical thinking (Schroeder, Scott, Tolson, Huang & Lee, 2007, p. 1438; Caron, 2005; Goldstein, 2001; Harniss, Hollenback, Crawford, & Carnine, 1994; Ornstein, 1992; Sewell, 2005; Woodward & Tyson-Bernstein, 1986; Mestre, 2001; Sewell, 2005; Watts-Taffe, 2005).

Although explicit instruction in thinking skills, combined with content that is deeply processed is more likely to be remembered and promotes both intellectual and academic achievement, textbooks for social studies, math, and science generally fail to include powerful instructional strategies to support students in becoming strategic readers of content. However, one study of sample social studies textbooks noted some positive trends, finding more questions that required students to understand, apply, synthesize, and evaluate concepts (Risner, Nicholson, and Webb, 2000; Ciborowski in Fiore & Cook, 1994; Bryant, Bryant, Kethley, Kim, Pool, & Seo, 2008; Jitendra, Gomez, and Yan Ping, 1999; Kassem, 2006; Kragler, Walker, & Martin, 2005).

In this section on learning, research-based information will show what works across disciplines along with a few particular strategies for selected subjects and students. In this regard, two special cases for learning strategies deserve special attention:

- The first is the expertise reversal effect. This phrase refers to the finding in several studies that students who possess high levels of expertise in a subject do NOT benefit from the same strategies that work for average students or those who possess low expertise. Instead of the usual guidance and support, such students require direct information they can integrate for themselves with what they already know.
- The second is the powerful resistance to learning, which is due to students' misconceptions in a subject area. For these students, traditional strategies also fail to work (Mestre, 2001). Instead, they require the opposite of what works for students who have high expertise. Instead of direct instruction, these students require *intense constructivism* to break through their misconceptions. Constructivism is so effective that it can lead to *learning the wrong stuff*, which probably is how many students form their misconceptions. Once learned, it is hard to "unlearn." For this reason, constructivist activities require a process more like the "controlled floundering" used in Pogrow's higher-order thinking skills program, in which students have structure and content to find their way with guidance (Pogrow, 1990; Kassem, 2006). Students require intense practice with new concepts, showing themselves multiple times that the "new concepts" work to override the "old wrong concepts."

Therefore, if examining instructional materials that will be used by students who have exceptional expertise, more direct instruction and fewer guided activities may be appropriate. For those who are likely to have misconceptions to "unlearn," it will be especially important to examine the kind, frequency, and intensity of active participation and lesson-related tasks included with the materials.

Motivational Strategies

Instructional materials must include features to maintain learner motivation.

Features that maintain student motivation include

- positive expectations
- feedback, and
- appearance.

Setting Positive Expectations

In addition to the clear statement of goals in setting expectations, development of the right *climate for learning* sets expectations and contributes to students' motivation, involvement, learning outcomes, and contentment. The learning climate must be intentionally designed into a course.

Factors that contribute to a learning climate include:

- friendly, attentive, and encouraging communication;
- student collaboration assignments and group projects;
- student communication and presentations; and
- informative feedback on student progress

(Fisher & Baird, 2005; Kassem, 2006; Reio & Crim, 2006).

The degree of *challenge and relevancy* of activities also influences positive expectations. Summaries of research include the following findings:

- *Challenge works–not too easy, not too hard.* Students decrease effort when learning tasks seem too easy or impossibly difficult. Easy ones are not challenging enough; hard ones overload working memory so that students "give up" on making the effort to learn. Thought-provoking challenges could include paradoxes, dilemmas, problems, controversies, and questioning traditional ways of thinking. For interactive instructional media, it is particularly important to provide wait time after a question, because students differ in the rate at which they respond (Clark & Feldon, 2005; Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998).
- *"Relevant" helps; "irrelevant" hurts.* A relevant or familiar context helps, such as relating learning to students' previous experiences or knowledge, or relating the students' or school's environment to the learning (e.g., using problem-based learning, taking field trips, using the schoolyard for lessons, encouraging reflection) (Schroeder, et al., 2007).

Adding unnecessary or irrelevant features of media or content can create too much of a cognitive load and interfere with learning; similar results on integrity of design for social dynamics and learning goals for gaming and simulations have also been reported. Successful attributes included high fidelity to real tasks, to real environments, or to the physical properties of what they were intended to model (Clark & Feldon, 2005; Gredler, 2004; Reiber, 2004).

- *Personal connections improve learning.* The following strategies help students make personal connections to the course content and improve their learning:
    - ◊ using examples from student life, current events, and popular culture;
    - ◊ asking students to share personal examples, insights, experiences, or interpretations related to what they are studying;
    - ◊ asking students to answer self-assessment questions, to defend positions or controversial issues; and
    - ◊ asking students to write personal essays, engage in role plays, analyze case studies, and deal with real-world problems.

  Students also develop personal connections through constructivist activities such as inquiry learning and allowing students to "create and use their own approaches to designing and developing the project" (Drummond, 1998, 2004; Bonwell & Eison, p. 17, 1991; Kauchak & Eggen,1998; Stanford University Center for Teaching and Learning, 2007).
- *Adults need practical applications.* Adults (older students) learn better when they are told why they need to learn something and experience an application of its value; this could include problem solving, sharing their related life experiences, and having a role in shaping the content and activities of the course (Morland & Bivins, 2004).

Feedback

Students are motivated by informative feedback about correctness, incorrectness, and how to improve what they are learning (Fisher & Baird, 2005; Reio & Crim, 2006).

Appearance

While materials should have features that make them appealing, some research has shown that students may actually find materials with "flashy" treatment to be dull. This happens when these types of materials provide only tidbits of information, lack integration of subject matter, and oversimplify or limit thinking (Holliday, 1990; Loewen, 1995; Ornstein, 1992).

Teaching a Few "Big Ideas"

Instructional materials should thoroughly teach a few important ideas, concepts, or themes.

"Big ideas" or "major themes" provide

- focus for students and
- completeness.

Focus for Students

"Big ideas" include major themes, core concepts and principles, or a few "powerful ideas" for the subject being studied; they are important because they help students organize what they are learning, follow the sequence of learning, and make sense of the information, facts, and concepts (Ornstein, 1992).

Students learn more when given the "big ideas" or major themes before they study; or when they are asked to build their own way of representing ideas and relationships, such as their own concept maps, outlines, analogies, hierarchies, tables, matrices; or when they are asked to brainstorm what they think they know about a topic (Bonwell & Eison, 1991; Clarke, 1990; Cotton, 1997; Crowl et al., 1997; Kauchak & Eggen, 1998; Stanford University Center for Teaching and Learning, 2007).

Materials organized around "core thinking skills" could be one approach to "major themes" for a course, such as

- defining problems
- setting goals
- gathering, observing, formulating questions about information
- encoding, recalling
- comparing, classifying, ordering, representing
- identifying attributes and components, relationships and patterns, main ideas, errors
- inferring, predicting, elaborating, integrating, summarizing, restructuring, reorganizing
- evaluating

(Marzano, 1994; McREL, 1997).

Materials organized around McREL's "dimensions of learning" could be another approach that focuses on major themes

- Dimension 1: Attitudes and Perceptions
- Dimension 2: Acquire and Integrate Knowledge
- Dimension 3: Extend and Refine Knowledge
- Dimension 4: Use Knowledge Meaningfully
- Dimension 5: Productive Habits of Mind
    - ◊ Critical thinking
    - ◊ Creative thinking
    - ◊ Self-regulated thinking

(McREL, 2008a, p. 1)

Completeness

The thorough teaching of a few big ideas may focus on developing a deeper and more complete understanding of a discipline's major themes, the content of the subject area, its relationship to other disciplines, and the thinking and learning skills required for achieving the specified learning outcomes.

For particular subject areas, certain "big ideas" or themes may have high importance. For example:

- The National Science Education Standards set "a limited number of important concepts, principles, facts, laws, and theories" that include "unifying concepts and processes in science," and "science as inquiry" (1993, p. 5; 2008, ¶ 1).
- The National Council of Teachers of Mathematics aims to "connect ideas, both among and within areas of mathematics" in schools rather than in "isolated concepts and skills" (1989; 2008).
- The National Center for History standards name five interconnected dimensions of thinking: chronological thinking, historical comprehension, historical analysis and interpretation, historical research, and issues-analysis and decision-making (National Center for History in the Schools, 2008, ¶ 5).

Explicit Instruction

Instructional materials must contain clear statements of information and outcomes.

Explicit instruction depends upon

- clarity of directions and explanations, and
- exclusion of ambiguity.

Clarity of Directions and Explanations

For thinking skills, clarity includes explicit instructional communication of the skills to be learned; prerequisite knowledge and skills; clear directions for assignments; sample problems, examples, and explanations of steps to follow; questions that go beyond recall of information; guidance; practice; and feedback with remediation. Learning improves with clear objectives and interactions focused on specific problem solving and explicit teaching of thinking skills (Bonwell & Eison, 1991; Kassem, 2006).

Similarly, the development of learning skills requires explicit directions about *when* and *how* to do different types of learning activities. Students benefit from knowing and practicing active learning strategies for remembering and using new information, such as:

- explanations and examples of learning processes;
- directions on how to preview, question, read or listen, reflect, recite, and review;
- directions on use of learning techniques such as note taking, outlining, paraphrasing, ab-

stracting and analyzing, main idea summarizing, self-coaching to reduce anxiety, imaging to relate vocabulary words and meanings, memory strategies and devices; and

- encouragement to use persistence and personal control for learning how to learn

(Gagné, 1985; Briggs, & Wager, 1988; Glaser, 1941; Kauchak & Eggen, 1998; Maryland State DOE, 1990; Pogrow, 1990; Montague & Knirk, n.d.).

Clarity also is influenced by the progression of complexity in the materials. Students are more successful when their learning tasks increase in complexity of content and diversity of applications across successive intervals of time (Crowl, Kaminsky & Podell, 1997; Marzano, Brandt, Hughes, Jones, Press, Eison, Rankin & Suhor, 1988).

Students also need clear instructions for assignments (Hines, Cruickshank, and Kennedy; and Snyder, et al., cited in Kauchak & Eggen, 1998).

Advance organizers create a structure for learning and organizing new information; they may include a brief, highly condensed outline given before instruction, a major or anchoring idea given with each new section or topic, or an analogy or metaphor to compare one principle, idea, or feature to another. They improve retention, higher-order learning, and transfer; however, they have a more powerful effect if materials are poorly organized, probably because they help direct students' attention (Gagné, 1985; Gagné Briggs, & Wager, 1988; Marland & Store, 1982; Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998; Marzano, 1992, ¶1; Maryland State DOE, 1990; Cotton, 1997; Martorella, 1982; Osborn, Jones, & Stein, 1985).

Exclusion of Ambiguity

Evaluation of the explicitness of instruction includes noting that instructional materials are using phrases with ambiguous meanings, confusing directions or descriptions, and inadequate explanations.

Guidance and Support

Instructional materials must include guidance and support to help students safely and successfully become more independent learners and thinkers.

Effectiveness of guidance and support depends on

- level and
- adaptability.

Note: "Guidance and support" and "explicit instruction" (described in the previous section) are closely related criteria categories. While there may be some overlap, "explicit instruction" focuses more on the clarity and organization of instruction; "guidance and support" focuses more on what guides the process of the student's work.

Level of Guidance and Support

Guidance and support most often come from a good teacher, but instructional materials can support or interfere. For example, teachers can provide overviews and organized routines, but instructional materials can do the same with the consistency of routines in an online menu or within the pages of a chapter. Students can receive previews and worksheets that help them to organize what they are learning, especially at the early stages of learning something new when they will require more hints and prompts. The literature has established the various modalities of learning styles, so it makes sense to include a variety of appropriate activities.

Organized routines. Guidance and support provide organized routines for orderly learning and future searching of information, and they make learning time more productive. For example, in seemingly simple tasks such as *memorizing* strings of digits, students can practice for hours without improving their performance unless they are shown how to use grouping and coding schemes to help them learn. Organized routines support the learning of *concepts* (e.g., telling the students the steps to follow or strategy to use in solving a problem).

An example of an organized routine would be to give the structure for a task followed by practice *before* moving on to production, and then to provide guided practice *before* independent practice (Montague & Knirk, n.d.; Kameenui, 1991, 369; Crowl, Kaminsky, & Podell, 1997; Clark & Feldon, 2005; Glaser, 1941; Kauchak & Eggen, 1998; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Williams, 1995).

Better thinking skills. Students also develop better thinking skills when provided guided instruction in the form of names and definitions of the targeted thinking skills, models and explanations, and when given opportunities to practice the thinking skills, and broad problem-solving strategies, algorithms, or analogies (Cotton, 1997; Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998).

Feedback. A key part of guidance is the kind of periodic feedback provided to students. Students who receive constructive feedback about the accuracy and adequacy of performance become more interested in the class and learn more. Students benefit from tips on how to learn from mistakes. For example, "Good question" does not work as well as immediate, specific, and corrective information, such as "Yes, the apostrophe in this case indicates a contraction, not a possessive," or a simple correction to an error that has been made (Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998; Flanagan & Mott, 2003).

Praise alone is insufficient; students require informative feedback to learn. Qualities of informative feedback include a focus on content, accurate explanation of errors, explanation of how to reach a correct answer, immediate and frequent feedback, and occasional *positive* motivational messages to express high expectations for success. The combination of informative and positive *feedback* on progress, including in print materials, has been found to be just as important in gaming and simulations (Crowl, Kaminsky, & Podell, 1997; Kauchak & Eggen, 1998; Montague & Knirk, n.d; Drummond, 2004; Gredler, 2004).

Other forms of guidance. Questions provide powerful guidance, and it is particularly effective to vary timing, positioning, or cognitive levels of questions. (Activities that require students to identify similarities and differences, to summarize and take notes, or to do homework and other kinds of practice also are effective). Review of content also functions as guidance and improves learning of concepts and principles, such as reviews that are at the end of a section or chapter and spaced between sessions of learning (Schroeder, et al., 2007; Marzano, 2002, ¶1; Marland & Store, 1982; Harniss, Hollenbeck, Crawford & Carnine, 1994, 245; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin & Suhor, 1988, 40).

Adaptability of Guidance and Support

Guidance and support are not "one size fits all." For particular subject areas, certain types of guidance and support may be listed as having high importance. For advanced students, the level of guidance and support would not be the same as for beginning students or for younger students.

Lectures help "advanced" students; "average" students need scaffolding. Research shows that students with less expertise require more structure, active learning, and guidance such as examples, hints, explanations, practice in working with concepts and examples, and feedback on how they are doing. Scaffolding needs to fade as students gain knowledge and skills. For students who have advanced expertise in the subject content, the use of structured guidance and hands-on activities can backfire and interfere with learning (Kirschner, Sweller, & Clark, 2006; Kauchak & Eggen, 1998; Verner & Dickenson, 1967, p. 90; Ringenberg & VanLehn, 2006; van Merriënboer, Kirschner, & Kester, and Kalyuga, Ayres, Chandler, & Sweller, and Kalyuga, Chandler, Tuovinen, & Sweller, cited in Clark & Feldon, 2005; Kirschner, Sweller, & Clark, 2006).

Scaffolding supports advanced learning. Asking focused questions, giving prompts or tips, modeling the thinking process and explaining it, and giving informative feedback moves students toward higher levels of learning. This support is needed until students can solve problems independently. Scaffolding includes just enough guidance and support with gradual transfer of responsibility for learning from teacher to student (Vygotsky, cited in Crowl, Kaminsky, & Podell, 1997; Crowl et al., 1997; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988).

Too much feedback interferes. Feedback can be overdone. Too much explanation can interfere with learning.

Materials should accommodate differences in learning styles with a variety of activities and modalities. (Learning differences include slow versus fast, impulsive versus reflective, field dependence versus independence, and modalities–spatial, mathematical, logical, and other dimensions of intelligence.) Effective instructional approaches include alternative problems, tasks, and projects; encouragement of reflectiveness; individual as well as group work; structured and unstructured activities–some with more explicit instructions or prompts, especially at the lower grade levels (Maryland DOE, 1990; Kauchak & Eggen, 1998; Martorella, 1982).

- A feasible approach to accommodate different rates of progress among students is to provide alternative learning materials with additional support and guidance for those who need it and additional enrichment activities for the others. Similarly, activities that support

modifying instructional materials work well (e.g., rewriting or annotating text materials, tape recording directions, simplifying laboratory apparatus) (Kauchak & Eggen, 1998; Carnine, n.d.; Schroeder, et al., 2007).

- A variety of *modalities* for students' various learning styles also provides adaptability of guidance and support in instructional materials. Examples of types of activities include verbal-linguistic; logical-mathematical; musical, spatial; and bodily-kinesthetic (Crowl, Kaminisky, & Podell, 1997; Kauchak & Eggen, 1998; Kirby & Kuykendall, 1991; McPeck, 1990; Sternberg, 1998).

Guidance and support in online learning. Student characteristics also can influence how much they benefit from the use of technology in learning. Artino (2008) reported that students who can self-regulate, who possess self-efficacy, and who collaborate and seek success from others will be more successful with online learning. Without explicit guidance, few students will use thinking skills in online discussions. Students will have difficulty with cognitive overload, error messages given in a negative rather than a positive way, and poor presentation style (Mikk and Luik, 2003).

Differences for low-ability and high-ability students online. Liuk and Mikk (2008) reported the following:

- Analogies help students make connections between concepts, help with self-assessments, and improve test scores; features of multimedia make more of a difference for students with lower prior knowledge.
- Animations help both low- and high-ability students.
- High achievers seek to understand the content rather than memorize the terms, symbols, and formulas; low achievers seek to memorize the terms, symbols, and formulas.
- High-achieving students benefit from key combinations, menus with different levels, analogies, fewer terms in the content, more learner control, and use of the Internet.
- Low-ability students benefit from illustrations.
- Low-achieving students benefit from clear instructions, guidelines for self-assessments, familiar icons, examples, many questions (rather than fewer for high achievers), feedback on percent of correct answers, use of a mouse, and answering from the keyboard.
- Low-achieving students learn less with complex graphics, over-saturation of terminology, complex presentation of text and graphics, too much hierarchy in navigation, and too many navigation tools.

Summary of types of guidance and support. In general, the types of guidance and support that have been effective in supporting student learning include the following features:

- goals at the beginning of an assignment;
- organized activities and routines;
- explicit organizational schemes and explanations;
- examples of finished products, sample problems, and models;

- visual representations of concepts in concept maps, models, metaphors, subheads, lists, graphs, charts, italics, boldface, any other highlighting device;
- visual representations of problems organized into drawings, graphs, tables, hierarchies, or lists or maps of the parts of particular skills to be learned and the prerequisite knowledge and skills;
- descriptions of thinking processes to use in working through examples or problems or developing products *before* independent practice;
- cues, prompts, hints, structure, and information to guide thinking or steps during initial practice;
- transition signals to communicate that one idea is ending and another is beginning and to explain logical connections; meaningful or logical transitions that connect information into an organized whole, not just dissociated parts;
- telling students when and where and to what information they should pay attention; and
- study guides with objectives, concepts, and questions

(Clarke, 1990; Crowl, Kaminsky, & Podell, 1997; Gagné, Briggs, & Wager, 1988; Kauchak & Eggen, 1998; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Marzano, 2002, ¶1; Montague & Knirk, n.d.; Stanford University Center for Teaching and Learning, 2007; Young & Reigeluth, 1988).

Active Participation of Students

Instructional materials must engage the physical and mental activity of students during the learning process.

Whether or not the instructional materials sufficiently engage active participation of students is determined by the

- assignments and
- student responses.

Assignments

Assignments should be logical extensions of the content, goals, and objectives. In addition, they will be more effective when they are organized, periodic, frequent, and short.

Particular strategies work well to engage active participation while others diminish it. The following strategies have been reported in various recent studies about constructivist instructional approaches for developing concept learning and problem-solving skills in several disciplines:

- ***Interactive Coaching:*** Convert "lectures" into "interactive environments" in which the teacher becomes the "coach, mediator, and facilitator" and students become active in seeking information and solutions (Mestre, p. 12).
- ***Classroom Discussion:*** Begin with classroom discussion and questions; make the relationships explicit among and between major concepts and their ancillary concepts (pp. 11-12).

- ***Explanations and Reasons:*** Explain concepts that are useful to apply in coming up with possible solutions, and then explain why those concepts are useful (p. 11).
- ***Questioning and Guidance:*** Ask and guide students in describing the "principles, concepts, and procedures that could be applied to solve [specific] problems" (p. 11).
- ***Problems and More Problems:*** Give students problems to categorize and ask them to identify underlying concepts and principles and/or generate meaningful questions or hypotheses.
    - ◊ "Construct pairs of problems that share the same surface characteristics but are solved by applying different concepts" (p. 11).
    - ◊ "Construct pairs of problems that, on the surface, look quite different but are solved by applying the same concept" (p. 11).
    - ◊ Construct problems with "multiple right answers" (p. 12).
- ***Safety and Relevance:*** Provide safe and supportive structures, resources, and a meaningful question or set of questions that allow "students the freedom to explore and learn on their own" (p. 12). Teachers must stay hands-off during this inquiry phase, but be available when students need help.
- ***Collaboration:*** Have students work on these kinds of problems in pairs or groups.

Structured inquiry in science. Mestre (2001) identified three major phases that can create a well-managed constructivist learning process:

- ◊ **Phase 1:** Classroom discussion of experimental design with emphasis and guidance for students on how to generate meaningful questions and appropriate procedures, followed by dividing the students into "collaborative working groups, each having the responsibility of exploring a question or related set of questions" (p. 12).
- ◊ **Phase 2:** Student application of techniques for "observation, measurement, and analysis" followed by groups performing preliminary analysis of their data and drawing preliminary conclusions (p. 12). (This phase assumes that students possess some knowledge of the techniques to apply.)
- ◊ **Phase 3:** Whole class discussion in which groups "pool their findings and work on answering the questions or hypotheses posed in phase one;" such discussion might lead to new questions or hypotheses to explore (p. 12).

Additional strategies that work well to engage active participation that improves learning, are:

- ***Frequent quizzes.*** Scheduling a quiz or exam stimulates students to study. Students can remember as much as twice the amount of both facts and concepts after taking a quiz or exam (Bonwell & Eison, 1991).
- ***Tests with feedback.*** Testing produces better long-term retention than repeated studying (Karpicke & Roediger, 2008). Open-book and closed-book tests with feedback to students on their answers improve learning (Agarwal, Karpicke, Kang, Roediger, & McDermott, in press

in 2009).

- ***Students contributing content.*** When students generate their own charts or worksheets for study, and do their own investigation of a topic individually or in teams, they successfully learn concepts and rules. Examples: Ask students to find and report on a relevant research article or news event and explain its usefulness, strengths, and weaknesses; ask students to write an exam question about what they consider to be the most important concept in a module (Kauchak & Eggen, 1998).
- ***Interactive tasks.*** Cooperative learning is a key strategy. Arranging students in flexible groups to work on various tasks (e.g., conducting lab exercises, inquiry projects, and discussions produces better learning; interactive video produces better learning than passive viewing (Marzano, 2002, ¶1; DeBloois, Fletcher, & Batey & Cowell, cited in Zirkin & Sumler, 1995; Schroeder, et al., 2007).
- ***Questions or activities should require working in pairs or groups.*** Forms of group work found to be effective for the development of thinking skills include student discussions, peer tutoring, and cooperative learning. There should be a variety of peer tutoring, cooperative learning, collaborative problem analysis, team-assisted individualization, and/or group investigation and debate (Crowl, Kaminsky, & Podell, 1997; Young & Reigeluth, 1988; Kauchak & Eggen, 1998; Montague & Knirk, n.d.).
- ***Manipulations (sometimes called "hands-on-minds-on").*** Students learn better when provided with opportunities to work or practice with physical objects (e.g., developing skills using manipulatives or apparatuses, drawing or constructing something) (Schroeder, et al., 2007).
- ***Practice.*** Practice of lesson-related tasks promotes learning. Students should have opportunities to practice the steps of procedures, new behaviors, or skills. Students benefit from stages of small practice sets to improve speed and accuracy as well as periodic, frequent, short assignments that are logical extensions of content, goals, and objectives (Kauchak & Eggen, 1998; Montague & Knirk, n.d.; Maryland DOE, 1990).
- ***Cooperative and active tasks.*** Promoting interactions between students improves learning and student responsibility for learning, as well as cognitive development (Green, n.d.; Reio & Crim, 2006).

  Examples of cooperative active participation tasks include:

  - ◊ ***Example 1:*** "Like a jigsaw puzzle, each member of the team is assigned a portion of the whole. Ultimately responsible for knowing all, each group member teaches the others about their piece. Learners need explicit preparation on how to effectively communicate information to others" (Drummond, 1998, 2004).
  - ◊ ***Example 2:*** "Whatever material is to be learned is presented to teams in the form of a manuscript or text followed by a multiple-choice test requiring conclusions or inferences, not locating information in the readings. After completing the test, learners join teams of five to discuss the questions and arrive at consensus as to the most valid answer to each question, without consulting the reading. Then a key is distributed and learners score individual answers as well as the team

answers" (Drummond, 1998, 2004).

◊ ***Example 3:*** "The teacher prepares an attitude questionnaire, usually a multiple-choice inventory. Each learner selects from the range of alternatives those that most accurately represent his or her views. Next, teams meet to reach agreement on which of the alternatives represents the soundest action in a particular circumstance. They examine the differences between previous attitudes and discuss together how each may want to be consistent with the agreed-on description of the soundest attitude" (Drummond, 1998, 2004).

Student Responses

Students learn more when they do the following kinds of activities:

- generate their own charts or worksheets for study;
- summarize and take notes;
- identify similarities and differences (compare, classify, create metaphors, create analogies);
- explain concepts and problem-solving steps to each other;
- discuss controversial issues;
- work together in pairs or groups, particularly if they tackle more difficult learning tasks than individuals would be able to manage on their own;
- participate in peer tutoring;
- generate their own questions about topics after receiving guidance about how to do so;
- relate, organize, and represent knowledge in a new way;
- use non-linguistic methods to organize and display knowledge (graphic organizers, pictures and pictographs, mental pictures, concrete representations, kinesthetic activity);
- generate and test hypotheses; and
- construct their own knowledge

(Crowl, Kaminsky, & Podell, 1997; Green, n.d.; Marland & Store, 1982; Maryland DOE, 1990; Marzano, 2002; Mestre, 2001; Montague & Knirk, n.d.).

Students learn more when they do the following kinds of assessment activities:

- provide written answers to questions
- give explanations (e.g., explain "where did this step come from?" or "why was this step done?")
- do case-based self-assessments to improve learning
- take frequent quizzes
- review feedback from test results

(Bonwell & Eisen, 1991; Cook, Thompson, Thomas, Thomas, & Pankratz, 2006; Cotton, 1997; Karpicke & Roediger, 2008; Ringenberg, 2006).

Targeted Instructional and Assessment Strategies

Instructional materials should include the instructional and assessment strategies known to be successful for teaching the learning outcomes targeted in the curriculum requirements.

Successfully teaching the targeted outcomes depends upon

- alignment of strategies and
- completeness of strategies.

Alignment of Strategies with Outcomes

A learning outcome refers to what a student should know or be able to do at the end of instruction, while a learning strategy is the method or series of activities provided for the students to achieve the targeted outcome.

Instructional materials should use instructional strategies that have been suggested as being effective in producing specific learning outcomes. Some strategies are more suitable than others for certain subject matters. For example, the use of scientific inquiry may be suitable for teaching physical science but may not be appropriate for language learning. These strategies are typically articulated through subject area vision statements and by professional organizations in their respective fields. For any subject area, there must be expertise available within the committee membership to be able to judge whether the learning strategies unique to the subject are present and to what degree.

In addition, some strategies work better when building basic skills but may be insufficient when developing higher-level cognitive abilities. For example, students learning a new language may rely more on recall of new words and drill-and-practice to learn basic phrases. As they gain proficiency, however, instructional strategies that require application of language rules may be more appropriate to achieve the learning outcomes.

There are various ways to classify learning outcomes and they typically begin with simple cognitive demands before progressing to higher levels of complexity. Gagné (1965); Gagné & Briggs (1979); and Gagné, Briggs, & Wager (1988) divided learning outcomes into five broad categories -- *verbal information, intellectual skills, cognitive strategies, attitudes,* and *psychomotor skills.*

On the other hand, the revised Bloom's taxonomy (Bloom, 1956; Anderson & Krathwohl, 2001) categorizes learning outcomes as *factual, conceptual, procedural,* and *metacognitive*. Similarly, Webb (2002) identified four levels of cognitive complexity consisting of *recall, routine skill or concept, strategic thinking,* and *extended thinking.* In this report, the research findings for instructional strategies have been organized to closely align with Bloom's taxonomy and Webb's depth of knowledge (DOK).

The term "assessment" as used in this section refers to testing or other strategies that evaluate student progress as a result of learning activities. Such evaluation serves a dual purpose: (1) to

assess individual student's performance with regard to target learning outcomes, and (2) to provide information about the kinds of revisions needed to improve instruction.

In meeting these dual objectives, it is very important for the assessment items to ask the right questions. If the assessment items match the target learning outcomes, then both students and teachers have relevant and valid information about the learning progress.

Completeness of Strategies

The combination of instructional strategies should also be complete enough to achieve the learning outcomes. In problem solving, for example, there should be instructional strategies that help students to recall facts, understand concepts, apply rules and principles, as well as use broad problem-solving methods. At the same time, there should be sufficient practice sessions and feedback for students to learn how to solve different types of problems. Using only one or two instructional strategies may not be enough to achieve the target learning outcomes, especially at higher levels of cognitive complexity.

Simultaneously, it is essential for the combination of assessment strategies to be comprehensive enough to achieve the targeted learning outcomes. Mestre (2001) highlighted cognitive research that indicates "knowing the separate parts is not equivalent to knowing the whole" (p.9). Therefore, it is important for assessment items to not be fragmented and decontextualized.

According to Mestre, teachers tend to fall into the trap of "teaching to the test," and students learn how to "get the right answer." This means that instructional time is spent learning "a collection of definitions and isolated bits of information" rather than how to analyze and use knowledge for solving problems (p. 9). In math and science, achievement and accountability tests tend to measure "recall of routine factual knowledge" rather than focus on problem solving. Assessments also can miss the mark when they are "made up of standard problems" rather than asking "questions that probe for understanding" (p. 7).

However, learning can be improved by changing the frequency, purpose, or cognitive levels of testing and evaluation. An example would be to provide immediate or explanatory feedback; using diagnostic testing, formative testing, retesting, or testing for mastery (Schroeder, et al., 2007).

Bass & Glaser identified three major principles that "make assessments informative to students" and thus improve teaching and learning. They are:

> *Models of competence* that give clear standards for what the student is expected to be able to do and how well the student is expected to do it;
>
> *Graphical tools to track progress* so that students can visualize their progress over a time period; and
>
> *Structured opportunities for reflection and revision* so that students have a structure that guides them in how to examine and make corrections in their performances.

Subsequently, some techniques for informative assessments include:

- Assessing to check student progress. Include assessments within units as well as at end of units.
- Using rubrics that "make students' thinking explicit and highlight areas for growth."
- Aligning rubrics with instructional situations.
- Determining how assessment results can be used to improve student performance.

Instructional Strategies and Assessment Techniques

When evaluating instructional materials, refer to the Florida Sunshine State Standards for the targeted learning outcomes, and then review the following list of instructional strategies and its corresponding assessment techniques to determine whether the materials are using the appropriate combination of methods. The following table provides guidance on key strategies that work for teaching different types of learning outcomes; they are organized by Webb's Depth of Knowledge model, which identifies four instructional levels of cognitive complexity. The key strategies represent information from a variety of research and are not from one single source. Generally, it would not be appropriate for all of these strategies to appear in a single set of instructional materials.

Instructional Levels, Outcomes, and Strategies

Instructional Level 1: Recall and Reproduce

Verbal Information	
Description	Any information, facts, or statements
Example	Learning new vocabulary, terms, labels, descriptions, numerical values, facts, statements, formulas, names, procedures, criteria, or any other information
Instructional Strategies	• meaningful context and connection with related information • coherent organization and themes • clearly identified keywords, concepts, main ideas, and patterns • opportunities for practice, feedback, and reinforcement • enrichment activities to encourage mastery
Assessment Strategies	Recall or restate information
Concept Definitions	
Description	Definitions of concepts
Example	Learning names of concepts and the distinguishing features of the concepts

Instructional Strategies	• clear definitions • labels or names for concepts • distinguishing attributes or main ideas • comparison of similarities and differences • strategies for recall of verbal information (above) (This instructional approach focuses only on learning the definitions, not on using concepts.)
Assessment Strategies	• define concepts or match concepts and definitions • recall how to classify previously seen (not new) examples and non-examples of the concepts into correct concept categories (This assessment approach tests only students' recall. Such recall stops short of the application of concepts, but often is the first stage of learning how to apply them.)
Comprehension	
Description	Understanding, explaining, organizing, using ideas and information relating new ideas to other information, summarizing, and restructuring information
Example	Learning the meaning and relevance of a topic or event
Instructional Strategies	• preview of key points or "big ideas" • outline or visual to show key relationships among ideas • concrete examples, questions, or metaphors to elaborate on important issues • activities that require students to paraphrase, find main ideas, relate new information to what they already know, construct their own diagrams of relationships, and to add their own details, explanations, and examples • activities that ask students to apply ideas and information in routine situations
Assessment Strategies	• summarize, restate, and explain ideas and information in new contexts • identify the correct meaning from new descriptions of the same ideas or information • place ideas or information into new charts, categories, or graphs • describe new situations in which ideas and information may be applied (This assessment approach tests only students' recall. Such recall stops short of the application of knowledge to a rule or problem.)
Procedural Knowledge	
Description	Recalling, restating, or describing steps, formulas, rules, or procedures (This knowledge level does not address whether someone can apply a procedure or use a rule; see the next section for application.)
Example	Listing and describing steps of problem solving, trouble shooting, scientific inquiry, social inquiry, jurisprudential reasoning, policy analysis, how to study, how to think, or any other set of procedures

Instructional Strategies	• introduction of the type of procedure (This could be any procedure such as a learning strategy, thinking strategy, problem-solving strategy, policy analysis, or other performance tasks.) • explanation of goals of the procedures • definition of context or facts that apply to use of procedures, and problems or situations for which procedures are appropriate • explanation of the process, methods, or steps in typical solution procedures • review of the concepts, rules, and principles that are being used in the procedures • explanation of the reasons that procedures work for different types of situations • practice on choosing procedures
Assessment Strategies	• restate or summarize different types of procedures • explain definitions and situations in which to use different procedures • choose which procedures to apply in different situations • describe procedures (This assessment approach tests only students' recall. Such recall stops short of the use of procedures, but often is the first stage of learning how to perform them.)

Instructional Level 2: Apply Skill or Concept

Cognitive Learning Strategies	
Description	Learning how to learn
Example	Learning how to use a mnemonic tool for learning or how to self-monitor and reflect on how well a memorizing task is working
Instructional Strategies	• review of when and how to paraphrase; summarize; self-question • use reference skills; organize; highlight; outline • use mnemonic devices; use imagery, analogies • use metaphors, and/or keywords; and other study skills • create situations for practice of the appropriate cognitive skills
Assessment Strategies	Identify and explain what learning strategies to use for different purposes
Multiple Intelligences	
Description	Developing linguistic-verbal, logical-mathematic, spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal abilities
Example	Learning to express ideas verbally, visually, and mathematically while working with other individuals on a team

Instructional Strategies	• verbal-linguistic activities requiring reasoning with language, rhythms, and inflections; and determining meaning and word order (e.g., in stories, readings, humor, rhyme, and song) • logical-mathematical activities requiring reasoning with patterns or strings of symbols (e.g., pattern blocks and activities to form numbers and letters) • musical activities requiring appreciation and production of musical pitch, melody, and tone • spatial activities requiring the learner to perceive and transform perceptions • bodily-kinesthetic activities requiring use and control of the body and objects • interpersonal activities requiring sense needs, thoughts, and feelings of others • intrapersonal activities to recognize and respond to one's own needs, thoughts, and feelings
Assessment Strategies	Demonstrate performance in the various intelligence modalities (Some recent research shows that when students work against their preferred modality, they actually learn more.)
Attitude Choices	
Description	Having predispositions to behave in certain ways
Example	Choosing to display courtesy; choosing a scholarly approach to learning
Instructional Strategies	• information on consequences of choices and behaviors • use of influential human and social models
Assessment Strategies	Freely make choices in different situations (Assessment must allow free choice to clearly assess a predisposition to behave in a certain way.)
Concept Applications	
Description	Recognizing and classifying **(1)** real objects by their physical characteristics (concrete concepts) or **(2)** abstract ideas by their essential defined features (defined concepts)
Example	**(1)** Learning the differences in models of aircraft by distinguishing features of physical appearance (concrete concept) or **(2)** learning the differences in freedom and responsibility by contrasting their definitions and implications for behaviors (defined concepts)
Instructional Strategies	• review of knowledge level of concepts (descriptions, definitions, similarities, differences, and distinguishing attributes) • sets of labeled examples and non-examples of the concepts • think sheets, concept maps (diagrams that show concepts and their linkages or hierarchy), and other visual-spatial displays of concepts • practice with a wide range of examples, starting with close examples and moving to far examples and/or successive presentation of more complex examples • practice in analyzing borderline examples of concepts • feedback on correct identification and classification of concepts • emphasis on building relationships between concepts

Assessment Strategies	• examine previously unseen (new) examples and non-examples of the concepts • identify or classify them into the correct concept categories (If instruction uses only *previously seen* examples, then only the knowledge level will be assessed.)
Routine Rules and Principles	
Description	Applying a rule or principle in a routine way to obtain a correct answer or outcome
Example	Using a rule, formula, equation, or algorithm to solve a routine problem
Instructional Strategies	• statement and explanation of the rule or principle to be used • review of vocabulary and concepts used in formation of principles such as cause-and-effect, correlational, probability, axiomatic, or fundamental principles • instructive examples with explanations, from simple to complex • practice in applying rule or principle, from simple to complex • presentation of several examples and non-examples with guided discovery of the principle or rule followed by opportunities for application and feedback on performance
Assessment Strategies	Given situations or routine problems, demonstrate correct use of the rule or principle
Procedure Applications	
Description	Applying a procedure according to standards of performance
Example	Execute a recovery from an aviation spin; correctly perform a needle puncture across the infra-renal aorta
Instructional Strategies	• review of knowledge level of procedures (type of procedure, purposes, context for using, definitions, steps) • review of critical features of procedural performance and standards of performance • learning and guidance through demonstration or application with explanations • repeated safe practice on performance of procedures with corrective feedback on how to avoid mistakes and improve steps of procedures • development of psychomotor skills
Assessment Strategies	• review standards of performance • examine situations and conditions for performance • perform procedures according to provided standards
Motor Skills	
Description	Executing physical and mental processes that lead to skilled movement
Example	Learning to move according to a model of performance, becoming proficient in certain types of movement skills
Instructional Strategies	• mental and physical models of the desired performance • verbal description of the steps in the performance • practice with kinesthetic and corrective feedback (coaching)

Assessment Strategies	• provided with situations and resources for performance of the skill(s), including checklists for success • perform the motor skill(s) (Checklists for success may come in a variety of formats.)

Instructional Level 3: Strategic Thinking

Metacognitive Thinking Strategies	
Description	Thinking about thinking; learning how to think using different methods; monitoring one's own thinking; planning in response to thinking patterns; responding to feedback, personal reflection, and evaluating effectiveness of one's actions
Example	Comparing and contrasting the validity of ideas; figuring out the type of thinking that will help to solve different kinds of problems, figuring out how mistakes were made in the process of thinking that led to a wrong conclusion
Instructional Strategies	• introduction and review of thinking strategies: steps, lists, strategies, prompts, or tips on how to think • review of conditions or context for applying different types of thinking strategies and steps; development of reading and learning strategies together with thinking strategies • encouragement of questioning of thinking processes, of self-evaluation, to get students to wonder why they are doing what they are doing • challenges to preexisting ideas, beliefs, thoughts, concepts, and misconceptions with paradoxes, dilemmas, perplexities, ethical perspectives, and behaviors • questions to prompt synonyms and examples of thinking strategies • demonstrations or examples of how to apply open-mindedness, responsibility for thinking, and seeking of accuracy • emphasis on persisting when answers are not apparent • guidance in formulating hypotheses; speculating on consequences, guessing, brainstorming; and discussing how students' thinking processes have worked for them • guidance in systematic inquiry and thinking independently while avoiding dead-ends and simplistic answers • practice in planning self-reflection and regulating self-monitoring of progress • lots of guided application, transfer, and elaboration with guided practice in new situations; gradual autonomous use of thinking skills
Assessment Strategies	• identify types of thinking strategies that would be best for different situations or problems • detect open- versus closed-mindedness, biases in thinking, responsible and irresponsible thinking processes, as well as inaccuracies in thinking or assumptions • analyze and evaluate their own thinking about specific situations or problems according to specific criteria • apply particular thinking strategies in specific situations
Insight	
Description	After a period of study and reflection, suddenly realizing the connections, patterns, or relevant cues between the different pieces, patterns, or elements in a way that leads to a solution or product

Example	Recognizing cues in social problem situations; suddenly seeing responsible choices by observation, reasoning, and applying scientific methods; suddenly figuring out a solution or pattern; suddenly seeing how a puzzle works or how aspects of a problem fit together
Instructional Strategies	• inquiry and discovery activities • challenging thinking situations with concrete data to manipulate • coaching to promote careful observation, analysis, description, and definition
Assessment Strategies	• make inferences or draw conclusions through inquiry, discovery, and manipulation of data or information • provide a rationale for each inference or conclusion
Critical Thinking, Analysis, Synthesis, & Evaluation	
Description	Reflecting and evaluating information, evidence, or situations; seeking accuracy and clarity; keeping an open mind; analyzing, inferring, and justifying through systematic reasoning; making decisions in complex situations by using criteria for judgments; detecting relationships, patterns, and errors; restraining impulsivity
Example	Learning to determine the validity of arguments; responding appropriately to others' feelings
Instructional Strategies	• information that conflicts with or challenges preexisting ideas, beliefs, concepts, and misconceptions • practice in defining and applying criteria for judgments, detecting mistakes in logic, calculations, procedures, "buggy algorithms," and other fallacies or contradictions, biases, or prejudices • practice in making inferences from observations and discussions; predicting from limited information; verifying statements through research, surveys, or other means • explanation of and practice in recognizing factors (such as culture, experience, preferences, desires, interests, passions and systematic thinking processes) that influence choice and interpretation • emphasis on recognizing and generating systematic proof, logic, and argument • practice in distinguishing relevant from irrelevant issues • practice in writing, telling, or discussing the formation of judgments, how and why present judgments differ from previously existing ideas, opinions or approaches
Assessment Strategies	• inquire, discover, and manipulate data and situations • evaluate information or situations by using analysis and research insight • provide rationales for evaluations

Instructional Level 4: Extended Thinking

Scientific Inquiry & Research	
Description	Searching and describing phenomena such as cause-and-effect relationships, correlations, probabilities, and axiomatic relationships; forming and testing hypotheses

Example	Constructing concepts by working with basic content and then observing what happens in a chemical reaction
Instructional Strategies	• review of knowledge level including process and methods of scientific inquiry and typical solution procedures • guidance in how to do systematic inquiry, think independently, and address dead ends or simplistic answers • explanations and examples of how to form hypotheses, speculations or consequences; guess, brainstorm, and discuss potential outcomes • hands-on activities to allow students to observe and explain experiences and results • constructivist approaches to learning (especially important in correcting misconceptions immune to traditional teaching)
Assessment Strategies	Conduct inquiry, speculate, form hypotheses, do research, and form conclusions from provided situations or problems
Problem Solving & Complex Rule Using	
Description	Using more than one rule or strategy to solve a complex problem; analyzing and evaluating complex problems or systems; predicting outcomes
Example	Forming predictions, inferences, logical endings, or conclusions
Instructional Strategies	• strengthening comprehension of related concepts, rules, principles, procedures, decision-making processes, and problem-solving strategies • teaching of systematic, broad problem-solving methods and models of decision making • teaching of thinking strategies • practice in reframing problems • challenging situations that create perplexity, state of doubt, difficulty to be overcome, paradoxes or dilemmas • presentation of problems that can be solved in a variety of ways • background knowledge for understanding problem situations • opportunities for students to share and discuss various approaches and strategies • practice in solving non-routine, complex problems • opportunities for students to explore, state, and restate questions, and to devise and/or explain methods and/or steps for approaching problem-solving processes • practice in solving different types of problems; starting with clearly structured problems and proceeding to more unstructured ones • practice in finding incompleteness, anomaly, trouble, inequities, contradictions and difficulty • questions to guide thinking in defining and clarifying problems, stating goals, observing and gathering information, formulating questions to clarify issues, and generating solutions • practice of problem-solving strategies and steps until they are fast, effortless and consistently applied (compare this strategy to psychomotor learning)
Assessment Strategies	• choose types of problem-solving strategies for *previously unseen* situations (Using previously seen situations will assess only the knowledge level.) • solve *previously unseen* structured and unstructured, simple and complex problems (Using previously seen problems will assess only the knowledge level.)

Creativity	
Description	Generating, inventing, visualizing, or reframing ideas, solutions, products, associations, analogies, relationships; finding or reframing problems and solutions; persevering; pushing limits of knowledge and skills; generating, trusting, and maintaining personal standards of evaluation
Example	Generating new ways to view and approach a product or solution for an old problem
Instructional Strategies	• use of models, metaphors, and analogies • unstructured problems, opportunities for intensive study, and expression of original ideas • freedom from formal evaluation with opportunities for ungraded, unevaluated creative performance and behavior • opportunities to confront questions with multiple answers • practice in turning a problem statement upside down or inside out • examples of creative applications • encouragement of novel approaches to situations • directions, examples, practice in brainstorming, and changing perceptual sets (such as reversing the statement of a problem) • activities to allow independent, individual study and approaches to problems or challenges • problem-solving competitions for individuals and teams
Assessment Strategies	• create re-statements of problems to turn problem descriptions "upside down" • provide new problems to study and resolve (These could be puzzles, dance performances, drama performances, or products to create or match particular functions and resources.) • provide situations requiring novel approaches

The following references were used for the analysis of instructional and assessment strategies for the different types of learning outcomes.

Attitudes: Gagné & Briggs, 1979; Gagné, Briggs, & Wager, 1988; Krathwohl, Masia, & Bloom, 1965; McCombs, 2003

Cognitive Strategies: Butyniec-Thomas & Weloshyn, 1997; Gagné, Briggs, & Wager, 1988; McREL, 1997; Osborn, Jones, & Stein, 1985; Wager, Polkinghorne, & Powley, 1992; McCombs, 2003

Comprehension: Crowl, Kaminisky, & Podell, 1997; Huot, 1995; McDavitt, 1994; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Montague & Knirk, n.d.

Concepts: Gagné, Briggs, & Wager, 1988; Harniss, Hollenbeck, Crawford, & Carnine, 1994; Martorella, 1982; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; 6-7; Maryland State Department of Education, 1990; McREL, 1997; Slavin, 1997; Wager, Polkinghorne, & Powley, 1992

Creativity: Crowl, Kaminisky & Podell, 1997; Fogarty & McTighe, 1993; Huot, 1995; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Maryland State Department of Education, 1990; McREL, 1997; Sternberg & Davidson, 1995

Critical Thinking, Analysis, Thinking & Evaluation: Bloom, 1956; Cotton, 1997; Crowl, Kaminsky, & Podell, 1997; Glaser, 1941; Ennis, 1989; Facione, 1998; Gagné, Briggs, & Wager, 1988; Haladyna, 1997; Huot, 1995; Jacobs, 1994; Kahneman, Slovic, & Tversky, 1982; Kauchak & Eggen, 1998; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Maryland State Department of Education, 1990; McDavitt, 1994; McREL, 1997; Schooler, Fallshore, & Fioro, 1995; Siowck-Lee, 1995

Insight: Kahneman, Slovic & Tversky, 1982; Maryland State Department of Education, 1990; Sternberg & Davidson, 1995

Metacognitive Strategies: Briggs & Wager, 1988; Clarke, 1990; Cotton, 1997; Crowl, Kaminsky, & Podell, 1997; Darmier, 1995; Gagné, Kauchak, & Eggen, 1998; Kauchak & Eggen, 1998; Lubart & Sternberg, 1995; Maryland State Department of Education, 1990; Marzano, 1993; Marzano et al, 1988; McCombs, 2003; McREL, 1997; Osborn, Jones & Stein, 1985; Patrick, 1986; Pogrow, 1990

Multiple Intelligences: Crowl, Kaminisky, & Podell, 1997; Kauchak & Eggen, 1998; Kirby & Kuykendall, 1991; McPeck, 1990; Sternberg, 1998

Motor Skills: Wager, Polkinghorne, & Powley, 1992

Problem Solving & Complex Rule Using: Clarke, 1990; Crowl, Kaminsky, & Podell, 1997; Gagné, 1965; Gagné, Briggs, & Wager, 1988; Glaser, 1941; Marzano, 1990; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Maryland State Department of Education, 1990; Wager, Polkinghorne, & Powley, 1992

Procedural Knowledge: Crowl, Kaminisky, & Podell, 1997; Huot, 1995; Mandl, Schnotz, & Tergan, 1984; McREL, 1997; Wager, Polkinghorne, & Powley, 1992

Rule Using, Applying Principles, Applying Procedures: Gagné, Briggs, & Wager, 1988; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; McDavitt, 1994; McREL, 1997

Scientific Inquiry & Research: Crowl, Kaminsky, & Podell, 1997; Davitt, 1993; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; Maryland State Department of Education, 1990; McREL, 1997; Mestre, 2001

Verbal Information: Crowl, Kaminisky, & Podell, 1997; Martorella, 1982; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988; McREL, 1997; Montague & Knirk, n.d.; Wager, Polkinghorne, & Powley, 1992

Assessment

Although "cognitive research indicates that knowing the separate parts is not equivalent to knowing the whole," (Mestre, 2001, p. 9) materials and tests tend to be fragmented and decontextualized. Teachers fall into the trap of "teaching to the test" and students learn how to "get the right answer," which means instructional time is spent learning "a collection of definitions and isolated bits of information" rather than how to analyze and use knowledge for solving problems (p. 9). In math and science, achievement and accountability tests tend to measure "recall of routine factual knowledge" rather than focus on problem solving.

Yet, the power of assessment to facilitate "thinking, reasoning, and problem solving is well-documented and indisputable" (Black & William; Glaser & Silver; National Research Council; and Shepard—all cited in Bass & Glaser, 2004, p. 1). Features of informative assessments that improve teaching and learning include:

- Assessing to check student progress (Bass & Glaser, 2004, p.5)—including assessments within units as well as at end of units (p. 11)
- Using rubrics that "make students' thinking explicit and highlight areas for growth" (Bass & Glaser, p. 5)—rubrics are guides for scoring that distinguish different qualities of performance (Arter & McTighe cited in Bass & Glaser, 2004, p. 8)
- Align rubrics with instructional situations (Bass & Glaser, 2004, p. 8)
- Determine how assessment results can be used to improve student performance (Bass & Glaser, 2004, p. 13)

Bass and Glaser (2004, pp. 14-15) include citations from a number of studies about assessment and the impact of self-assessments on learning. From a review and analysis of those studies, they set forth three major principles that "make assessments informative to students" (p. 14):

- *Models of competence* that give clear standards for what the student is expected to be able to do and how well the student is expected to do it
- *Graphical tools to track progress* so that students can visualize their progress over a time period
- *Structured opportunities for reflection and revision* so that students have a structure that guides them in how to examine and make corrections in their performances

Evaluation Process

The term *integrity* describes the purpose and outcomes for Florida's process of evaluation and selection of materials. Members of instructional materials committees are expected to perform their duties with a degree of *trustworthiness* and *incorruptibility* that prevents unfairness and dishonesty. Procedures for statewide adoption have been designed to support this integrity.

But lobbying influences from any source can undermine the integrity of the whole system. Because of this, committee members must be diligent in following the recommended procedures and in refusing inappropriate discussion of instructional materials. If concerns or doubts arise about any of Florida's evaluation procedures, members must make sure to check with other officials about the best course of action.

The requirements of defined procedures specify how to accomplish the evaluation of instructional materials; however, neither Florida Statutes nor the Department of Education can fully prescribe all the actions and possible influences that may introduce unfairness, biases, or dishonesty. It is up to individual committee members to recognize the possible influences from *any outside source*, not just publishers.

The following policies and procedures have been approved by the Commissioner of Education pursuant to Sections 1003.42, 1006.29, 1006.30, 1006.31, 1006.31, 1006.32, 1006.33, 1006.34, and 1006.38, Florida Statutes, for use by State Instructional Materials Committees that evaluate the instructional materials and publishers who submit instructional materials for adoption.

In Florida, specific courses within selected subject areas are called for adoption on a rotating basis, usually every six years. Florida adopts instructional materials for those specific courses. Subject areas for the current adoption year and the adoption schedule are posted on the Florida Department of Education Instructional Materials Web site.

One to two years prior to each adoption, the Florida Department of Education publishes the Instructional Materials Specifications for the subjects to be adopted. These specifications outline the courses for which materials are being sought, as well as the standards that those materials are expected to meet. Specifications can be downloaded from the Florida Department of Education Instructional Materials Web site.

Components of Evaluation

For purposes of state adoption, the following definitions apply:

"Instructional materials" are defined as items having intellectual content that by design serve as a major tool for assisting in the instruction of a subject or course. These items may be available in bound, unbound, kit, or package form and may consist of hardback or softback textbooks, consumables, learning laboratories, manipulatives, electronic media, and computer courseware

or software. The term does not include electronic or computer hardware even if such hardware is bundled with software or other electronic media, nor does it include equipment or supplies.

"Major tool" refers to materials that provide instructional content and student learning activities for the Sunshine State Standards, state-intended outcomes, and course objectives for reading, language arts, literature, math, science, social studies, physical education, health, world languages, visual arts, and performing arts;

Materials that provide instructional content and student learning activities for each of the intended outcomes and/or student performance standards of the Career and Technical Education Curriculum Frameworks; and

Materials that provide instructional content and student learning activities for the course objectives as outlined by the appropriate organizations for Advanced Placement, International Baccalaureate, and Advanced International Certificate of Education.

Florida's instructional materials adoption program covers only materials that serve as the major tool and priced ancillaries for a particular subject or course.

"Ancillaries" are those items that were designed to work with a specific major tool.

"Supplementary" materials are defined as supporting materials that do not qualify as the major tool, and are not designed to accompany the specific major tool with which they were submitted, but could be used with any publisher's materials. Florida does not have a process for the adoption of supplementary materials.

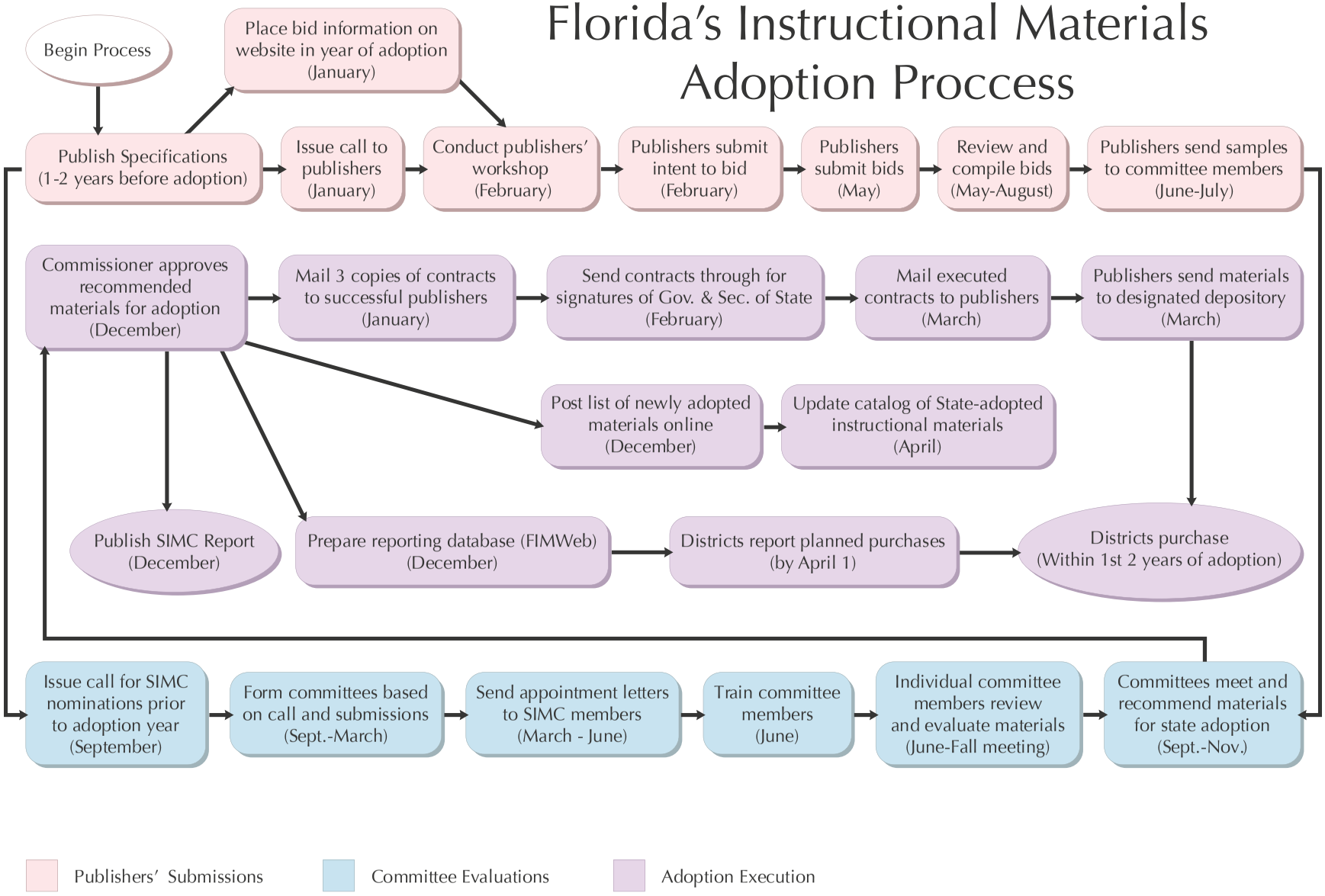
Any materials that are considered during adoption of the major tool, regardless of price, are expected to be provided upon award of the contract.

Schedule

Florida's state adoption process begins with the specifications sent to publishers.

The orchestration of everyone's involvement in the selection of instructional materials begins with a schedule of events and activities. The following flow chart outlines the adoption process and provides an *approximate schedule* of major events. Specific dates are announced annually and vary somewhat from year to year.

Florida's Instructional Materials Adoption Proccess



Basic Responsibilities

State instructional materials committees produce the recommendations that go to the Commissioner of Education for instructional materials adoption. Committee membership requirements are set forth in Florida Statutes and must be met to assure representativeness of each committee and compliance with time limits on appointments.

Roles and Activities

State Committees. State committee members conduct *independent* reviews to complete their evaluations of the materials. The state committee members then meet to discuss their findings, hear publisher presentations, and review other information. At this time, they *vote* "for" or "against" recommending state adoption of each set of materials.

Commissioner of Education. Recommendations from the state committees go to the Florida Commissioner of Education, who makes the final selections from the materials that have been recommended. These selections then appear in the *Florida Catalog of Instructional Materials*.

The following chart shows how the major roles of the state committees fit with the roles of the Department of Education and publishers. The text that follows the chart explains more about each role.

Department of Educatio n

- Announce subject areas for adoption years.
- Announce meeting dates and deadlines.
- Specify format for submissions.
- Specify evaluation criteria.
- Provide evaluation and reporting forms.
- Conduct publishers' workshop.
- Provide committee training.
- Facilitate state committee meetings.
- Compile state committee recommendations.
- Develop catalog of adopted materials.

Publishers

- Review adoption schedule.
- Review specifications.
- Decide what materials to submit.
- Loan samples to committees.
- Submit publisher questionnaire to committee members.
- Submit correlation charts.
- Submit sample checklist.
- Submit bids, deposit, and other documents.
- Give committee meeting presentations.

State Committees

- Committee members are trained.
- Committee members receive materials to be evaluated.
- Individual committee members review and evaluate materials.
- Committee meets to hear presentations, ask questions, discuss reviews and concerns, and vote.
- Results are submitted to the Department of Education.
- Follow publishers' directions for return of materials.

Department of Education

The Department of Education coordinates the adoption schedules, manages the development of the instructional materials specifications for each subject area, and establishes the evaluation forms, procedures, and training. The Department of Education is responsible for the state committee adoption meetings. The Department of Education compiles the results from the state committees into one report and submits the report to the Commissioner of Education.

The Department of Education oversees the process of the adoption program in several phases.

Phase 1: Developing bid specifications known *as instructional materials specifications* for each subject or course.

Phase 2: Announcing adoption schedules, extending invitations to bid, and making available to publishers the instructional materials specifications and procedures for submissions and evaluation.

Phase 3: Calling for nominations and forming the state instructional materials committee.

Phase 4: Receiving and reviewing bids and information from publishers that are making submissions to be considered for adoption.

Phase 5: Providing information, technical assistance, and training to support the instructional materials evaluation process.

Phase 6: Planning and managing the state adoption meetings.

Phase 7: Compiling the evaluation results, preparing a report for final recommendations to the Commissioner of Education, and supporting the contract-award process.

Phase 8: Monitoring compliance with contract provisions through ongoing communication with districts, publishers, and others, such as the Department of Legal Affairs.

Publishers

Publishers receive information about schedules for adoption from Florida, as well as written specifications that detail exactly what Florida desires in a subject area submission of materials.

Publishers carefully examine these specifications for the criteria that Florida uses to evaluate the materials. These criteria include a detailed focus on content as well as other criteria for effective instructional materials. Florida also requires a correlation chart in which the publisher shows exactly where each curriculum standard and benchmark has been addressed in the publishers' submissions.

After reviewing and evaluating subject-area specifications, publishers make a decision about what to submit to Florida.

Publishers have the responsibilities of completing all required forms and loaning submissions of materials, with correlations and other requirements, according to the schedule provided from the Department of Education. This schedule requires strict compliance and includes the date and hour by which certain steps must be completed.

Information and materials from publishers are compared to the criteria for evaluation. To provide information and materials for Florida, publishers must

__ 1. Review Florida's instructional materials specifications for subjects, courses, and grade levels.

__ 2. Decide to submit materials for Florida to *consider* adopting.

__ 3. Submit sealed bids, including bid deposit.

__ 4. Submit the "Publisher Registration."

__ 5. Submit the "Publishers Affidavit" signed and notarized.

__ 6. Provide the publisher's warranty statement about the physical specifications and standards for textbooks or electronic media submitted as the major tool.

__ 7. Provide detailed information in the Publisher's Questionnaire for *each* submission, including

- Credentials of authors
- Special nature and/or desired approach to subject/course
- Relationship between instructional components
- Hardware/equipment needs
- Suggested instructional time
- Intended students, intended grade levels
- Training and/or in-service support
- Licensing policies and agreements for use of electronic media
- Where materials have been used
- How the instructional materials satisfy each of the criteria statements

— 8. Provide detailed correlations to show where the instructional content correlates ("in-depth" or "mentioned") with the outcomes, benchmarks, and standards of the curriculum/course/subject for which the materials are submitted.

— 9. Submit complete sets of the instructional materials in the quantities required for the state committees and fall adoption meetings according to instructions provided by the Department of Education.

— 10. Decide whether or not to make presentations at designated committee meetings.

— 11. Enter into contracts with the Department of Education, which include assurances of the necessary quality and quantity of materials, if recommended for adoption.

Committee Membership

The Department of Education receives nominations from school districts, professional and educational associations, and civic organizations and makes appointments to the committee.

Individuals who are nominated should be qualified and willing to serve. For example, teachers of the year at the school, district, regional, or state level are encouraged to serve on instructional materials committees. Qualifications and willingness to serve apply equally to other teachers, lay citizens, supervisors, or school board members who may be nominated by district superintendents, Department of Education program specialists, or civic and professional organizations.

Once appointed, training is provided by the Instructional Materials Staff of the Department of Education during June and July of the adoption year. The program is structured to assist committee members in developing the skills necessary to make valid, culturally sensitive, and objective decisions regarding the content and rigor of instructional materials. All persons serving on instructional materials committees must complete the training program prior to beginning the review and selection process.

By mid-July, participating publishers send samples of their materials to each member. Members then review and evaluate each submission, using the information and procedures introduced in the training, as well as their own expertise. In the fall, each subject-area committee needs to discuss these evaluations and to recommend which materials should be adopted in Florida.

Specific requirements for membership on the state committee are summarized in the following chart.

State Committee

- ❑ Two ex-officio members (the Commissioner of Education and a representative from the Department of Education).
- ❑ Ten members as follows:
  - ✓ 5 classroom teachers
  - ✓ 2 supervisors of teachers
  - ✓ 1 school board member
  - ✓ 2 lay citizens

The requirements for membership include the following:

Affidavit: Each member must sign an affidavit to the effect that he/she will faithfully discharge the duties imposed as a committee member and that he/she has no interest with any publishing company.

Diversity: Committees are expected to reflect the diversity of Florida's population and to have the capacity/expertise to address the broad racial, ethnic, socioeconomic and cultural diversity of students in Florida's schools.

Teachers: Committees must include the representation of teachers. Teachers must be actively engaged in teaching or in the supervision of teaching in the public elementary, middle, or high schools. Teachers serving on instructional materials committees must be certified in an area directly related to the academic area or level being considered for adoption and must be classroom teachers representative of the major field and levels in which instructional materials are used in the public schools of Florida.

Lay citizens: Committees must include representation of lay citizens. Lay citizens represent the community. They may be parents, community members, or retired educators having an interest in education but who are not currently professionally associated with education. They must not work for a district school board, private school, or community college.

Basic responsibilities: Members of committees have the following basic responsibilities:

- Members must faithfully discharge their duties, avoid conflicts of interest, and refrain from seeking or accepting undue influence from publishers;
- Members must complete the Department of Education training program prior to reviewing and evaluating instructional materials; and
- Members must review and evaluate submitted instructional materials.

Each committee shall present a written report of its findings to the Commissioner which shall be made available to the public.

Restrictions: Certain restrictions also apply to membership on committees.

- Members of any instructional materials committees may not participate in publisher-sponsored pilot programs for a course/subject being considered for adoption by the member's committee.
- Members of any instructional materials committees may not participate in publisher-sponsored events.
- Members of any state instructional materials committee must have no interest in any publishing or manufacturing organization that produces or sells instructional materials designed for use in the public schools.
- Members of any state instructional materials committee must in no way be connected to the distribution of the instructional materials sold by a publishing or manufacturing organization designed for use in the public schools.
- Members of any state instructional materials committee must not accept any emolument or promise of future reward of any kind from any publisher or manufacturer of instructional materials or his or her agent or anyone interested in, or intending to bias his or her judgment in any way in, the selection of any materials to be adopted.
- Members of any state instructional materials committee must restrict discussion of matters relating to instructional materials submitted for adoption with any agent of a publisher or manufacturer of instructional materials, either directly or indirectly, to the period when the committee has been called into session for the purpose of evaluating instructional materials

submitted for adoption.

- A member of a state instructional materials committee may also serve on a district committee but cannot attend a publisher presentation at the district level prior to the state's fall adoption meeting.
- Members cannot serve perpetually—there are time limits on their appointments.
- Anyone who violates the law governing prohibited acts can be charged with a second-degree misdemeanor, and removed from official positions.

Committee Responsibilities

Members of committees complete independent reviews of materials without consulting each other. Each member uses the evaluation form as an independent *worksheet*. The committee members do not discuss any issues until the annual *state committee meeting*.

State committee members fulfill the following duties.

__ 1. Meet at the call of the Commissioner of Education.

__ 2. Elect a chair, vice chair, and recorder

Chair

- Conducts meetings and guides the committee to completion of its tasks.
- Offers equal time to all participants.
- Considers a variety of approaches and solutions before deciding on the final one.
- Allows for ownership of ideas by committee members.

Vice Chair—takes the place of the chairperson, if necessary.

Recorder— records decisions of committee on Committee Questionnaire at fall meeting and reads questionnaire back to committee before final vote.

__ 3. Complete training for evaluation of instructional materials.

__ 4. Review the materials for each submission.

- submitted instructional materials
- instructional materials specifications
- evaluation forms and instructions
- publisher's questionnaire
- correlations

__ 5. Review the instructional materials using the *State Committee Evaluation Form* for each submission independently, without consultation with other members.

__ 6. Prepare for participation in the committee meetings, where a single state committee convenes at any given time.

- Refrain from discussing committee business except during official committee meetings.
- Prepare or consider the types of questions to ask of publishers at the state committee meeting. The presentation of submissions will be made by the publishers, manufacturers, or their representatives. Presentations are not required, and a publisher's decision to decline the opportunity shall not disqualify submitted materials from consideration. The committee may ask questions of the publishers at the close of their individual presentations (Section 1006.34(1), Florida Statutes).
- Prepare or consider the types of questions to ask of others at the state meeting. A designated time will be set to hear from the general public regarding instructional materials being considered for adoption. Members of the general public or one representative of each special-interest group who wish to submit written comments should do so, at least 15 days prior to the committee's hearing date. Written comments should be addressed to the Instructional Materials Office, Department of Education, and must contain specific references with appropriate page numbers of the materials. Each speaker must furnish an outline and a brief, written explanation of concerns and recommendations, also with specific references and page numbers. The publisher, manufacturer, or representatives may respond at the committee meeting.
- Forward unsolicited correspondence directly related to the adoption to the Department of Education for dissemination to other committee members as appropriate.

__ 7. Attend the state instructional materials adoption committee meetings.

- Listen to presentations by publishers, special-interest groups, and private citizens and ask questions for clarification.
- Review and discuss information gathered in other presentations, such as student use of materials, findings of professional organizations, strengths and weaknesses identified in district reports and confirmed in independent reviews, and qualities and concerns about satisfaction of criteria. Discussion of individual and/or collective evaluations by committee members shall include all factors pursuant to Chapter 1006 of the Florida Statutes.
- Record committee decisions on major issues and overall evaluation of each submission according to content, presentation, and learning.
- Vote *for* or *against* recommending each submission for adoption.
- Submit a list of recommendations to the Department of Education.

  Note: State policy requires a two-thirds affirmative vote of members present to recommend a submission for adoption.

  When state committees have met and made their recommendations, a report is prepared and forwarded to the Commissioner of Education. The Commissioner of Education makes the final decision as to which of the recommended materials are adopted.

__ 8. Return materials as directed by publishers.

Appendix A

Major Priorities for Instructional Materials: Content, Presentation, and Learning

The priorities as described in this specification document were developed from research findings about what makes instructional materials effective. These priorities have undergone review by individuals who have served on state and district committees, by curriculum specialists, by instructional designers, by evaluation specialists, and by administrators of the statewide adoption system.

Instructional materials must be effective in three major priority areas: content, presentation, and learning. The following sections describe essential features for each of these priority areas. These features generally apply to all formats of instructional materials, whether print or other media or multiple media formats.

Related *Florida Statutes* are listed in italics with major criteria within the priority areas. These statutes include Title XLVIII, accessible at http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Index&Title_Request=XLVIII#TitleXLVIII :

Chapter 1006 SUPPORT FOR LEARNING, Part I PUBLIC K-12 EDUCATION SUPPORT FOR LEARNING AND STUDENT SERVICES, Section F. Instructional Materials for K-12 Public Education

Chapter 1003 PUBLIC K-12 EDUCATION, Part IV PUBLIC K-12 EDUCATIONAL INSTRUCTION

Evaluation forms are available as follows:

State Committee Evaluation Form
http://www.fldoe.org/bii/instruct_mat/pdf/evaluation-form.pdf

State Committee Questionnaire
http://www.fldoe.org/bii/instruct_mat/pdf/ccq.pdf

The Florida Department of Education, Bureau of Curriculum and Instruction, provides an overview of Florida's adoption process, the adoption cycle, and related information at http://www.fldoe.org/bii/instruct_mat/.

Content

Some features of content coverage have received progressively more attention over the past decade. These features include:

A. ALIGNMENT WITH CURRICULUM REQUIREMENTS *Florida Statutes 1006.34(2)(a)(b); 1006.38(3)(b); 1006.31(4)*
B. LEVEL OF TREATMENT OF CONTENT *Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b)*
C. EXPERTISE FOR CONTENT DEVELOPMENT *Florida Statutes 1006.38(15)*
D. ACCURACY OF CONTENT *Florida Statutes 1006.38(8); 1006.31(4)(e); 1006.35*
E. CURRENTNESS OF CONTENT *Florida Statutes 1006.38(8); 1006.(4)(e)*
F. AUTHENTICITY OF CONTENT *Florida Statutes 1006.31(4)(e); 1006.34(2)(b); 1003.42*
G. MULTICULTURAL REPRESENTATION *Florida Statutes 1003.42; 1006.31(4)(a);* 1006.34(2)(b)
H. HUMANITY AND COMPASSION *Florida Statutes 1003.42; 1006.31(4)(c); 1006.34(2)(b)*

The following sections describe the content features expected for each of these priority areas.

A. ALIGNMENT WITH CURRICULUM REQUIREMENTS

Content must align with the state's standards and benchmarks and course descriptions for the subject area.

See Florida Statutes 1006.34(2)(a)(b); 1006.38(3)(b); 1006.31(4)

Correlations. Publishers are expected to provide correlation charts in the provided form to show exactly where and to what extent (mentioned or in-depth) the instructional materials cover the Sunshine State Standards and benchmarks outlined in the course descriptions.

Scope. The content should address Florida's required curriculum standards and benchmarks for the subject, grade level, and learning outcomes, including thinking and learning skills.

Completeness. The content of the major tool should be complete enough to stand on its own. To be useful for classroom instruction, instructional materials must be adaptable to the instructional goals and course outlines for individual school districts, as well as the state standards and benchmarks. Content should have no major omissions in the required content coverage. They may include concepts and topics that enrich and extend learning, but should be free of unrelated facts and information that would detract from achievement of Florida's specified Course Descriptions and Sunshine State Standards and benchmarks.

B. LEVEL OF TREATMENT OF CONTENT

The level of complexity or difficulty of content must be appropriate for the standards and benchmarks, student abilities, grade level, and time periods allowed for teaching.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b)

Objectives. Content should be simple, complex, technical, or nontechnical enough for the intended objectives.

Students. Content should be developmentally appropriate for the age and maturity level of the intended students. It should contain sufficient details for students to understand the significance of the information and to engage in reflection and discussion.

Time. The level of complexity or difficulty of content also should allow for its coverage during the time periods available for teaching the subject.

C. EXPERTISE FOR CONTENT DEVELOPMENT

Expertise in the content area and in education of the intended students must be reflected in the authors, reviewers, and sources that contributed to the development of the materials.

See Florida Statutes 1006.38(15)

Authorship. The authors, consultants, and reviewers must have actually contributed to the development of the instructional materials and should have credentials that reflect expertise in the subject area, course, course category, grade level, pedagogy, education, teaching, or classroom instruction. Qualifications may include expertise in educational psychology or instructional design.

Sources. Primary and secondary sources should reflect expert information for the subject, such as relevant data from research journals and other recognized scientific sources. The types of sources considered appropriate will vary with the particular subject area.

D. ACCURACY OF CONTENT

Content must be accurate in historical context and contemporary facts and concepts.

See Florida Statutes 1006.38(8); 1006.31(4)(e); 1006.35.

Objectivity. Content that is included in the materials should accurately represent the domain of knowledge and events. It should be factual and objective. It should be free of mistakes, errors, inconsistencies, contradictions within itself, and biases of interpretation. It should be free of the biased selection of information. Materials should distinguish between facts and possible interpretations or opinions expressed about factual information. Visuals or other elements of instruction should contribute to the accuracy of text or narrative.

Representativeness. The selection of content should not misrepresent the domain of knowledge and events. It should include the generally accepted and prevalent theories, major concepts, laws, standards, and models used within the discipline of the subject area.

Correctness. Presentation of content should be free of typographical and visual errors. It should include correct grammar, spelling, linguistics, terminology, definitions, descriptions, visuals, graphs, sounds, videos, and all other components of the instructional materials.

E. CURRENTNESS OF CONTENT

Content must be up to date for the academic discipline and the context in which the content is presented.

See Florida Statutes 1006.38(8); 1006.(4)(e).

Dates or editions. Copyright dates for photographs and other materials and editions should suggest sufficient currentness of content. Copyright dates and editions serve as indicators of currentness. However, neither the copyright date nor the edition guarantees currentness. Subsequent editions should reflect more up-to-date information than earlier editions**.** Informed examination of the text, narrative, and visuals contained in the materials provides the most direct information about currentness of the materials.

Context. Text or narrative, visuals, photographs, and other features should reflect the time periods appropriate for the objectives and the intended learners.

- Sometimes, context should be current. For example, a photograph used to show stages of human growth and development will be more relevant when the clothing, hairstyles, and activities reflect present-day styles.
- Sometimes, context should be historical. For example, illustrations and photographs of historical events should reflect the historical time period.
- Sometimes, context should be both current and historical. For example, historic images alongside modern ones would convey changes in styles over time.
- At all times, the context should be relevant to the learners, to the curriculum frameworks, to the standards and benchmarks, and to the concept presented.

F. AUTHENTICITY OF CONTENT

Content should include problem-centered connections to life in a context that is meaningful to students.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(b); 1003.42.

Life connections. Instructional materials should include connections to the student's life situations to make the content meaningful. Students might be expected to deal with time constraints, consider risks and trade-offs in decision making, and work with teams. Connections may be made to situations of daily home life, careers, vocation, community events and services, and leisure or recreation.

Interdisciplinary treatment. Instructional materials also should include interdisciplinary connections to make content meaningful. Examples of situations that connect a variety of subject areas include building projects, playing sports, retrieving information or objects, balancing budgets, creating products, and researching information. In addition to subject-area connections, instructional materials should connect the course or course category to other disciplines and student experiences.

Examples of approaches to interdisciplinary connections include:

- explanations and activities for using skills and knowledge from other academic disciplines
- assignments that require students to relate learning from other disciplines rather than to isolated knowledge or skills
- the focus on common themes across several subject areas (infusion, parallel, transdisciplinary, or multidisciplinary instruction)

G. MULTICULTURAL REPRESENTATION

Portrayal of gender, ethnicity, age, work situations, and various social groups must include multicultural fairness and advocacy.

See Florida Statutes 1003.42; 1006.31(4)(a); 1006.34(2)(b).

Multicultural fairness. Through balanced representation of cultures and groups in multiple settings, occupations, careers, and lifestyles, the materials should support equal opportunity without regard to age, color, gender, disability, national origin, race, or religion. What matters most is not the number of pages devoted to diversity, equity, or work roles, but the substance of what is stated and portrayed. For this reason, it can be misleading to count the number of pages or illustrations devoted to a social issue or group. It is more important to focus on the integration of social diversity throughout a set of instructional materials.

In addition to balanced representations, the portrayal of individuals and situations must exclude biases and stereotypes. These portrayals must promote an understanding and appreciation of the importance and contributions of diverse cultures and heritage.

Multicultural advocacy. The understanding and appreciation of multiple cultures extends beyond fair representation. It involves embracing a multicultural context, not just through pictures, but through information about ways to honor differences and deal with conflicts, promote a positive

self-image for members of all groups, and provide for the development of healthy attitudes and values.

Effective treatment of multicultural issues requires consideration of the age and ability levels of students and whether or not it is appropriate to include multicultural issues in the study of a particular topic, such as the memorization of a formula or equation. Overall, however, materials should reflect both multicultural fairness and advocacy.

H. HUMANITY AND COMPASSION

Portrayal of the appropriate care and treatment of people and animals must include compassion, sympathy, and consideration of their needs and values and exclude hard-core pornography and inhumane treatment.

See Florida Statutes 1003.42; 1006.31(4)(c); 1006.34(2)(b).

Inclusion of compassion. When providing examples in narrative or visuals, materials sometimes depict the care and treatment of people and animals. Generally, this means showing in some way a measure of compassion, sympathy, or consideration of their needs and feelings.

Exclusion of inhumanity. In the context of personal and family values, Florida expressly prohibits material containing *hard-core pornography*. In addition, although the definition of *inhumane treatment* can sometimes appear to be controversial, as in science research, there is general agreement that instructional materials should not advocate any form of inhumane treatment.

As with the evaluation of multicultural representation, it is important to consider the context of the subject and the age and abilities of the students.

Presentation

Features of presentation affect the practical usefulness of materials and the ease of finding and understanding content. These features include:

A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES *Florida Statutes 1006.29(4); 1006.34(2)(a); 1006.34(2)(b)*
B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS *Florida Statutes 1006.29(4); 1006.34(2)(b)*
C. ORGANIZATION OF INSTRUCTIONAL MATERIALS *Florida Statutes 1006.34(2)(a); 1006.34(2)(b)*
D. READABILITY OF INSTRUCTIONAL MATERIALS *Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b)*
E. PACING OF CONTENT *Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b)*
F. EASE OF USE OF MATERIALS *Florida Statutes 1006.29(4); 1006.38(3)(a); 1006.34(2)(a); 1006.34(2)(b); 1006.38(5); 1006.38(6)(7)(8)(9)*

The following sections describe the presentation features expected for each of these areas.

A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES

Resources must be complete enough to address the targeted learning outcomes without requiring the teacher to prepare additional teaching materials for the course.

See Florida Statutes 1006.29(4); 1006.34(2)(a); 1006.34(2)(b).

Materials should contain support for students in completing instructional activities and assessments and for teachers in implementing all of the instructional elements. A variety of components can accomplish this purpose. Typically, materials will include test items, study guides, outlines and strategies for teaching, media supplements, learning activities, and projects.

The major components generally expected for student and teacher resources are listed below.

Student resources. Student materials typically include the major text or program with text or narration, visuals, assignments, and assessments. Formats may include print, audio, visual, computer, or other media such as CDs, DVDs, PowerPoint® presentations, or software adaptable for interactive whiteboards.

Effective instructional materials generally integrate the use of reference aids (e.g., index, glossary, maps, bibliography, graphic organizers, and pictures) with the topic being studied. Items that guide students through materials might include clearly labeled materials, directions and explanations, and assignments with menus of choices.

Review and practice activities might include participation activities such as simulations, role-playing situations, investigations, and hands-on practice assignments. Review activities might include self-checks or quizzes. Formats might include worksheets, workbooks, journals, lab books, lab logs, charts, or maps. Feedback might be in the form of answer keys in student materials or in teacher materials.

Review works best as a logical extension of content, goals, objectives, and lessons, with increased similarity to real-life situations. Review activities should require students to recall or apply previously taught knowledge and skills. Frequent short reviews over time or space improve learning more than a concentrated review. Assignments and stages of small practice improve speed and accuracy.

Other components might include enrichment and remediation activities, additional resources, and tests and assessment tools either in the student materials or in the teacher's guide or edition.

Teacher resources. Teacher materials typically include a teacher's edition with the annotated student text and copies of ancillary written materials with answer keys, worksheets, tests, diagrams, non-consumables, as well as consumables, etc., so that the teacher has to use only one guide. In-service training, workshops, and consulting services should be made available by publishers to support teachers in implementing instructional materials. Professional development is essential to the success of any program, especially when a program contains non-traditional elements. Publishers should clearly indicate the recommended amount and types of professional development they will provide, and they should work with districts and schools to ensure that teachers receive the support they need. The materials for the teacher should support continued teacher learning.

Support, guidelines, resources, or features such as the ones described below should be available to help teachers effectively implement materials in classroom and school settings.

- **Components and materials are easy to use.** Examples include clearance, license, or agreement for copying and use of materials; clear description and accurate directions for use of required equipment, facilities, resources, and environment; clearly labeled grade, lesson, content, and other information to identify components; correct specifications for making instructional media and electronic programs work effectively.
- **Materials support lesson planning, teaching, and learning.** Examples include overview of components and objectives; background for lectures and discussions; technical terminology, and reinforcement and review strategies; scope-and-sequence chart for activities and planning; sample lesson plans; suggestions for individualized study, small-group and large-group presentations and discussions, school-to-work activities, field or laboratory experiences, safety procedures, and other extension activities; suggestions for integrating themes

across the subject area or course curriculum and forming connections to other disciplines; and suggestions for parental and community involvement.

- **Suggestions are provided for adapting instruction for varying needs.** Examples include alternative approaches to teaching, pacing, and options for varied delivery of instruction such as media, tools, equipment, and emerging technology; strategies for engaging all students, such as open-ended questions to stimulate thinking, journals, hands-on investigations, explorations, and multi-sensory approaches; suggestions for addressing common student difficulties or adapting to multiple learning styles; and alternative reteaching, enrichment, and remediation strategies.
- **Guidelines and resources are provided on how to implement and evaluate instruction.** Examples include answers to work assignments, practice activities, and tests; sample projects or research results; suggestions for using learning tasks for classroom assessment; guidelines for alternative assessments, such as sample checklists, rubrics, peer or performance assessments, and portfolios.
- **Resources are provided to use in classroom activities.** Examples include technology resources; lists of resources, Web links, and references; reading strategies; materials for displays or photocopies; classroom management strategies and documentation on how to manage the entire instructional program; and in-service workshops or consultation support from the publisher.

B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS

All components of an instructional package must align with each other, as well as with the curriculum.

See Florida Statutes 1006.29(4); 1006.34(2)(b).

All components of an instructional package—teacher's edition and materials, student's edition and materials, workbook, all ancillary materials—must be integrated and interdependent and must correspond with each other. For example, support materials in the teacher's edition should align with student activities or assignments. They must match in content and progression of instructional activities.

C. ORGANIZATION OF INSTRUCTIONAL MATERIALS

The structure and format of materials must have enough order and clarity to allow students and teachers to access content and explicitly identify ideas and sequences.

See Florida Statutes 1006.34(2)(a); 1006.34(2)(b).

Providing an explicit and teachable structure can double the amount of information remembered. Clear organization allows students and teachers to discriminate important pieces of information through skimming, reading, or browsing.

Clear organization may be accomplished through a combination of features, but generally not through one feature alone.

Access to content. Some features help in searching and locating information, such as a table of contents; content scope-and-sequence chart; menu or map of content; directions on how to locate information or complete assignments; an index for quick reference; goals and/or objectives, outlines, lists, or checklists for major sections; bibliographies and lists of resources; glossaries for quick access to major terms; introductions, key concepts and themes, visual cues, illustrations, labeled examples, and labeled reviews or summaries.

Visible structure and format. At-a-glance features should signal the organization of content. The following features are desirable:

- chapter or unit titles and/or frames; headings and subheadings;
- typographic cues such as bold, italics, or changes in size of type;
- divisions of content such as borders, boxes, circles, highlighting, visual signposts, icons, or color cues;
- diagrams, labels, and visuals placed near the related content; and numbering of pages and other components.

Objectives or a content outline may serve a similar purpose by introducing main ideas, providing guideposts to use in searching for key information, or serving as a checklist for self-assessment.

Certain types of brief narrative sections also contribute to clear organization. For example, the statement of a clear purpose with content organized around main ideas, principles, concepts, and logical relationships supports the unity and flow of information. Introductions also play a major role when they include anchoring ideas, a list of key points, or conceptual schemes such as metaphors. Summaries also can assist students in understanding the logical order of topics presented.

Logical organization. The pattern of organization of the content should be consistent and logical for the type of subject or topic. Patterns of organization may include compare and contrast, time sequence, cause-effect or problem-solution-effect, concrete-to-abstract, introduction-review-extension (spiral structure), simple-to-complex, whole-part or part-whole, generalization-examples-review-practice, and conflict-inside view-structure.

D. READABILITY OF INSTRUCTIONAL MATERIALS

Narrative and visuals should engage students in reading or listening as well as in understanding the content at a level appropriate to the students' abilities.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b).

Language style. Language style and visual features can influence the readability of materials. Yet, a popular tool for assessing readability has been the use of a *readability formula* of one type or another. These formulas tend to focus only on a few *countable* characteristics of language style such as the length of words, sentences, and/or paragraphs.

Other features are more important in establishing the readability of instructional materials, such as:

- organized, coherent text
- language and concepts familiar to the student
- language that clarifies, simplifies, and explains information
- transition words such as "yet," "also," "next," "for example," "moreover," or "however"
- other phrases that create logical connections
- words with concrete and specific images
- active rather than passive voice
- varied sentence structures
- avoiding choppy sentences and unnecessary words
- specific questions or directions to guide student attention to visuals or key information

Visual features. Visual features that improve readability include:

- print that is dark and clear, with good contrast
- paper with clean-cut edges without glare, or computer screens without glare
- margins wide enough on a page or screen to allow easy viewing of the text
- chunking text (sentence ends on same page it begins)
- visuals that are relevant, clear, vivid, and simple enough for students to understand
- quantity of visuals suitable for the intended students (Both lower-ability students and higher-ability students tend to require more visuals.)
- unjustified text (ragged on the right) rather than justified (lined up on the right)
- visuals that contain information in a form different from the text
- graphs, charts, maps, and other visual representations integrated at their point of use
- colors, size of print, spacing, quantity, and type of visuals suitable for the abilities and needs of the intended students

E. PACING OF CONTENT

The amount of content presented at one time or the pace at which it is presented must be of a size or rate that allows students to perceive and understand it.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b).

It is important that materials contain "bite-size" chunks or blocks of information. The chunks should not be so large, nor the pacing so fast, as to overwhelm students. Neither should the chunks be so small, nor the pacing so slow, as to bore them.

F. EASE OF USE OF MATERIALS

Both print and other media formats of instructional materials must be easy to use and replace and be durable enough for multiple uses over time.

See Florida Statutes 1006.29(4); 1006.38(3)(a); 1006.34(2)(a); 1006.34(2)(b); 1006.38(5); 1006.38(6)(7)(8)(9)

Warranty. The physical and technical qualities of materials should match the description contained in the publisher's warranty.

Use. Materials must be designed for practical use in the classroom and school environments. They must be easy to identify and store. Teachers and students must be able to access and use the materials. Some of the factors influencing their ease of use include number of components, size of components, packaging, quality of materials, equipment requirements, and cost to purchase or replace components.

The best choice about weight, size, and number of volumes depends on several factors, such as the organization of the content, how well separate volumes may fit time periods for instruction, and the ages of students. Technical production requirements, such as page limits or different types of bindings, may lead to multiple volumes.

Examples of classroom use include repeated copying of consumable materials and repeated use of other materials by students over time. Students should be able to easily use the materials and take home, in a convenient form, most of the material they need to learn for the course.

Technology-rich resources should work properly, without the purchase of additional software, and run without error. Electronic media for student use should be encoded to prevent accidental or intentional erasure or modification. As with textbooks, electronic media should allow students to easily access and interact with them without extensive supervision or special assistance.

The physical and technical qualities of materials should match with the resources of the schools. Materials such as videos, software, CDs, Internet sites, and transparencies may serve instructional purposes well, but have little value unless they can be implemented with the school's equipment. Publishers should include training, in-service, and consultation to help in effective use of the materials.

Durability. Students and teachers should be able to have materials that will be durable under conditions of expected use. For example, boxes, books, or other materials should not fall apart after normal classroom use. The packaging and form of materials should be flexible and durable enough for multiple uses over time. Durability includes considerations such as

- high-quality paper, ink, binding, and cover
- strength of back, joints, body block, and individual pages
- worry-free technology that runs properly, with audio and visual material that is easy to hear, see, and control.
- the publisher's guarantee for replacement conditions and agreements for reproduction necessary to effectively use the materials

Cost. *Florida's Commissioner of Education will consider the impact of cost in making final decisions.* Cost, while not a direct factor in ease of use, influences the ease with which materials can be obtained

or replaced. The impact of cost can be complex to estimate. It requires considering the number of materials available at no additional cost with the purchase of the major program or text, the cost over the adoption period of several years, and the number of ongoing free materials to support implementation. Attractive features such as higher quality paper and visuals and greater use of color **may escalate cost, without enhancing learning effectiveness.**

Learning

The following features have been found to promote learning and apply to most types of learning outcomes.

A. MOTIVATIONAL STRATEGIES *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b); 1006.38(4)*
B. TEACHING A FEW "BIG IDEAS" *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b)*
C. EXPLICIT INSTRUCTION *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b)*
D. GUIDANCE AND SUPPORT *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)*
E. ACTIVE PARTICIPATION OF STUDENTS *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)*
F. TARGETED INSTRUCTIONAL STRATEGIES *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b); 1003.42*
G. TARGETED ASSESSMENT STRATEGIES *Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b); 1006.38(4)*

The following sections describe the learning features expected for each of these priority areas.

A. MOTIVATIONAL STRATEGIES

Instructional materials must include features to maintain learner motivation.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b); 1006.38(4).

Expectations. Materials should positively influence the expectations of students. Examples include:

- positive expectations for success
- novel tasks or other approaches to stimulate intellectual curiosity
- meaningful tasks related to student interests, cultural backgrounds, and developmental levels
- activities with relevance to the student's life
- thought-provoking challenges such as paradoxes, dilemmas, problems, controversies, and questioning of traditional ways of thinking

- challenges that are neither too difficult to achieve nor so easy that students become bored
- hands-on tasks in a concrete context and images, sounds, analogies, metaphors, or humorous anecdotes
- variety, including the opportunity for students to ask their own questions, set their own goals, and make other choices during learning

Feedback. Materials should include informative and positive feedback on progress. Examples include:

- frequent checks on progress, including testing
- explanatory feedback with information about correctness of responses, how to avoid or correct common mistakes, and/or different approaches to use
- varied forms of assessments (self-assessment, peer assessment, and some learning tasks without formal assessments)

Appearance. Materials should have an appearance generally considered attractive to the intended students.

B. TEACHING A FEW "BIG IDEAS"

Instructional materials should thoroughly teach a few important ideas, concepts, or themes.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b).

Focus. Thoroughly teaching a few big ideas provides focus for the learner's attention. It provides an organizing framework for integrating new information.

Completeness. The thorough teaching of a few big ideas may focus on developing a deeper and more complete understanding of the major themes of a discipline, the content of the subject area, relationships to other disciplines, and the thinking and learning skills required for achieving the specified learning outcomes.

C. EXPLICIT INSTRUCTION

Instructional materials must contain clear statements of information and outcomes.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b).

Clarity of directions and explanations. To support success in learning, instructional materials should include clear presentation and explanations of:

- purposes, goals, and expected outcomes
- concepts, rules, information, and terms
- models, examples, questions, and feedback

For example, development of specific thinking skills requires an explicit statement of the particular *thinking skills* to be learned, along with the *strategies* or *steps to follow*. Explicit instruction for

thinking skills might also involve showing *examples* of successful thinking contrasted with examples of poor thinking processes.

Similarly, the development of learning skills requires explicit directions about *when* and *how* to perform activities such as note taking, outlining, paraphrasing, abstracting and analyzing, summarizing, self-coaching, memory strategies, persistence, preview and questioning, reading and listening, reflecting, and reciting.

Exclusion of ambiguity. Instructional materials should avoid terms and phrases with ambiguous meanings, confusing directions or descriptions, or inadequate explanations.

D. GUIDANCE AND SUPPORT

Instructional materials must include guidance and support to help students safely and successfully become more independent learners and thinkers.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a).

Level. The type of guidance and support that helps students become more independent learners and thinkers is sometimes referred to as *scaffolding.* Scaffolding is a solid structure of support that can be removed after a job has been completed. As students gain proficiency, support can diminish, and students can encounter more complex, life-centered problems. Information and activities should provide guidance and support at the level that is needed—no more and no less. Too much can squelch student interest, and too little can lead to failure.

Guidance and support can be accomplished by a combination of the following features:

- organized routines
- advanced organizers or models such as
    - ◊ condensed outlines or overviews
    - ◊ simplified views of information
    - ◊ visual representations of new information during initial instruction
    - ◊ sample problems
    - ◊ questions to focus on key ideas or important features
    - ◊ examples of solved problems
    - ◊ explanations of how the problems were solved
    - ◊ examples of finished products or sample performances
    - ◊ analogies, metaphors, or associations to compare one idea to another
- prompts or hints during initial practice
- step-by-step instructions
- immediate and corrective feedback on the accuracy of performance of each step or task, on how to learn from mistakes, and on how to reach the correct answer

- simulations with features for realistic practice
- opportunities for students to do research and to organize and communicate results

Adaptability. Guidance and support must be adaptable to developmental differences and various learning styles. For example, young children tend to understand concepts in concrete terms and overgeneralize new concepts. Some students need more time, some tend to be more impulsive than reflective, some have trouble distinguishing relevant from irrelevant information, and some have better written than spoken language skills. Approaches for developmental differences and various learning styles of students include:

- a variety of *activities* such as
    - ◊ structured and unstructured activities
    - ◊ independent and group work
    - ◊ teacher-directed and discovery learning
    - ◊ visual and narrative instruction
    - ◊ hands-on activities
    - ◊ open-ended activities
    - ◊ practice without extrinsic rewards or grades
    - ◊ simple, complex, concrete, and abstract examples
    - ◊ variable pacing or visual breaks
- a variety of *modalities* for the various learning styles of students, such as
    - ◊ linguistic-verbal
    - ◊ logical-mathematical
    - ◊ musical
    - ◊ spatial
    - ◊ bodily-kinesthetic
    - ◊ interpersonal
    - ◊ intrapersonal
    - ◊ naturalist

E. ACTIVE PARTICIPATION OF STUDENTS

Instructional materials must engage the physical and mental activity of students during the learning process.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a).

Assignments. Instructional materials should include organized activities of periodic, frequent, short assignments that are logical extensions of content, goals, and objectives.

Student responses. Assignments should include questions and application activities during learning that give students opportunities to respond. Active participation of students can be accomplished in a variety of ways. For example, information and activities might require students to accomplish types of activities such as:

- responding orally or in writing
- creating visual representations (charts, graphs, diagrams, and illustrations)
- generating products
- generating their own questions or examples
- thinking of new situations for applying or extending what they learn
- completing discovery activities
- adding details to big ideas or concepts from prior knowledge
- forming their own analogies and metaphors
- practicing lesson-related tasks, procedures, behaviors, or skills
- choosing from a variety of activities

F. TARGETED INSTRUCTIONAL STRATEGIES

Instructional materials should include the strategies known to be successful for teaching the learning outcomes targeted in the curriculum requirements.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b); 1003.42.

Alignment. Research has documented the strategies that are effective for achieving different types of learning outcomes. The learning strategies included in instructional materials should match the findings of research for the targeted learning outcomes. Different types of learning outcomes require different strategies. For example, a strategy for memorizing verbal information might be helpful, but it might not align with the strategies required for learning a concept or for learning how to solve a problem.

Completeness. Not only should strategies be aligned, but they also should be complete enough to effectively teach the targeted outcomes. For example, while the explanation of a problem-solving method or model might be appropriate, other strategies also would be necessary in order for students to learn how to resolve different types of problems.

Research summary. Researchers sometimes use different terms for similar outcomes. For example, *thinking skills* and *metacognition* refer to some of the same types of skills. The following alphabetical list includes terms as they have appeared in research, even though some terms clearly overlap with each other.

- attitudes
- cognitive strategies
- comprehension and understanding

- concepts
- creativity
- critical thinking
- insight
- metacognition
- motor skills
- multiple intelligences
- problem solving
- knowledge of procedures, principles, and rules
- scientific inquiry
- thinking skills
- verbal information, knowledge, or facts

Effective Teaching Strategies to Support the Development of Specific Learning Outcomes

Attitudes

- Explain and show consequences of choices, actions, or behaviors.
- Provide relevant human or social models that portray the desired choices, actions, or behaviors.

Reading

- Provide appropriate reading strategies.
- Link instruction to effective reading.

Cognitive Strategies

- Monitor and reflect upon the effectiveness of the reading process used.
- Encourage and/or teach: a) organizing and summarizing information; b) self-questioning, self-reflection, and self-evaluation; c) reference skills; and d) when and how to use these different skills.

Comprehension and/or Understanding

- Outline, explain, or visually show what will be read and/or learned in a simple form.
- Explain with concrete examples, metaphors, questions, or visual representations.
- Require students to relate new readings to previously learned information.
- Require students to paraphrase or summarize new information as it is read.
- Require students to construct a visual representation of main ideas (e.g., map, table, graphs, Venn diagram, etc.).
- Give students opportunities to add details, explanations, or examples to basic information.
- Require application of knowledge or information.

Concepts

- Provide clear understanding of each concept.
- Point out important features or ideas.
- Point out examples of the concept, showing similarities and differences.
- Include practice in organizing and classifying concepts.
- Include a wide range of examples in a progressive presentation from simple to more complex examples.
- Emphasize relationships between concepts.

Creativity

- Provide examples of creativity.
- Include models, metaphors, and analogies.
- Encourage novel approaches to situations and problems.
- Show and provide practice in turning a problem upside down or inside out or changing perceptions.
- Encourage brainstorming.
- Include open-ended questions and problems.
- Provide opportunities for ungraded, unevaluated creative performance and behavior.

Critical Thinking

- Create conflict or perplexity by using paradoxes, dilemmas, or other situations to challenge concepts, beliefs, ideas, and attitudes.
- Focus on how to recognize and generate proof, logic, argument, and criteria for judgments.
- Include practice in detecting mistakes, false analogies, relevant versus irrelevant issues, contradictions, discrepant events, and predictions.
- Provide practice in drawing inferences from observations and making predictions from limited information.
- Explain and provide practice in recognizing factors or biases that may influence choice and interpretations such as culture, experience, preferences, desires, interests, and passions, as well as systematic thinking.
- Require students to explain how they form new conclusions and how and why present conclusions may differ from previous ones.

Inquiry

- Emphasize technological design as inquiry and include discovery activities.
- Provide opportunities for experimental design.
- Provide opportunities for critical thinking.

- Facilitate the collection, display, and interpretation of data.
- Promote careful observation, analysis, description, and definition.

Metacognition

- Explain different types of thinking strategies and when to use them.
- Encourage self-evaluation and reflection.
- Include questions to prompt students to wonder why they are doing what they are doing.
- Guide students in how to do systematic inquiry, detect flaws in thinking, and adjust patterns of thinking.

Technology

- Provide a mental and physical model of desired performance.
- Describe steps in the performance.
- Provide practice with kinesthetic and corrective feedback (coaching).

Multiple Intelligences

- Use the verbal-linguistic dimension to focus on reasoning with language, rhythms, and inflections, such as determining meaning and order of words (stories, readings, humor, rhyme, and song).
- Use the logical-mathematical dimension to focus on reasoning with patterns and strings of symbols (pattern blocks, activities to form numbers and letters).
- Use the musical dimension to focus on appreciation and production of musical pitch, melody, and tone.
- Use the spatial dimension to focus on activities of perceiving and transforming perceptions.
- Use the bodily kinesthetic dimension to focus on use and control of body and objects.
- Use the interpersonal dimension to focus on sensing needs, thoughts, and feelings of others.
- Use the intrapersonal dimension to focus on recognizing and responding to one's own needs, thoughts, and feelings.

Problem Solving

- Assure student readiness by diagnosing and strengthening related concept-, rule-, and decision-making skills.
- Provide broad problem-solving methods and models.
- Include practice in solving different types of problems.
- Begin with highly structured problems and then gradually move to less structured ones.
- Use questions to guide thinking about problem components, goals, and issues.
- Provide guidance in observing and gathering information, asking appropriate questions, and generating solutions.

- Include practice in finding trouble, inequities, contradictions, or difficulties and in reframing problems.

Procedural Knowledge, Principles, and Rules

- Define context, problems, situations, or goals and appropriate procedures.
- Explain reasons that procedures work for different types of situations.
- Define procedures—procedures include rules, principles, and/or steps.
- Provide vocabulary and concepts related to procedures.
- Demonstrate step-by-step application of procedures.
- Explain steps as they are applied.
- Include practice in applying procedures.

Scientific Inquiry

- Explain processes and methods of scientific inquiry.
- Explain and provide examples of: a) hypotheses formation; b) valid procedures; c) isolating variables; d) interpretation of data; and e) reporting findings.
- Encourage independent thinking and avoidance of dead ends or simplistic answers.
- Require students to explain, verify, challenge, and critique the results of their inquiry.

Thinking Skills

- Introduce different types of thinking strategies.
- Explain context or conditions of applying different strategies.
- Provide definitions, steps, and lists to use in strategies.
- Include examples of different types of thinking strategies, including how to think with open-mindedness, responsibility, and accuracy.
- Emphasize persisting when answers are not apparent.
- Provide practice in applying, transferring, and elaborating on thinking strategies.
- Integrate metacognitive, critical, and creative-thinking skills.

Verbal Information, Knowledge, or Facts

- Provide a meaningful context to link new information and past knowledge.
- Organize information into coherent groups or themes.
- Use devices to improve memory such as mnemonic patterns, maps, charts, comparisons, groupings, highlighting of key words or first letters, visual images, and rhymes.
- Identify main ideas, patterns, or relationships within information or sets of facts.

G. TARGETED ASSESSMENT STRATEGIES

Instructional materials should include assessment strategies that are known to be successful in determining how well students have achieved the targeted learning outcomes.

See Florida Statutes 1006.31(4)(e); 1006.34(2)(a)(b); 1006.38(4).

Alignment. The assessment strategies should match the learner-performance requirements for the types of learning outcomes that have been targeted for the subject matter, course, or course category. Different strategies are appropriate for assessing different types of learning outcomes. For example, a strategy for testing the acquisition of verbal information would not match the requirements for testing whether or not a student has learned a concept or learned how to solve a problem.

The term "assessment," as used in this section, refers to testing or other strategies that assess student progress as a result of learning activities. The results of such assessment provide information about where to strengthen instruction. But it is very important to ask the right questions. If the type of question matches the type of learning outcome, then students and teachers have relevant information about learning progress.

Completeness. In addition to including assessment strategies that align with the performance requirements of the targeted learning outcomes, the strategies should be complete enough to effectively assess the learners' performance with regard to the targeted outcome. For example, a test item that requires the student to state a rule does not assess whether or not the student knows how to *use* the rule.

Research summary. The following section provides criteria for effective assessment strategies for different types of learning outcomes.

Effective Assessment Strategies for Specific Learning Outcomes

NOTE. Students should be provided opportunities to learn from their mistakes without being penalized, particularly during the initial stages of new instruction.

Attitudes

- Provide various situations.
- Require choices about behaviors.

Cognitive Strategies

- Provide learning tasks.
- Require students to choose good strategies for learning and/or to learn new materials without teacher guidance.
- Require students to discuss and explain methods used for various learning tasks.

Comprehension and Understanding

- Provide topic.
- Require summary or restatement of information.
- Provide new context.
- Require application of information.
- Provide several statements using words different from the initial teaching.
- Require identification of the correct meaning.

Concepts

- Provide new examples and non-examples.
- Require identification or classification into the correct categories.

Creativity

- Provide new problems to "turn upside down," study, or resolve. These could be performances, presentations, or products.
- Require products or solutions to fit within the particular functions and resources.
- Provide situations requiring novel approaches.

Critical Thinking

- Require students to evaluate information or results.
- Require the use of analysis and research.

Insight

- Provide situations for inquiry and discovery.
- Provide situations for manipulation.

Metacognition

- Provide different situations or problems.
- Require students to identify types of thinking strategies to analyze and evaluate their own thinking.

Multiple Intelligences

- Provide situations in the modality that is targeted, such as verbal-linguistic, musical, or other modality.
- Provide situations in several modalities, to allow choice.
- Require performance in the targeted or chosen modalities.

Motor Skills

- Provide situations and resources for performance of the skill.
- Include a checklist for evaluation.

Problem Solving

- Require students to choose types of problem-solving strategies for different situations.
- Require solutions to structured and unstructured, simple and complex problems.

Procedural Knowledge, Principles, and Rules

- Provide situations that require students to recognize the correct use of procedures, principles, or rules with routine problems.
- Require students to state procedures, principles, or rules.
- Require students to choose which procedures, principles, or rules to apply in different situations.
- Provide situations that require students to demonstrate the correct use of procedures, principles, or rules with routine problems.

Scientific Inquiry

- Provide situations or problems that require speculation, inquiry, and hypothesis formation.
- Provide research, hands-on activities, and conclusions.

Thinking Skills

- Require students to summarize different types of thinking strategies.
- Provide situations that require students to choose the best type of thinking strategy to use.
- Require students to detect instances of open- versus closed-mindedness.
- Require students to detect instances of responsible versus irresponsible and accurate versus inaccurate applications of thinking strategies.
- Provide situations that require the students' persistence to discover or analyze information to obtain answers to specific questions.
- Require students to apply specific thinking strategies to different real-world situations.

Verbal Information, Knowledge, or Facts

- Require students to recall information.
- Require students to restate information.
- Require students to understand information.

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