2.2.5 Overview of Critical Thinking

by   *Paula Bobrowski (Associate Dean for Research and Faculty Development, Auburn University) and Pamela L. Cox (Management, SUNY College at Oswego)*

Critical thinking is the ability to use and manage intelligence and skills for tasks or goals across all four domains of knowledge. Although many strategies and models of critical thinking are available to educators and learners, the degree of success in application usually depends upon the user's level of awareness of what strategy will fit what problem in what context. This module examines definitions of critical thinking and addresses questions such as whether it is beneficial to provide specific training in such skills. Examination of the metacognitive skills required for critical thinking within any discipline is followed by a set of tactics for enhancing critical thinking performance in the classroom. A holistic rubric for assessing critical thinking skills concludes the module.

Importance of Critical Thinking

There is an intimate interrelation between knowledge and thinking. Knowing that something is so is not simply a matter of believing that it is so; knowledge is justified belief. There are general as well as domain-specific standards for the assessment of thinking. Critical thinking supports the creation of new knowledge, or improved quality of knowledge, in any field or application (Paul, 2003).

Edward deBono (1995) believes that, "…many highly intelligent people are bad thinkers. Intelligence is like the horsepower of a car. A powerful car has the potential to drive at any speed. But you can have a powerful car and drive it badly." He discusses how critical thinking is the "driving skill" with which each individual manages his or her intelligence. Critical thinking activities need to be sequenced in ways that elevate learner use (***2.2.2 Elevating Knowledge from Level 1 to Level 3***), and learners must be meta-cognitively aware of how their use of critical thinking strategies fits the requirements of different problems.

Critical thinking is also connected with employers' desires for college graduates who are curious, analytical, reflective thinkers, and problem-solvers; and critical thinking skills are vital for maintaining effective workplace relationships. Employers demand that their new hires have more than textbook knowledge and technical skills; they want problem solvers who can be effective in today's work environments (Pithers & Soden, 2000). McEwen (1994) presents additional evidence that the ability to think critically is important to job performance and career mobility.

Despite the importance of critical thinking, many educational analysts and researchers report that students leave higher education with an underdeveloped ability to think critically because undergraduate curricula in general do not emphasize the teaching of these skills. Critical thinking must be based on articulated intellectual standards that are used to assess the quality of critical thinking in context.

Multiple Definitions of Critical Thinking

Glock (1987) argues that there is no definitive way to define critical thinking and that some of the differences between definitions cannot easily be reconciled. Some authorities contend that critical thinking is a way to think about subject matter; others think it is a kind of knowledge or a skill or a habit; still others insist that it is a way of thinking about thinking. Glock describes critical thinking as diverse cognitive processes and associated attitudes critical to intelligent action in diverse situations and fields that can be improved by instruction and conscious effort. A Chaffee College (1988) statement about critical thinking asserts that it cannot be reduced to one skill or even to one set of skills because it involves intelligent actions that enable students to comprehend, communicate, or engage in problem-solving or strategy-building techniques. In other words, critical thinking plays a strong role in problem solving, in synthesizing of hypotheses or alternative solution strategies, and in assessing the quality or success of results. Because it is used in these, as well as in many other uses and contexts, critical thinking remains difficult to fully capture in any one definition. It also cannot be easily broken into standard steps in a process methodology as has been done in the ***Learning Process Methodology (2.3.8)***. Educators such as Paul (2003) help to guide the use of critical thinking by providing frameworks, models, and criteria as flexible, universal tools.

Practices for Critical Thinking

Across universities and disciplines, one finds multiple definitions for critical thinking and different approaches to practicing it. In reality, critical thinking "looks" different in different contexts because the focus must be adapted for each purpose. The following definition is broad in scope; rather than being prescriptive, it embraces multiple approaches to critical thinking.

Critical thinking can be significantly enhanced or diminished by social, affective, psychomotor, and spiritual influences. Critical thinking includes a healthy skepticism about sources of information, one's internal thinking and self-assessment processes, and the quality of the resulting solutions, conclusions, decisions, or new knowledge. It fundamentally involves metacognition, i.e., thinking about thinking while thinking. A quality learning environment

> **Critical thinking** is the synergistic process of constructing and applying knowledge efficiently and effectively to select strong, relevant logic and evidence; to draw accurate conclusions from logic and data, to make strategic decisions; to support problem solving; and to produce higher quality insights in scholarship and research processes, i.e., in the creation of new knowledge. Critical thinking spans skill areas such as information processing, reasoning, analysis, synthesis, and creativity. It is the ability to make linkages across contexts with thoughtful purpose and flexibility.

(**3.1.1 Overview of Quality Learning Environments**) enhances learners' growth in critical thinking by providing instruction, facilitation, and assessment that lead to increasing internalization of the processes involved (**2.3.7 Learning Processes through the Use of Methodologies**).

Critical Thinking in the Curriculum

"To define critical thinking skills is to restate many of the traditional goals of higher education; that is, to provide a program of instruction that enables students to become independent learners, to be capable of exercising informed and balanced judgment, and to contribute as mature citizens in their society." (Chaffee College, 1988)

The notion of teaching critical thinking in separate "add-on" courses has been largely abandoned because of evidence that these skills can be developed more effectively when integrated with the teaching/learning of subject-matter content (Bonnett, 1995). Deepened understanding and use of disciplinary or professional knowledge occurs when students explore multiple perspectives, ask penetrating questions, critique the quality of their available information, and link their own and other's information to relevant questions (Langer, 1997).

Paul (2003) argues that instruction in all subjects should result in the progressive disciplining of the mind with respect to the capacity and disposition to think critically within that domain and should contribute to a self-chosen commitment to a life of intellectual and moral integrity. Hence, instruction in science should lead to disciplined scientific thinking; instruction in history should lead to disciplined historical thinking; and in a parallel manner to every discipline.

The exploration of what critical thinking is suggests some principles relevant to its integration into curricula and programs. Educators most clearly agree that high-quality critical thinking requires the development or growth in the following skills and capabilities:

1. Identifying and pursuing questions, problems, and assumptions through research (Ennis, 1993; Pithers & Soden, 2000)

2. Presenting evidence to support arguments persuasively (Pithers & Soden, 2000)

3. Judging the validity of data, evidence, arguments, and assumptions (Ennis, 1993)

4. Proposing opinions as alternatives to one's own opinions and knowing what evidence would support these opinions (Pithers & Soden, 2000)

5. Recognizing errors in thinking so as to make reasonable decisions about what one believes (Norris & Ennis, 1989)

6. Applying critical thinking skills within the discipline and generalizing one's thinking to life outside the discipline (Cowan, 1994)

Designing critical thinking into courses and curricula requires considering how to evaluate the effectiveness of the desired learning outcomes, e.g., those in the above list, and to incorporating measurement tools into curriculum and activity designs (Critical Thinking Consortium, 2003).

Tools and Techniques for Facilitating Critical Thinking Skills

To enhance how critical thinking is addressed in any curriculum, the following examples and tools are useful starting points. The central logic of each discipline must be considered in deciding which tools and techniques can best help students to successfully confront the core components of any discipline. For example, integrating critical thinking with writing is one technique that is relevant to all disciplines (Table 1).

Tsui (1999), in her extensive study of the integration of critical thinking in college classrooms, found that the development of these skills is linked to an emphasis on writing and rewriting, classroom discussion, and active, hands-on learning. Writing assignments must emphasize analysis, synthesis, and evaluation (**2.2.1 Bloom's Taxonomy—Expanding its Meaning**). Rewriting should be encouraged to stimulate students to think more deeply about what they have written and to utilize feedback to improve it (**4.1.1 Overview of Assessment**). Tsui argues, "Writing is likely to exert a greater impact on student cognitive outcomes when it is stressed throughout the curriculum....Success in fostering critical thinking is in part contingent upon the degree to which faculty utilize writing assignments in their teaching." She recommends that instructors rely less on lecturing and emphasize classroom discussion because students are more likely to comprehend and retain ideas when they participate in a

discussion or debate them. Shaw (2000) similarly recommends the development of students' reading, writing, and presentation skills as a way to stimulate critical thinking in the classroom.

Strum (1998) describes how a well-designed "first-year experience" can provide a stimulating environment for intellectual growth, a firm grounding in inquiry-based learning, and improved communication of information and ideas. Pacific Crest's *Foundations of Learning* curriculum is another example of how to facilitate the growth of basic critical thinking skills.

Some classroom facilitation (***3.2.1 Overview of Facilitation***) tactics that encourage active learning are presented in Table 1.

Assessing Critical Thinking Performance

Educators (e.g., Tsui, 1999), recommend that writing assignments involving critical thinking should include a step-wise assessment process to raise the level of performance. The Bellevue University Critical Thinking Rubric (Table 2) provides a holistic way to set standards for assessment of critical thinking (***1.4.2 Fundamentals of Rubrics***) and can also be used to analyze classroom activities and assignments for their potential to raise the level of critical thinking performance.

Concluding Thoughts

Because multiple definitions of critical thinking are necessary to address the wide range of applications across disciplines and problem contexts, special care must be exercised in building models to fit specific uses of critical thinking. The metacognitive requirements for both learners and educators are substantial, which means that gaining expertise in critical thinking will take extended practice and assessment across many contexts and problem types. Educators often use written and oral responses to evaluate student critical thinking, so special attention has been paid in this module to show how one might enhance such responses. The limited clarity of its definition and the many strategies needed to enhance critical thinking make it a continuing challenge, but clearly critical thinking is at the heart of the higher-education experience.

References

Bonnett, M. (1995). Teaching and thinking and the sanctity of content. *Journal of Philosophy of Education, 29*, 295-309.

Cowan, J. (June, 1994). Research into student learning: Yes, but by whom? In S. Tornkvist (Ed.), *Teaching Science and Technology at Tertiary Level: Proceedings of the Conference of Royal Swedish Academy of Engineering Sciences* (pp. 51-59). Stockholm, Sweden.

Table 1 ***Tactics that Encourage Active Learning***
Source: Critical Thinking Consortium

Use the following tactics during class to ensure that students are actively engaged in thinking about the content. When students do not know when they will be called on, they are much more likely to remain alert and engaged in the learning process. Students should be routinely called upon to:

1. Summarize or put into their own words what the teacher or another student has said

2. Elaborate on what they have said

3. Relate the issue or content to their own knowledge and experience

4. Give examples to clarify or support what others have said

5. Make connections between related concepts

6. Restate the instructions or assignment in their own words

7. State the question at issue

8. Describe to what extent their point of view on the issue is different from or similar to the point of view of the instructor, other students, the author, etc.

9. Write down the most pressing questions on their minds. The instructor then uses the above tactics to help students reason through the questions

10. Discuss any of the above with partners and then participate in a group discussion facilitated by the instructor

Critical Thinking Consortium. (2003). Foundation for Critical Thinking (n.d.). *Tactics that encourage active learning*. Retrieved November 17, 2003, from <http://www.criticalthinking.org>

de Bono, E. (1995). *Mind power*. New York: Dorling Kindersley.

Education Policies Committee. (1997/1998). Critical thinking skills in the college curriculum. Retrieved November 17, 2003, from Chaffee College <http://www.academicsenate.cc.ca.us/Publications/Papers/Downloads/CriticalThinkingSkills.doc>

Ennis, R. H. (1993). Critical thinking assessment. *Theory into Practice, 32*, 179-186.

Glock, N. C. (1987). *Public policy and educational reform*. Paper presented at the 1987 Fall Conference of the Academic Senate of the California Community Colleges, Los Angeles.

Langer, E. (1997). *The power of mindful learning*. New York: Addison-Wesley.

McEwen, B. (November/December, 1994). Teaching critical thinking skills in business education. *Journal of Education for Business*, *70*, 99-103.

SECTION 2

Table 2   **Bellevue University Critical Thinking Rubric***

5. Master Thinker

  a. Risks trying to answer intractable, perplexing, and complicated questions

  b. Reinterprets the history of thought in the relevant area

  c. Redefines the assumptions and premises from which all valid reasoning must proceed in the relevant area

  d. Creates an original synthesis of diverse perspectives

  e. Reaches conclusions that others acknowledge as foundational for all subsequent reasoning in the relevant area

4. Advanced Thinker

  a. Tackles questions that arise from profound cognitive dissonance

  b. Challenges conventional, received wisdom responsibly in search of new perspectives

  c. Reaches original conclusions through creative and imaginative lines of reasoning; draws vital distinctions and creates new categories

  d. Internalizes contrary positions; makes the arguments of opponents for them

  e. Actively cooperates or collaborates with others to test and expand the universe of knowledge

3. Practicing Thinker

  a. Seeks the most reasonable answer among the several possible reasonable answers

  b. Delays judgment until a substantial range of relevant information is known and assessed; is able to admit ignorance or an inability to resolve an issue on the basis of evidence

  c. Constructs sound lines of reasoning based on a fair and accurate assessment of the evidence; examines his or her own presuppositions and assumptions

  d. Demonstrates a full understanding of opposing positions

  e. Is aware that the community of skillful thinkers will value an attempt to be reasonable and fair

2. Beginning Thinker

  a. Seeks to justify his or her position rationally, but with a limited sense of perspective

  b. Selects information that supports a particular perspective

  c. Reasons on the basis of personal goals or needs with limited assessment of personal bias

  d. Discounts opposing points of view after only cursory examination

  e. Believes that, given the same evidence, most people would arrive at the same conclusions

1. Egocentric Thinker

  a. Assumes that knowledge is perceived by everyone from a purely personal perspective

  b. Accepts limited facts and information as adequate for present purposes

  c. Uses reasoning only when one is defending the validity of ones's personal opinions

  d. Takes no interest in alternative points of view and is unaware of their significance

  e. Believes that merely stating his or her position is persuasive in itself

*Based, in part, on Paul & Elder (1999)

Norris, S. P., & Ennis, R. (1989). Evaluating critical thinking. In R. J. Swartz & D. N. Perkins (Eds.), *The practitioner's guide to teaching thinking series*, Pacific Grove, CA: Midwest Publications.

Paul, R. (2003). Draft statement of principles. *National Council for Excellence in Critical Thinking*. Retrieved May 28, 2004, from <http://www.criticalthinking.org/ncect.html>

Paul R., & Elder, L. (1999). *Miniature guide to critical thinking.* Dillon Beach, CA: Foundation for Critical Thinking.

Pithers, R. T., & Soden, R. (2000). Critical thinking in education: A review. *Educational Research, 42 (3)*, 237-249.

Shaw, V. N. (2000). Reading, presentation, and writing skills in content courses. *College Teaching, 47* (4), 153-157.

Strum, K. S. (1998). *Reinventing undergraduate education: A blueprint for America's universities.* Presented at the 1998 AACSP Continuous Improvement Symposium, Dallas, TX.

Tsui, L. (1999, November). *Critical thinking inside college classrooms: Evidence from four institutional case studie*s. Presented at the 24th Annual Meeting of the Association for the Study of Higher Education, San Antonio, TX.