

## 1.2 Key Concepts, Definitions, and Best Practices

The QEP Team's exploration of how best to improve students' critical thinking skills led to a valuable discussion of what student learning means at CFCC. As the mission of the QEP is to enhance student learning in a meaningful way, articulating what the college most values about the student learning process was a natural first step. This discussion allowed the diverse teaching and service experiences represented on the QEP Team to develop the following statement on student learning:

**Student learning is the priority of Cape Fear Community College. Student learning is the process by which learners enhance their skills, dispositions, and human potential. Student learning involves building new knowledge, skills, and habits on foundations of prior learning. A mutual commitment between instructor and learner based on hard work, inquiry, and integrity is necessary for student learning.**

This statement on student learning provides a conceptual framework for enhancement by emphasizing that learning involves more than mere accumulation of knowledge; learning must also involve the affective elements of cognitive development, the "skills" and "habits" that drive the application of knowledge. Such affective elements are developed and reinforced as learners progress through the college's curricula. This statement also asserts that learning is a shared responsibility of students and instructors that takes real effort and a genuine desire to enhance one's "human potential." Likewise, this Quality Enhancement Plan asserts that improving student learning in the area of critical thinking is the most effective means of enhancing students' human potential as professionals, citizens, and lifelong learners.

In order to improve the facilitation and enhancement of our students' critical thinking skills, a common definition of critical thinking that could satisfy and apply to the college's diverse instructional areas had to be developed. As earlier noted, even though "critical thinking" appears throughout the college's catalog, course descriptions, and syllabi, the college had no agreed upon description of what critical thinking *is* until now. Not surprisingly, establishing such a description was an ambitious endeavor. This can be attributed to two factors: first, faculty and staff's perceptions of critical thinking tend naturally to be determined by experiences in their own courses and service areas; second, there is little agreement on defining critical thinking within the substantial scholarly research on the topic. Both the debate within the scholarly literature and the different perceptions held by faculty and staff result from divergent ideas of *where* and *when* critical thinking can happen, and, consequently, *how* it can be facilitated as an educational objective.

Kurfiss (1988) identifies three distinct perspectives for understanding critical thinking as an outcome of higher education: the "argument skills" perspective, the "cognitive processes" perspective, and the "intellectual development" perspective (p.iii). The argument skills perspective focuses on improving students' informal logic skills, particularly the identification of fallacies and inductive and deductive reasoning (Kurfiss, 1988, p.iii). This perspective provides the model for emphasizing instruction specific to such skills in one or a few introductory courses. This perspective is often expanded to include activities beyond argument analysis, such as problem solving, decision-making, and everyday reasoning (Norris & Ennis, 1989; Smith, 2001). In this conception, critical thinking is applied not only to the ideas of others (in the form of arguments), but also to any situations requiring purposeful, deliberate thinking.

The “cognitive processes” perspective encourages learners to develop a “mental model” (p.iv) in response to complicated situations that lack easily defined answers. In developing this model, learners must use “declarative knowledge,” the “facts and concepts” of a particular field; “procedural knowledge,” the standards of reasoning within a field; and “metacognition,” the ability to monitor one’s reasoning, particularly the effectiveness of a “line of inquiry” (Kurfiss, 1988, p.iv). A similar distinction is drawn by Krathwohl’s (2002) revision of Bloom’s Taxonomy (p.214). The cognitive processes perspective emphasizes recognizing that every field or discipline has unique standards by which information is evaluated and conclusions are reached. As Paul and Elder (2005) assert, “to learn a body of content, say, an academic discipline, is equivalent to learning to think within the discipline” (p.10). This closely relates to the Prince George’s Community College (2004) description of critical thinking as the “sound thinking needed by practitioners in an academic discipline” (p.3). The cognitive processes perspective supports instructional strategies that “explicitly teach discipline-specific procedural knowledge” (Kurfiss, 1988, p.iv).

The “intellectual development” perspective is concerned with learners’ “beliefs about the nature of knowledge and truth” (Kurfiss, 1988, p.iv). This concern is a response to students’ tendency, especially at the college level, to assume “all opinions are equally valid” when confronted with “pluralism, complexity, and uncertainty” (Kurfiss, 1988, p.iv). The intellectual development perspective encourages learners to “confront the indeterminacy of knowledge at the level just beyond their present understanding” in order to develop a “mature epistemology of commitment” based on the fair evaluation of opinions and beliefs (Kurfiss, 1988, p.iv). This perspective also emphasizes conveying to learners the importance of caring whether their own beliefs and opinions are grounded in sound reasoning (Kurfiss, 1988, p.iv).

### **1.2.1 Definition of Critical Thinking**

Preliminary research found considerable variety in how experts in the area defined critical thinking, though many differences seem more the result of descriptive preference than fundamental divergence. Norris and Ennis (1989) define critical thinking simply as “reasonable and reflective thinking that is focused upon deciding what to believe or do” (p.3). Similarly, Kurfiss (1988) defines critical thinking as “an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that can therefore be convincingly justified” (p.2). Both these definitions stress the *product* of critical thinking, namely good decisions or positions.

Rather than product, some definitions of critical thinking emphasize the process. For example, Maiorana (1991) contends that “Critical thinking is the questioning or inquiry we engage in when seeking to understand, evaluate, or resolve” (para.2). Van Gelder (2005) describes the critical thinking process as a “highly contrived activity” similar to mastering a sport or foreign language that “involves skillfully exercising various lower-level cognitive capacities in integrated wholes” (p.42).

Wolcott (1999) defines critical thinking in terms of four essential abilities critical thinkers at the college level should have:

- Ability to recognize the uncertainties in a problem that might prevent a single “correct” solution
- Ability to frame a problem adequately (organizing and analyzing information, understanding alternative viewpoints, and recognizing and controlling for initial biases)
- Ability to reach, articulate, and defend a solution as most reasonable

- Ability to recognize the limitations of a solution and to consider possible reevaluations as new information becomes available (p.4)

Wolcott's definition extends the process emphasis by describing the learning outcomes that could be demonstrated within the critical thinking process as well as in the product of effective critical thinking.

Other definitions of critical thinking are more focused on the disposition of one who thinks critically. For example, Ikuenobe (2002) asserts, "critical thinking and learning involves the effort, willingness, and attitude to be always open to new evidence, requiring that we ought to change our belief with new evidence. . . . Such effort or willingness involves adopting a rigorous and critical attitude which requires that we be tentative about the reasonableness of our beliefs and that we be open to other plausible evidence or counter evidence which others are aware of" (pp. 372-373). Chaffee (2006) offers a similar, though more concise definition in the glossary of his *Thinking Critically* textbook: "[critical thinking is] the act or habit of carefully exploring the thinking process, in order to make more intelligent decisions" (p.535). Likewise, Paul and Elder's (2005) definition focuses on the quality of reasoning by describing critical thinking as "the process of analyzing and assessing thinking with a view to improving it" (p.7). This definition points to the type of purposeful reflection described by Facione and others in the "Delphi Report" (1990): "We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (p.2).

In developing a working definition of critical thinking to provide a solid basis for this plan, the similarities, strengths, and weaknesses of these and other perspectives were considered. The QEP Team wanted to adopt the best elements of each perspective for a definition that would be accessible and useful for all CFCC students, faculty, and support staff. To that end, the QEP Team created the following statement:

**Cape Fear Community College defines critical thinking as the deliberate process of questioning, evaluating, and responding to problems, scenarios, and arguments in order to reach sound solutions, decisions, and positions.**

This definition emphasizes that, as Bailin et al (1999) observe, critical thinking is thinking that is "directed toward some end or purpose, such as answering a question, making a decision, solving a problem, devising a plan, or carrying out a project" (p.286). That is, critical thinking enables learners to respond intelligently to situations such as those described above. This definition conveys several important principles that inform CFCC's efforts to improve the facilitation of students' critical thinking skills.

First among these is the principle that students must *deliberately* engage in critical thinking. Providing students with a set of skills is pointless unless they are willing to use those skills. Any plan to foster critical thinking must acknowledge the importance of a student's "attitude or disposition to recognize when a [critical thinking] skill is needed and the willingness to exert the mental effort needed to apply it" (Halpern, 1999, p.72). As Facione (1990) asserts, effective instruction for improving critical thinking skills must help learners develop the "confidence, inclination, and good judgment" to use these skills (p.4). Thus, critical thinkers must have a desire and disposition to think critically in a variety of situations.

The second principle is that critical thinking is best thought of as a process of *questioning*, *evaluating*, and *responding* that can be applied across a broad range of academic, professional, and personal contexts. In determining how best to describe these contexts, the QEP Team

considered the diverse learning situations CFCC students encounter. Students must confront and solve *problems* in areas ranging from mathematics to electronic engineering to marine technology; they may encounter *scenarios* in the health sciences, business, and public service; and they will be exposed to *arguments* in literature, the humanities, and social sciences. In all cases, students engage in processes of reasoning, the quality of which helps determine the subsequent success and depth of student learning.

Questioning is the first and most fundamental step in the critical thinking process. Before students can actively think their way through problems, scenarios, or arguments, they must first ask pertinent questions that clarify the nature of the issue at hand. Learners must develop the skills and knowledge to recognize what questions are most pertinent in a given situation. As Browne and Freeman (2000) suggest, the value of pertinent questions “stems from their importance as stepping stones toward the evaluation of reasoning. To begin, critical thinking requires comprehension. To evaluate reasoning, one must first discover it” (p.302). Consistently seeking to ask the best questions in a given situation is a disposition learners must develop, a disposition best described as a *spirit of inquiry*.

Such purposeful inquiry leads critical thinkers through the process of informed reasoning using the higher order thinking skills of analysis, synthesis, and evaluation. This process can involve sorting and ranking information, developing comparisons, identifying assumptions, drawing inferences, considering alternatives, and predicting consequences. Like the questioning process, learners must acquire knowledge of these and related strategies, develop skill at applying such strategies, and embrace the disposition or habit of mind to do so. Finally, critical thinkers thoroughly and fairly apply the process of evaluation to information in order to arrive at appropriate responses.

CFCC’s definition of critical thinking counts the *soundness* of responses as the appropriate standard by which thinking is evaluated; what makes a solution, decision, or position sound is determined by the quality of the reasoning used to reach it. This is why it is important for critical thinkers to not only articulate clear responses, but also explain their reasoning processes, defend their conclusions, and fairly evaluate the quality of their own reasoning. As Bailin et al. (1999) observe, “If the thinking is sloppy, superficial, careless, rash or naïve, most advocates of critical thinking would not agree it is critical thinking” (“Conceptualizing” p.287). This notion conforms to Paul and Elder’s (2005) previously discussed position that critical thinking is ultimately “assessing thinking with a view to improving it” (p.7), as well as Norris and Ennis’ (1989) claim that “good thinking does not lead to just *any* conclusions, but in general to the *best* conclusions [emphases original]” (p.3).

### **1.2.2 Student Learning Outcomes**

CFCC’s definition of critical thinking provides the basis for describing the student learning outcomes (SLOs) addressed by this plan. These outcomes, in turn, provide specific targets for instructional enhancement and the assessment of student learning, as well as a commonality of purpose that will encourage cross-curricular communication and collaboration. This quality enhancement plan addresses the following student learning outcomes:

<b>Students demonstrate critical thinking when they</b>	<b>1. Ask pertinent questions that clarify and focus a problem, scenario, or argument</b>
	<b>2. Evaluate the quantity, quality, and usefulness of information</b>
	<b>3. Articulate a sound solution, decision, or position based on appropriate standards of reasoning</b>
	<b>4. Monitor and reflect upon the quality and fairness of their</b>

	<b>reasoning</b>
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These learning outcomes describe how students ideally will apply critical thinking skills to the various academic, professional, and personal contexts they encounter.

**SLO (1): Ask pertinent questions that clarify and focus a problem, scenario, or argument**

Pithers and Soden (2000) confirm that critical thinking “involves being able to identify questions worth pursuing” and “being able to pursue one’s questions through self-directed search and interrogation of knowledge” (p.238) Paul and Elder (2005) identify “Questions, Problems, and Issues” as their second standard of critical thinking competency (p.22). Outcomes derived from this standard include “divide complex questions into sub-questions,” “formulate foundational and significant questions within any particular discipline or subject,” “distinguish conceptual questions from factual questions,” and “distinguish significant questions from trivial ones, relevant from irrelevant ones” (p.23). Norris and Ennis (1989) also describe “Asking and answering questions of clarification and challenge” (p.183) as an important marker of critical thinking.

**SLO (2): Evaluate the quantity, quality, and usefulness of information**

Information in this case refers to all data pertinent to the problem, scenario, or argument at hand. The evaluation of information results from effective inquiry, analysis, and synthesis. Paul and Elder’s (2005) third critical thinking competency standard describes important steps in this process, including “distinguish relevant from irrelevant information when reasoning through a problem,” “objectively analyze and assess information in coming to conclusions,” and “demonstrate understanding of the types of information used within particular subjects and disciplines” (p.24). Norris and Ennis (1989) describe five aspects of evaluation relating to this outcome: “Judging the credibility of a source,” “Making and judging observations,” “Making and judging deductions,” “Making and judging inductions,” and “Making and judging value judgments” (pp.184-185). Nickerson (2004) also lists “Sensitivity to missing information” as a component of good reasoning (p.415).

**SLO (3): Articulate a sound solution, decision, or position based on appropriate standards of reasoning**

This outcome conforms to Wolcott’s (1999) third critical thinking skill for college students: “Ability to reach, articulate, and defend a solution as most reasonable” (p.4). Columbus State Community College similarly identifies “Draw Conclusions” as one of its major critical thinking outcomes (Peterson et al, 1994). Specific “student behaviors” relating to this outcome include “be able to examine problems, issues, and science articles and develop a defensible conclusion,” “make a decision about a particular topic or issue,” “take and defend a particular value position,” and “utilize information from a variety of sources to formulate a course of action” (Peterson et al, 1994). This outcome also relates to those described by Paul and Elder (2005), including “draw conclusions only to the extent that those conclusions are supported by facts and sound reasoning” (p.24) and “reach independent, well-reasoned conclusions” (p.39). Standards of reasoning are often determined by the “point of view of [a] discipline” and “its assumptions, implications, and practical consequences” (Paul & Elder, 2005, p.15).

**SLO (4): Monitor and reflect upon the quality and fairness of their reasoning**

This outcome is primarily concerned with the reflective or “metacognitive” component of critical thinking. As Norris and Ennis (1989) explain, “critical thinkers must be reflective in that they examine the reasonableness of their own and others’ thought” (p.4). Paul and Elder (2005) stress that learners “monitor their thinking and amend their own mistakes” (p.39) and “identify

consistencies and contradictions in their thinking” (p.36). Pithers and Soden (2000) likewise emphasize that learners must “develop their metacognitive knowledge and skills” (p.243) which Garcia and Pintrich (1992) describe as “strategies involving monitoring, regulating, and planning” (p.4). Nickerson (2004) frames the importance of this outcome by describing the “disposition of reflectiveness” (p.430) as the willingness to “[test] the tenability of an initial conclusion by seeking information that might tell against it” (p.431). Finally, the habits of mind demonstrated in this outcome are essential to the successful demonstration of all the other critical thinking outcomes described above.

These generalized learning outcomes will form the basis for program and course level student learning outcomes (SLOs) in critical thinking, as well as CFCC’s critical thinking rubric.

### **1.2.3 Key Concepts, Best Practices, and Guiding Principles**

Several key concepts provide the theoretical foundation for this plan. These concepts are the result of thorough research into the scholarly literature on critical thinking as an educational objective. Conducting this research involved examining a variety of perspectives from disciplines as diverse as developmental psychology, business management, and natural sciences. These perspectives were then considered with the college’s mission, vision, and culture in mind in order to identify what concepts would best serve this enhancement effort. The concepts identified below shape the initial research design of this plan and will be amended as needed as assessment data become available.

#### **Critical Thinking Has Both Specific and General Elements**

This plan distinguishes between two types of critical thinking skills. The first type involves *general* critical thinking skills. These skills are the broad processes that Smith (2001) calls the “concepts, heuristics,” and “techniques” (p.361) that are commonly applied to academic, professional, and everyday reasoning. Such skills include predicting outcomes, weighing options, and diagnosing problems. A general conception of critical thinking also encompasses the dispositions that go along with good reasoning in a wide range of contexts. Bailin (2002) describes these as “habits of mind, such as open-mindedness, fair-mindedness, and a commitment to making judgments on the basis of reasoned assessment” (p.369). In this plan, *general critical thinking skills* refers then to the most common skills and dispositions associated with reaching sound solutions, decisions, and positions in a variety of situations.

The second type involves *context-specific* critical thinking skills that derive unique processes and standards of reasoning from a particular discipline or profession. These processes and standards may be similar to those in closely related fields, but typically demand a specific knowledge base grounded in the core concepts and theories of a discipline or profession. Typically, the higher the level of one’s study within a discipline or advancement in a profession, the more one’s context-specific critical thinking skills develop. Such skills are applied within a field’s agreed upon standards of reasoning; likewise, the soundness of any solution, decision, or position will be evaluated by those same standards.

The distinction between the specific and general elements of critical thinking is the subject of considerable debate (Smith, 2002; Moore, 2004; Nickerson, 2004) centering on whether thinking can be improved in both “domain-independent” and “domain-specific” contexts (Nickerson, 2004, p.426). This plan seeks to enhance both general and specific critical thinking skills, working within Nickerson’s (2004) assumption that “both domain-specific knowledge and domain-independent capabilities are likely to be involved in truly competent” (p.426) demonstrations of critical thinking. Another key assumption is that any program of study has the potential to address both

types of skills. This is especially important in terms of the potential for the transferability and reinforcement of critical thinking skills. This plan assumes that students can transfer their general critical thinking skills, at least partially, from one academic context to the next, as well as to non-academic, everyday contexts. Perkins and Salomon (1989) report such transference as being either spontaneous (“low road”) or intentionally facilitated (“high road”) (as cited in Nickerson, 2004, p.433). This transference then allows students to reinforce and build upon their general critical thinking skills, as well as dispositions, in novel situations. The potential for transference of context-specific critical thinking skills is significantly less, due to the specialized standards of reasoning discussed above. This does not imply, however, that these skills are not legitimate educational objectives. Developing students’ skills to think critically using the standards and concepts of a particular discipline is, on the contrary, the highest ideal of meaningful, deeply engaged learning.

This plan seeks to improve students’ critical thinking skills through the gradual development of increasingly sophisticated levels of reasoning. Students will ideally develop more effective general and specific critical thinking skills as they progress through the college’s curricula so that upon completion of an academic program, they will possess and demonstrate more advanced critical thinking skills than those with which they began. Enhancing this cumulative outcome is the rationale for this plan’s emphasis on examining how students’ progression through the curricula positively affects their critical thinking skills.

### **Best Practices and Guiding Principles**

A review of scholarly literature on best practices for enhancing and assessing learners’ critical thinking skills provides several principles to which this plan adheres. First among these is that students must develop a sense of the value of thinking critically. Providing students with any level of critical thinking skills is futile unless students also develop the inclination to apply these skills independently in subsequent academic, professional, and personal contexts. This notion relates to the previous discussion of critical thinking as comprised of both skills and dispositions.

One way to emphasize the importance of critical thinking to students is to connect the application of critical thinking skills in an academic context to a non-academic context. As is widely acknowledged, students are more likely to embrace and internalize skills and knowledge they sense will immediately benefit their non-academic lives. Another way to convey the value of thinking critically is for instructors to model the application of critical thinking within their disciplines. This simply means demonstrating for students the inner workings of a critical thinker (the instructor) reasoning through a difficult problem, scenario, or argument using the appropriate general and specific critical thinking skills. This approach moves the role of the instructor from transmitter of knowledge to a mentoring model, a role that encourages students to learn through application and take more responsibility for their educational experience. An additional benefit of a mentoring model approach is that standards of reasoning can be openly discussed, analyzed, and evaluated. Brandt, Farmer, and Buckmaster (1993) describe a version of this approach, cognitive apprenticeship, as “an instructional method for teaching an acceptable way of understanding and doing tasks, solving problems, and dealing with problematic situations” (p.69). Doing this, according to Kelder (1992), requires that instructors “illustrate for students how ‘discipline-specific’ problems are represented, and reasons, knowledge statements and propositions are made and assessed within this disciplinary framework” (p.8). Additionally, Middendorf and Pace (2004) emphasize the need for instructors to “demonstrate to students the steps that come naturally to the expert” (p.6) when negotiating course content and the standards of reasoning specific to a discipline.

Making standards of reasoning and the reasoning process itself more accessible to learners directly relates to the importance of making the intended objectives of teaching for critical thinking explicit. Students need some basic understanding of what critical thinking is if they are ever to develop and improve their skill in applying critical thinking. As Van Gelder (2005) argues, instructors must help students “develop theoretical understanding as a complement to the crucial hands-on know-how” (p.44). The application and practice of critical thinking must be underpinned by a meaningful theory of critical thinking. This is why developing and discussing a common definition of critical thinking is important to any plan that attempts to improve students’ critical thinking skills across the curriculum. Students and instructors will have a common language from which to begin a meaningful dialogue on the theoretical elements of critical thinking.

Theory must complement application, however. Students will benefit most from actively engaging with “ill-formed” problems, scenarios, and arguments that call for thinking that goes beyond recalling memorized information. Wolcott (1999) defines “unstructured problems” as those “having no single correct solution” (p.4), while Lynch, Carter-Wells, and Chambers (2000) describe “problems that are fraught with significant and enduring uncertainties” (p.1). Brandt, Farmer, and Buckmaster (1993) also discuss the importance of preparing learners to engage with “ill-defined, complex, and risky situations” (p.69). As learners approach the types of problems described above, they must often consider multiple viewpoints or solutions, identify and apply appropriate steps in the reasoning process, and reflect on the quality of that process. As Browne and Freeman (2000) argue, the “sponge model of learning is terminally disrupted when the learner encounters multiple experts, each of whom answers the same question in a unique and seemingly reasonable fashion” (p.305). Such activities address the very skills students will need to compete and succeed in today’s knowledge economy.

In *What Matters in College?: Four Critical Years Revisited*, Astin (1993) describes the following strategies his extensive study found “are likely to enhance critical thinking: a strong emphasis on writing, a content focus on science and history, an interdisciplinary emphasis, and active engagement by the student in discussion, debate, class presentations, and talking over vocational and career plans” (p.227). Garcia and Pintrich (1992) also explore the relationship between composition and critical thinking, particularly the “planning, regulating, and monitoring” requirements both activities share (p.14). Kurfiss’s (1988) review of best practices to encourage critical thinking identifies eight principles:

1. Critical thinking is a learnable skill; the instructor and peers are resources in developing critical thinking skills.
2. Problems, questions, or issues are the point of entry into the subject and a source of motivation for sustained inquiry.
3. Successful courses balance challenges to think critically with support tailored to students’ developmental needs.
4. Courses are assignment centered rather than text and lecture centered. Goals, methods, and evaluation emphasize using content rather than simply acquiring it.
5. Students are required to formulate and justify their ideas in writing or other appropriate modes.
6. Students collaborate to learn and to search their thinking, for example, in pair problem solving and small group work.
7. Several courses, particularly those that teach problem-solving skills, nurture students’ metacognitive abilities.

8. The developmental needs of students are acknowledged and used as information in the design of the course. Teachers in these courses make standards explicit and then help students learn how to achieve them. (pp.88-89)

Kurfiss's eight principles simply reiterate the ideas discussed earlier and confirm that there are agreed upon best practices for improving students' critical thinking skills and that these practices involve encouraging active learning, purposeful inquiry, and self-monitoring.

#### **1.2.4 Summary**

CFCC began its efforts to enhance student learning by defining critical thinking as the deliberate process of questioning, evaluating, and responding to problems, scenarios, and arguments in order to reach sound solutions, decisions, and positions. This definition was developed through broad-based input from the college community and substantial scholarly research. The benefit of having a common definition of critical thinking is that it provides faculty, staff, and students with a common language to discuss what has become the primary educational objective of this college. Additionally, this definition provides a basis for the student learning outcomes addressed in this plan. Students demonstrate critical thinking when they:

- Ask pertinent questions that clarify and focus a problem, scenario, or argument
- Evaluate the quantity, quality, and usefulness of information
- Articulate a sound solution, decision, or position based on appropriate standards of reasoning
- Monitor and reflect upon the quality and fairness of their reasoning

This shared understanding of critical thinking and its indicative learning outcomes will facilitate exchanges of ideas amongst instructors, provide consistent reinforcement for students, and support this enhancement effort across the curriculum. The best practices reviewed in this section provide a practical understanding for the most effective means of enhancing students' critical thinking skills.

