Conversations on Student Success

Topic 3. Critical Thinking

***Note: for articles below that require a log-in, see these instructions.

BEST BET READING


The author summarizes research about what to teach about thinking skills and how to divide a skill into components. Essential features and ideas for direct instruction are mentioned. Literature sources on how to introduce a skill, make the procedure explicit, and guide students as they practice the skill are included. Lesson strategies plus when and where to teach critical thinking skills are described.


The literature review includes definitions of critical thinking and perceptions and applications for developing techniques for undergraduate education. The study involved interviews with eight faculty members from a private liberal arts university in the Southwest. Questions included (1) How do faculty members define critical thinking in the classroom? (2) How does this definition influence their pedagogical choices? and (3) What is the role of institutional culture and ideology in the development and maintenance of critical thinking? Definitions differed but themes emerged. Faculty lacked any formal training in teaching critical thinking and therefore use pedagogical experimentation. All mentioned content, but not all saw mastery of content as necessarily connected to development of higher order thinking skills. All participating faculty saw their role as facilitator and guide, but most used what they called force or aggressive teaching techniques to “make” their resistant students think critically. Some faculty members themselves resist critical thinking, fearing broaching controversial subjects that may negatively influence their evaluations or departmental standing. Some agree with the author who states “If learning requires effort, then critical thinking requires absolute exertion.” It also requires that faculty members monitor their own beliefs and biases and recognize that students often find critical thinking difficult based on their cultural perspective.


In the “one of many” model of teaching critical thinking, the instructors think they are using a variety of methods and expect one or more methods to help the student learn the material. Usually the textbooks play a role in this flawed method because the so-called critical thinking exercises boil down to different methods of rote learning. (This view is based on analysis of community college textbooks for 24 majors in 17 disciplines).

In the “cover as much as possible” model, the students cannot discriminate between fundamental concepts and peripheral ones. Instead, they memorize what they are coached will be on the test
(by the textbook or the instructor) and leave with little comprehension. Faculty also err when thinking students have “no knowledge” related to the subject when they begin. Actually, students have little accurate, connected knowledge about the subject but they do have a hodgepodge of thinking, both cultural and personal that they try to use to interpret the subject matter. Instead, students need to learn 4-12 central concepts for a discipline. They can then use them to think through almost anything such as exceptions to the common procedures, analysis of case studies, solving problems, cause and effect. Thus the community college curriculum can lay the foundation for subsequent education, for life-long learning, and for participation as a thoughtful citizen.


This literature review includes a variety of common definitions of critical thinking used in education. One author notes that factual material taught has a relatively short lifespan and many students in basic courses have only a superficial understanding of what they have learned. Teaching critical thinking is a difficult endeavor, but faculty in career and technical education can build curriculum that promotes these skills by understanding what constitutes a critical thinker and how important it is to business and industry and citizenship. Traits that can constitute a critical thinker are described and some conditions required to teach critical thinking are included.


No specific set of critical thinking skills actually exists. The author believes techniques can be taught but they work poorly if taught in a stand-alone way as has been the case in the last 25 years. Students must have some content or domain knowledge before they can apply any technique. It is difficult to get beyond the “surface structure” of a problem and to know when to look more deeply. The assessments of critical thinking programs used in the last 25 years are limited or flawed. However, most show that skilled teaching/coaching and practicing techniques, especially across dissimilar material, can increase abilities.

ASSESSMENT


While acknowledging the reasons critics say institutions cannot be compared, the author believes that the attribute of higher-order thinking skills is possible and necessary to assess and compare. The trend toward greater transparency is irreversible. Currently, most faculty have no way to determine if their institution develops these skills and if, which and how individual instructors at their institution successfully accomplish improved student critical thinking abilities. Employers say they are not as concerned about what students major in as they are about how well and flexibly they think. Comparative assessments should supplement local assessments. The assessments must be constructed and the results analyzed and communicated so that they contribute to teaching and learning because otherwise, faculty will ignore it.

An overview of approaches to assessing critical thinking in community colleges indicates that there are many definitions and therefore many approaches to assessment. The article includes a brief description of standardized tests and examples of several institutionally developed methodologies. Finally, it identifies challenges in assessing critical thinking in two-year colleges.


Humorous but thought-provoking – are we guilty of any of these mistakes?


Baker University in Baldwin City, Kansas has used a two-semester freshman critical thinking and composition course for fifteen years. The assessment used as a pre/post test in the freshman course is the Ennis-Weir Critical Thinking Essay Test. In recent years they have added a senior capstone course where it is given again. Results indicate that an integrated approach to the teaching of critical thinking skills yields greater gains on standardized tests than do one-semester stand-alone logic or critical thinking courses.

DISCIPLINE-SPECIFIC SOURCES

Note: There are more sources available for these and other subject areas. Contact Kaki Hoover, kjhoover@actx.edu for help finding something specific for your courses.

NURSING


Contains patient case studies, templates and work sheets, and classroom activities that employ critical thinking skills.

A study was conducted to examine the effects of a problem-based learning methodology versus primarily lecture-based instruction on the critical thinking skills of associate degree nursing students in an elective 12-week NCLEX licensure exam review course. The ATI Critical Thinking Test was given before and after the course to assess general critical thinking skills among the students. There was a slight change from pre- to post- means for both groups; however, the problem based learning group had a higher standard deviation on the pre-test score than did the lecture group. Both groups performed as well as all groups of test takers in the ATI data pool. Results showed there was not a significant difference in the pass/fail rate on the NCLEX exam. The study authors caution that only 54 students participated. The problem-based learning teaching methodology was conducted over one semester. The results may have increased significantly if this teaching method was used throughout the program. Researchers believe the methodology shows merit and that the way they describe using it can be a model for nurse educators.

**HISTORY**


This article presents four guidelines for providing direct instruction in thinking skills in social studies and history at any grade level. The author first describes, with examples, three major components of any thinking skill that students need to know. Second, he presents teaching techniques for making these components explicit. Third, he outlines and explains two different strategies for organizing introductory skill lessons. Fourth, he describes a variety of techniques for scaffolding and cueing continuing thinking-skill practice as well as strategies for organizing different types of skill-practice lessons. He explains principles for employing these techniques and strategies throughout. He also highlights three factors teachers should consider in implementing thinking-skills instruction. The article concludes with a brief research-based rationale for infusing thinking-skills instruction with social studies and history instruction. (author abstract)

**PHYSICAL THERAPY**


The purpose of the study was to determine if critical-thinking skills changed as a result of completing a 27-month, traditional physical therapist (PT) education curriculum at the post-baccalaureate level. The California Critical Thinking Skills Test (CCTST) was administered during the first week in the PT education program and again during the last week of the program. Results indicated that critical-thinking abilities of PT professional students as measured by the CCTST did not change as a result of participation in a master's degree PT education program.
BUSINESS


The authors describe active learning experiences in a course on business negotiations that teaches students to negotiate while sharpening their critical-thinking skills in the context of a simulated real-world application. Templates used in the class are included in the appendix.


Because the development of critical thinking skills is an important part of learning and is key to the outcomes assessment model created by many universities, the author developed a rubric for introducing critical thinking skills to undergraduates. Students were evaluated at various times during the semester to determine the degree to which they benefited from the use of this learning method. The author concluded that the rubric had some success but that further study was needed before the effectiveness of the learning technique could be determined.

ENGLISH


The author uses William G. Perry’s theory that students move, in their learning, through a series of fairly well-defined phases that can be delineated by detailing the ways in which they view themselves in relationship to what they believe knowledge to be: dualism, multiplicity, relativism, and commitment in relativism. These phases are briefly described. Teaching analysis of literature challenges the instructor who has students in different phases of Perry’s cycle. Students can be led through the phases during the literature course in ways the author describes having used and refined over time.

PHYSICAL SCIENCES


Duke University developed a process by which (a) questions are prepared with both content and critical-thinking skills in mind, and (b) grading rubrics are prepared in advance that specify how to evaluate both the content and critical-thinking aspects of an answer. The faculty using this methodology in an introductory biology class believe it has clarified the course goals (for instructors and students), improved student metacognition, and identified areas of confusion about course content.

Students need tools, thinking skills, to help them think actively and in depth about biological phenomena. They need to know what kind of questions to ask and how to find answers to those questions. In this article we present a toolkit with 12 "thinking tools" for asking and answering questions about biological phenomena from different perspectives. We show how teachers can use the toolkit to design lessons in which students are stimulated to think deeply and from multiple perspectives about biological phenomena. (Author abstract)

**BONUS INFORMATION**


Derek Bok, former president of Harvard University, speaking at a 2006 meeting of the Western Association of Schools and Colleges. Attendees at a SACS meeting where Bok spoke the same year indicate his ideas about how college students should be learning more were similar.

NOTES:

- You may view the whole Book TV speech or choose to view only the “critical thinking” section by selecting it from the options below the viewing screen.
- You may also sample the full text of Derek Bok’s book on [www.books.google.com](http://www.books.google.com). Search it by title (Our Underachieving Colleges) and see chapter five “Learning to Think.”


Tinto reviews Derek Bok’s book Our Underachieving Colleges and points out the differences in community colleges versus the ones Bok is familiar with, including Harvard.