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Critical thinking: implications for instruction

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The critical thinking movement is now at the forefront of educational reform in the United States and elsewhere. This major initiative seeks to transform education in all disciplines and at all levels. Although not new, the movement has gathered strength in recent years as a result of increasing concerns among employers, educators, and public officials that students are not learning the thinking and reasoning skills needed to manage the complexity of contemporary life. Indeed, many feel critical thinking ability (along with creative thinking) may well be the most important characteristic of the successful individual in the next century

Interest in critical thinking is not new among librarians. Even though library literature abounds with references to critical thinking, such references often lead only to brief discussions with imprecise definitions of the term. In part, this is due to the complexity and difficulty of understanding the controversies within the movement. These controversies center on three issues: the differences between the conceptions of critical thinking held by psychologists and philosophers; the confusion of critical thinking with an entire cluster of related thinking processes; and the extent to which critical thinking is generic or discipline specific. This column will review these controversies and then analyze their impact in the field of instruction.

Review of Critical Thinking Theory

The contemporary critical thinking movement is led by such thinkers as Richard Paul, Gerald Nosich, Diane Halpern, David Perkins, and Robert Ennis. Their work draws mainly on two traditions: philosophy and psychology. The philosophical tradition is focused on the norms of good thinking, the rational aspect of human thought (including the emotional dimension of critical thinking), and on the intellectual virtues needed to approach the world in a reasonable, fair-minded way.[1] The psychological tradition is more interested in thinking processes. This tradition looks at empirical studies of thought and thinking, expert-novice distinctions in learning complex ideas, and the problem-solving aspect of critical thinking. In spite of each tradition's differences, both are strongly interested in the motivational or emotional dimension of critical thinking, the assessment of critical thinking abilities, and in revolutionizing learning in schools through a restructured curriculum emphasizing critical thinking.

The critical thinking movement, however, has not been as successful as many of its leaders had hoped in achieving fundamental reforms in education. The second major controversy surrounding critical thinking perhaps accounts for much of the lack of practical implementation. This controversy surrounds the confusion of critical thinking with other concepts and the lack of a generally held definition of critical thinking.

Critical thinking is often identified with allied concepts such as problem solving, decision making, reasoning, informal logic, or simply thinking. Although these terms are often used interchangeably, experts employ them in quite different senses. Problem solving is ordinarily defined as the process of moving from an initial problem state to a solution, using generic heuristics or rules of thumb, or discipline-specific procedures. Problem solving narrows options and seeks to arrive at an optimal solution. Decision making involves weighing pros and cons of varying courses of action, guided by certain criteria, while reasoning entails seeking to reach conclusions starting with certain premises or information. Informal logic is the study of argumentation--the art of constructing and analyzing arguments using rules and criteria.

While all of these mental operations involve thinking, leaders in the critical thinking movement would insist that critical thinking is different from all of these related concepts and from mere thinking itself. The philosopher Paul, for example, believes that mere thinking is as natural as breathing;[2] while Perkins would agree that good thinking does not come naturally. Perkins, the psychologist, points out the artifice involved in good thinking as opposed to naturally occurring thinking.[3]

Definitions of critical thinking developed by theorists such as Paul, Ennis, Halpern, and others abound. Ennis defines critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do." [4] This famous one-sentence definition continues to offer a springboard for further discussion. Paul has developed the most elaborate definition and is not so concerned with a fixed, one-time definition. Most of his ideas concerning the concept, however, center on the idea of dialogical, multilogical reasoning using multiple perspectives with a strong insistence on critical thinking attributes such as fair-mindedness as well as standards and criteria for self-assessment. Paul's famous distinction between weak sense and strong sense critical thinking is, in fact, a telling example of his philosophical assumptions. Weak sense critical thinking is comprised of the sophisticated, but often sophistic, use of critical thinking microskills such as argument analysis, synthesis, and evaluation. In contrast, strong sense critical thinking possesses a disciplined, fair-minded, multilogical perspective on an issue or problem so that the reasoner is not trapped by egocentricity or self-deception.[5] Paul and Nosich have elaborated the entire concept of critical thinking further for the U. S. Department of Education and have developed a multipart definition for the National Council for Excellence in Critical Thinking Instruction.[6]

The third major controversy centers on whether critical thinking is in some sense generic and can be taught generically, or whether it exists and can be taught only within specific subject areas and disciplines. Ennis, McPeck, Perkins, and Paul have all analyzed this issue in depth. McPeck stands out from all critical thinking theorists because of his insistence that critical thinking is always about some subject, with the corollary that generic critical thinking skills cannot be taught because they do not exist.[7] Ennis and Perkins offer mixed evidence for both the generic and discipline-specific models of critical thinking. Perkins finds strengths and weaknesses in both models and suggests a synthesis or partnership between the two to combine the advantages of both.[8] Ennis has clarified some of the ambiguities inherent in the term "subject specificity" and points out models for teaching.[9]

Paul insists on exemplary elements, standards, traits, and skills of critical thinking that transcend specific disciplines or subject matters. Elements of critical thinking for Paul include purpose or goal, question at issue, assumptions, concepts, inferences, implications and consequences, and point of view. Exemplary standards of critical thinking include clarity, precision, accuracy, depth, adequacy, relevance, completeness, and fairness. In Paul's view, these

elements and standards apply to thinking well in all disciplines and in everyday reasoning as well. However, Paul's conception of critical thinking also includes examples of modes of reasoning specific to subjects and disciplines. He insists that students must learn to reason within the characteristic modes of thinking of the various fields of study; they should learn to reason historically, sociologically, psychologically, and biologically.[10] Paul's combination of the exemplary forms of critical thinking with the disciplinary modes of reasoning model, although an imperfect synthesis, is the most complete current explanation of how critical thinking should operate across disciplines and within them, and of how it should manifest itself in both academic study and everyday reasoning.

Critical Thinking and the Reform Movement

These controversies, however appropriate to the field of critical thinking, have not distracted these critical thinking experts from advocating fundamental reforms in teaching and learning. The themes of "best practices" for teaching and learning and assessment lead the reform movement. Modes of teaching and learning such as collaborative learning, problem-based learning, and other forms of active learning are vehicles that help develop critical thinking abilities. In keeping with much contemporary cognitive psychology, critical thinking leaders such as Paul and Perkins believe that students cannot be handed knowledge and be expected to understand it; they must instead construct meaning, reason matters through, and figure out issues and concepts for themselves. Various forms of active learning should be used to help students reason their way to genuine understanding. Richard Paul insists that active learning, collaborative learning, problem-based learning, and all other such instructional modes must be subject to standards and self-assessment. Otherwise, collaborative learning can become "collaborative mis-learning," active learning becomes mere activity for activity's sake, problem-based learning becomes an exercise in "authentic," real-life problem solving devoid of thinking standards.[11] Paul's caveats about spurious critical thinking programs (even those with active learning components) stand out from the voluminous writing on the whole concept. Insisting that critical thinking is multidimensional, consisting of cognitive abilities as well as dispositional or affective traits requiring sustained attention and self-assessment, is surely a sounder conception than any formulaic approach to teaching critical thinking.

The reform movement is also concerned with assessment. Appropriately assessing critical thinking depends a great deal on a well-defined conception of critical thinking. Paul and Nosich have developed a program for critical thinking assessment for the Schools 2000 project, which involves a combination of objective tests and essays. They have also developed a schema that contains specific examples of critical thinking elements, dispositions or traits, and standards.[12] They intend to provide as much specificity as possible so that instructors at all levels may develop local assessment programs based on well thought out standards. These standards detail the norms of good thinking rather than attempt to pinpoint specific thinking tasks that must be quantified.

However, much remains unknown and unresolved about critical thinking assessment. Paul and Nosich's approach is but one of a range of possibilities. Halpern has identified some of the key unresolved questions. These include the extent to which critical thinking skills change over the course of the individual's life span, the patterns of curricula most helpful in developing critical thinking, the extent to which individual learning styles and preferences influence the development of critical thinking, and what specific teaching techniques and learning

environments provide the best enabling conditions for critical thinking.[13] Assessment will remain a challenge because of the multifaceted nature of critical thinking itself

Implications for Instruction

In one sense, ideas about critical thinking seem too global, too removed from the specific skill clusters that most librarians would associate with learning to use the library. Some think only of a mechanistic, tool-based approach to library skills and will consider critical thinking outside the scope of their responsibilities. The proliferation of electronic tools such as CD-ROMs, network-accessible databases, and various software packages and the traditional print tools, reinforces the tendency to take a tool-based approach. One view advocated by librarians involves the teaching of "basic skills," which are seen as separate from critical thinking skills.

Contemporary bibliographic instruction has its own back-to-basics movement among some practitioners, similar to the back-to-basics movement in other educational arenas. One of the most articulate voices for this viewpoint is Cheryl LaGuardia, whose article "Renegade Library Instruction" has captured the interest and enthusiasm of many librarians. She emphasizes very practical, tool-oriented instruction and finds little value in more conceptual approaches to instruction. Her experience shows that her students benefitted more from learning the basic minimums, including orientation to the building, demonstrating the OPAC, and locating materials, all within one class hour. She acknowledges that this approach was developed because many students were totally unprepared for college-level research by their high schools, and due to budgetary shortfalls and social causes. She also believes that, too often, librarians want students to play by "big league" rules of understanding information structure and systems--rules she feels are appropriate only for reference librarians.[14]

If students cannot handle the rigors of college-level research projects, one cannot readily disagree with the back-to-basics movement in bibliographic instruction. In fact, university faculty continue to decry the lack of preparation of their students in a wide range of disciplines. Reference and instruction librarians who attempt to teach research skills with a critical thinking emphasis are likely to encounter the same difficulties as other faculty. However, this problem shows deeper problems with our entire educational system.

Instruction is not the only field with a back-to-basics movement. But, as Lauren Resnick points out, the back-to-basics approach is not based on the best thinking and research in contemporary cognitive psychology. There is reason to believe that critical thinking skills are essential from the very earliest years of education; that learning to read and write, speak and listen, all involve the development of cognitive abilities that transcend rote memorization or simple comprehension or application. [15] What is remarkable is the extent to which Paul, the philosopher, agrees with this particular perspective on basic skills taken by cognitive psychologists. On this topic, critical thinking experts from psychology and philosophy agree. Paul asserts that critical thinking skills permeate all of learning, and that the mind must always be an active instrument if it is to grow and change, that knowledge is an achievement gained by active participation of the learner. [16] In effect, all experts in critical thinking, psychologists and philosophers, agree that the facile distinction between basic skills and critical thinking skills ignores the way students gain knowledge and make sense of the world.

In the field of instruction, many believe critical thinking must come later, if at all, in the learning process. Oberman, Arp, and Jacobson have addressed this false dichotomy. In their views, skills must be linked to concepts and taught in context; learners should develop the ability

to move from parts to wholes; and the librarian should become a guide who helps students develop appropriate mental models for understanding new and complex information systems and environments.[17] Wesley points out the need for infusing critical thinking in bibliographic instruction throughout the research process--from initial question posing and topic analysis, through strategizing, and concluding with evaluation of sources.[18] Craver, Bodi, and Gibson are among others who have discussed the research process in similar, all-inclusive ways.[19]

Frances Jacobson has responded aptly to LaGuardia, pointing out that some elements of LaGuardia's own approach are informed by sound learning principles, such as learning-in-context. However, she identifies the crucial flaw in this approach, which is separating skills from concepts. Skills are usually tied to specific computers and search softwares, and teaching only skills creates a self-defeating situation where the student can't transfer any skill, knowledge, or competence across a variety of research problems.[20] The basic skills approach, in short, eliminates the possibility of real understanding of how information systems work in the interest of reducing "complexity."

The back-to-basics movement within instruction should be given credit for pointing out the very real, immediate, curricular needs for information that students and faculty have. The minimalistic approach to instruction is appropriate for some in certain situations. However, the critical thinking approach holds much greater promise for promoting greater autonomy in retrieving, evaluating, and managing information. The short-term, tool-oriented approach merely reinforces dependency because it does not seek to promote students' understanding of research questions, information systems, and their own information-seeking abilities and patterns. Teaching the basic skills while excluding teaching for understanding, which requires critical thinking on the part of instructor and students alike, perpetuates rote learning of rapidly proliferating and changing software tools. This is a very undesirable scenario for librarians who wish to be part of the educational mission of their institutions. Rather than simplicity, creating a new teaching and learning environment that empowers students, faculty, and librarians alike should be the goal.

Borrowing from the critical thinking experts, Paul's conception of critical thinking the best current model for challenging the basic skills approach because it elaborates critical thinking abilities in normative terms that can be applied in any domain, set of skills, or knowledge base--while acknowledging the domain-specific features of good thinking within specific disciplines. Paul's exposition of the basic concepts of critical thinking rests upon the following assumptions:

- Knowledge about anything cannot be given to students.
- Knowledge is an achievement gained only by figuring things out.
- The student must be actively engaged in the learning process.
- Multiple perspectives should be brought to bear upon problems when solving them.
- Students should learn standards for assessing the quality of their own thinking.
- Self-awareness and self-critique are attitudes at the very heart of critical thinking.

How do these assumptions apply to teaching information access abilities with a critical thinking approach? First, instruction programs offered by libraries need more time and prominence within the curriculum. Teaching any subject with a critical thinking emphasis means more, not less, time because critical thinking is reflective and takes time. Students can't be rushed into learning for understanding. Superficial coverage of much content almost certainly

diminishes the opportunity for critical thinking. This curricular challenge is especially acute for reference and instruction librarians in the 1990s. If we accept that critical thinking and reasoning about information systems are essential to understand those systems, however, we will need to teach these services and systems as part of a larger mental construct--the total information environment. Teaching the information environment or information landscape model will definitely require more time. Such teaching should de-emphasize the teaching of specific skills, focus on describing and elaborating that larger environment, and involve students in actively developing mental models of various components of that environment. Specific skills are best taught at the time and point of need. Technology and search engine design itself should carry more of the burden in the future for teaching tool- and skill-specific information. [21]

A second major implication of Paul's approach to critical thinking is that instruction needs to be re-invented to develop thinking standards in students. One of Paul's frequently emphasized themes is that much of what passes now for thinking skills instruction is spurious because students are not being taught the standards and criteria for assessing their own thinking. Active learning exercises in our instruction sessions, important as those activities are, do not assure that students will transfer what they learn in those sessions to real-life situations when they are searching CD-ROMs or various online services on their own. While active learning itself is extremely important in helping students develop accurate and flexible reasoning abilities, it must be accompanied by other exercises that ask students to assess and reflect on their own database selections, question analyses, search strategies, search tactics, and source evaluations. Following Paul's thinking, we should insist that the ability to develop a search strategy is not what matters (as important as that cognitive skill is); it's the ability to formulate a search strategy well, to know what makes a good search strategy and what makes a poor one, that must be taught. We want to develop students who are flexible reasoners and who have internalized some standards for assessing their own thinking about the information environment and their own search skills. These students are likely to be what psychologists call metacognitively adept learners--they reflect on their own thinking, pinpoint pitfalls in their search strategies and source evaluations, change strategies when appropriate, and improve their thinking over time. This quality control in thinking about search strategies and information resources is, perhaps, the most crucial need in our instruction programs currently. Students with internalized thinking standards will be more discriminating searchers and users of information and will also avoid what Oberman calls the cereal syndrome--that sense of being overwhelmed by too many information choices. [22]

The critical thinking movement, and the key ideas of Paul, offer a new paradigm for our instruction programs. Developing the curricular content and structure, and all the related implementation issues, are large issues that should be widely discussed and debated as we move into the next century and an almost certain era of more complexity, ambiguity, and information superabundance.

Most often asked questions about critical thinking as applied to information access abilities:

1. Is critical thinking to be equated only with evaluation of sources?

Certainly not. Critical thinking applies throughout the research process. The researcher must begin by posing a good research question and must use critical thinking skills to know what is a good question (similar to the concept of problem finding discussed by Perkins). [23] He or

she must plan a flexible strategy or set of strategies that uses a variety of tools to locate information; the searcher must bring some disciplined thought to bear on developing the strategies and must make informed choices about tools and sources to use. Initial search results from databases must be screened with an eye for relevance, authoritativeness, and appropriateness. This, again, involves making informed choices. Further evaluation of the information must follow in greater depth, using criteria and good judgment. Ideally, the searcher will conclude with self-questioning about better ways of conducting the research next time, with development of appropriate standards for making better choices throughout the entire process.

2. Can critical thinking be realistically taught in one-shot BI sessions? If not, how is it best taught?

Critical thinking must be taught across the curriculum, in many different settings, over a sustained period for real changes in students' thinking to occur. One-shot BI sessions offer a limited opportunity for feeding into that larger curricular emphasis and are more likely to be successful if they are offered within the confines of a course in which the instructor uses critical thinking teaching approaches throughout the course.

3. Can we assume that students will automatically engage in critical thinking when they use electronic tools such as OPACs and CD-ROMs?

Not very likely. The magical effect of technology is too strong. Students and many others lack sound mental models of databases and therefore make incorrect assumptions about the content and structure of databases. They also anthropomorphize computers and do not see them as mere tools that they must bring critical thought to in order to use them well. The solution? Instruction using conceptual frameworks about the nature of databases and software, linked with discipline-specific assignments, coupled with a repertoire of strategies for demystifying the supposed oracular nature of computers. Another extremely useful possibility is advocated by Jacobson and Martin: enhancing online catalog records with additional contextual information to help students evaluate what they see on screen [24]--though again, we can't assume that critical thinking will be the usual response. Critical thinking instruction about various technologies and databases should be explicit, deliberate, and engage students in evaluative thinking.

4. Is critical thinking generic or discipline specific in BI?

If we take Paul's conception of critical thinking seriously and apply it to BI, we will see the need for a combination of generic and discipline-specific critical thinking. We will assume that BI is a discipline, though not in the privileged sense of more traditional disciplines. At the 1994 ALA Annual Conference, Gerald Nosich delivered a keynote address on critical thinking in which he made the humorous point that librarians should follow Paul's admonition that students must learn to think "historically, biologically, etc." and therefore teach students to think "libraryly." [25] This wry coinage contains a great deal of practical wisdom. Learning to think "libraryly" involves the discipline of using research concepts in an informed way, using the library and other information sources as a system of ways organized in certain logical patterns. In this sense, learning library research methods constitutes a discipline of study.

5. Is it possible to teach critical thinking skills in an information environment characterized by multiple user interfaces and rapidly changing technological developments?

Yes, but only if we move past the mechanistic, tool-based model that is fixated precisely on teaching the plethora of user interfaces (which change often) as if the mechanics are the core of learning information skills. Learning to question well, reason out research problems, predict with confidence the location (or even the existence) of information, as well as evaluating the information found--these are the core skills.

6. How can we assess whether students are learning to think critically in using library and information sources in general?

A combination of methods will be necessary, including classroom-based research, ethnographic, longitudinal studies (Carol Kuhlthau's research exemplifies this approach), evaluation of student journals, papers, and bibliographies, and think-aloud protocols.[26] These are labor- and time-intensive assessment methods. Sampling and selectivity will be essential.

7. How can we create a critical thinking environment for BI?

The most important single change librarians can make is to become reflective practitioners in whatever their area of specialization happens to be. When librarians become critical thinkers and demonstrate critical thinking abilities and traits, interactions with students reached through instruction programs will become more reflective and oriented toward critical thinking. Obviously, more time for BI must be included in the curriculum and in specific courses. We must use technologies such as multimedia appropriately rather than as a substitute for critical thought; and the entire curriculum must be restructured to create an environment where critical thinking is going on all over campus--in lectures and discussions, in library study rooms, and in whatever setting where discussion is possible. Of course, students modeling critical thinking for other students has an extremely powerful effect. If we can use students in our instruction programs to model this kind of behavior, it's quite possible that we will see a multiplier effect. Transforming the teaching and learning environment from didactic certainties to open-ended, critical thinking responses and discussion requires a large cultural change on most campuses. Librarians can help with that change by insisting on critical thinking as an integral part of library services planning, and in all instruction and outreach programs.

REFERENCES

- [1.] Richard W. Paul, *Critical Thinking: How to Prepare Students for a Rapidly Changing World* (Santa Rosa, CA: Foundation for Critical Thinking, 1992), 547.
- [2.] Richard W. Paul, "The Logic of Creative and Critical Thinking," *American Behavioral Scientist* 37 (Sept. 1993): 21, 22.
- [3.] David N. Perkins, "Thinking Frames," *Educational Leadership* (May 1986): 4-10
- [4.] Robert H. Ennis, "A Taxonomy of Critical Thinking Dispositions and Abilities," in *Teaching Thinking Skills: Theory and Practice*, ed. by Joan Boykoff Baron and Robert J. Sternberg (New York: Freeman, 1987), 10.
- [5.] Paul, *Critical Thinking*, 383-93.
- [6.] *Ibid.*, 103-51.
- [7.] John McPeck, *Critical Thinking and Education* (New York: St. Martin's, 1981).
- [8.] David N. Perkins and Gavriel Salomon, "Are Cognitive Skills Context-Bound?" *Educational Researcher* 18 (Jan./Feb. 1989): 16-25.

- [9.] Robert H. Ennis, "Critical Thinking and Subject Specificity: Clarification and Needed Research," *Educational Researcher* 18 (Apr. 1989): 4-10.
- [10.] Paul, *Critical Thinking*, 204-05.
- [11.] See, for example, Paul, *Critical Thinking*, xiii, 95.
- [12.] Paul, *Critical Thinking*, 123-31.
- [13.] Diane F. Halpern, "Assessing the Effectiveness of Critical-Thinking Instruction," *The Journal of General Education* 42, no. 4 (1993): 238-54.
- [14.] Cheryl LaGuardia, "Renegade Library Instruction," *Library Journal* 117 (Oct. 1, 1992): 51-53.
- [15.] Lauren B. Resnick, *Education and Learning to Think* (Washington, DC: National Academy Pr., 1987), 8.
- [16.] Paul, *Critical Thinking*, 222.
- [17.] See, for example: Cerise Oberman, "Avoiding the Cereal Syndrome," *Library Trends* 39 (Winter 1991): 189-202; Lori Arp, "An Introduction to Learning Theory," in *Sourcebook for Bibliographic Instruction* (Chicago: ALA, 1993), 5-15; Frances F. Jacobson and Michael J. Jacobson, "Representative Cognitive Learning Theories and BI: A Case Study of End User Searching," *Research Strategies* 11 (Summer 1993): 124-37.
- [18.] Theresa Wesley, "Teaching Library Research: Are We Preparing Students for Effective Information Use?" *Emergency Librarian* 18 (1991): 23-30.
- [19.] See, for example: Kathleen Craver, "Critical Thinking: Implications for Research," *School Library Media Quarterly* 18 (Fall 1989): 13-19; Sonia Bodi, "Critical Thinking and Bibliographic Instruction: The Relationship," *Journal of Academic Librarianship* 14 (July 1988): 150-53; Craig Gibson, "Alternatives to the Term Paper: An Aid to Critical Thinking," in *Integrating Library Use Skills into the General Education Curriculum*, ed. by Maureen Pastine and Bill Katz (Binghamton, NY: Haworth, 1989):297-309,
- [20.] Frances F. Jacobson, "Relating Skills to Concepts," [letter to editor] *Library Journal* 117 (Dec. 1992): 8.
- [21.] Lori Arp, "Reflecting on Reflecting: Views on Teaching and the Internet," *RQ* 34 (Summer 1995): 453-57.
- [22.] Oberman, "Avoiding the Cereal Syndrome, 189-90.
- [23.] Perkins, "Thinking Frames," 195.
- [24.] Trudi Jacobson and Lynne M. Martin, "Merging Critical Thinking and the Electronic Library: A Visionary Perspective of SuperPAC, an Enhanced OPAC," *Research Strategies* 11 (Summer 1993): 138-49.
- [25.] Gerald Nosich, address given at ACRL/BIS Annual Program, "Beyond the F1 Key: Thinking and Teaching the Internet within the Curriculum, at the American Library Association Annual Conference, Miami Beach, FL, June 27, 1994.
- [26.] Carol Collier Kuhlthau, *Seeking Meaning: A Process Approach to Library and Information Services* (Norwood, NJ: Ablex, 1993).