Critical Thinking in Higher Education:
An Annotated Bibliography

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An overwhelming number of books and full-text articles on various databases are available that suggest ways to teach critical thinking. Most educators agree that this skill is becoming increasingly important as classes become more diversified and the curriculum becomes more global. An institution's library is an often-overlooked faculty development resource; this article offers relevant articles on critical thinking from the many databases available through Park University's McAfee Memorial Library, such as:

- EbscoHost: searches a wide range of magazines, many full-text, peer reviewed;

- Infotrac One File: master file of academic, general, and business periodicals;

- Lexis-Nexis: searches news, business, legal, medical, and general reference;

- ProQuest: includes many professional business and general reference periodicals and newspapers;

- Sage: 1.Full-text Communication Studies 2.Full-text Criminology 3. Full-text Political Science and 4. Full-text Sociology;

- Wilson Web: Full-text, abstract, and index databases for education and social sciences.

Most databases allow for full-text searching by subject, title, author, or keyword. Some databases, such as Sage, will even create a bibliography of selected articles using APA, MLA, or other recognized styles. These databases can be searched in the library or computer labs in addition to the faculty member's home, making it easy for faculty to review scholarly resources at their leisure.

Following are annotations for a number of scholarly articles related to the promotion of critical thinking in the higher education classroom.

Acker, J.R. (2003, Autumn). Class acts: Outstanding college teachers and the difference they make. *Criminal Justice Review,* 28 (2), 215-231. Retrieved April 12, 2006, from Criminology: A SAGE Full-Text Collection database.

> Acker's research about outstanding college teachers includes reflections of instructors deemed outstanding by their students. These students agreed that their favorite, most memorable teachers were demanding—insisting on high standards. Acker states there are no set rules for being an effective educator; however, most "good" teachers:
>
> - possess a passion for teaching,
> - relate to what the students already know,

- are challenging, but caring,
- inspire students,
- are organized and knowledgeable,
- ask important questions that encourage critical thinking and problem solving,
- desire that students learn by discovery, not recall.

The research review also revealed that excellent teachers use humor effectively in the classroom, in addition to reaching out to students outside the classroom by inviting them to their homes. As busy as these educators were, all instructors deemed effective were also scholars taking time for research and writing, which they felt enhanced their teaching. No matter what subject was taught, the instructors encouraged the students to question, think critically, and solve problems. Excellent teachers promote critical thinking by their questions; by encouraging students to think and ask questions; and by allowing students to discover information and make decisions to solve problems.

Braun, N. M. (2004, March/April). Critical thinking in the business curriculum. *Journal of Education for Business,* 79 (4), 232-236.

Critical thinking is important in all classes, but researcher Nora Braun of Augsburg College in Minneapolis, Minnesota, points out that in the business world making decisions is a daily occurrence. How can we teach students to sort through information and make important decisions? Many scandals in the news today, such as the Enron fiasco, provide much fodder for discussions on business ethics and decision making. Discussions, debates, and guided questioning are some of the techniques used in business courses to classify and evaluate the enormous amounts of information available. Instructors need to provide active learning activities to help students practice critical thinking. Transferring these skills from one class or discipline to another is a worthwhile goal. Students can be taught to identify problems and classify the information to make intelligent decisions. The business curriculum needs to clearly state the critical thinking skills that are being taught and assess the improvement of these skills. This is not an easy task, but the fast-paced environment of the business world demands executives and workers who can handle vast amounts of information and make thoughtful decisions quickly.

Burbach, M., Matkin, G., & Fritz, S. (2004). Teaching critical thinking in an introductory leadership course utilizing active learning strategies: A confirmatory study. *College Student Journal,* 38(3), 482-493. Retrieved Thursday, April 20, 2006 from the Academic Search Elite database.

Educators across time have disagreed on the definition of critical thinking. Socrates, Plato, and Aristotle encouraged students to realize that things were often not what they seemed to be. Dewey proposed that "critical thinking involved the suspension of judgment and healthy skepticism." Ennis argued that students need assistance to be reflective, reasonable and should be directed on what to believe or do. A panel of experts, the Delphi Project, determined this definition (in part): "We understand critical thinking to be a 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 was based."

Despite these differences of opinion, however, educators agree about the value of critical thinking enough to teach courses that feature it as the

main goal and content matter. This study was conducted to answer the question, "Are critical thinking skills increased in an introductory level college leadership course that encourages active learning?" The Watson-Glaser Critical Thinking Appraisal (WGCTA form B) was used to collect data from 80 students at a Midwestern university. Pre- and post-assessment tests revealed that active learning techniques appear to increase critical thinking. Researchers found that college students have higher critical thinking skills than non-college students and their abilities increase with their education level. Increasingly, potential employers place a high priority on this skill set in discipline-based courses.

Burbach's review of the literature includes various research findings on some of the following learning methods: service-learning projects, journal writing, small groups, scenarios, case studies, and questioning.

Elder, L. (2004, Winter). Diversity: Making sense of it through critical thinking. *Journal for Quality and Participation,* 27(4). 9-13.

Dr. Linda Elder, an educational psychologist and president of the Foundation for Critical Thinking, has led many seminars on critical thinking for administrators and professionals. Her experience as a seminar leader suggests that many prospective teachers are neither taught to think critically nor taught how to get their students to think critically. She concludes that:

- All content must be "reasoned through" to be learned.
- All reasoning involves predictable parts or elements.
- All elements of high quality reasoning presuppose universal intellectual standards.

The primary barrier to good reasoning is native egocentrism. Problems arise because individuals are often conditioned to value certain people or groups differently. Critical thinking helps students learn that the ideologies of all groups, even our "own," must be analyzed and assessed. By questioning different viewpoints, students can develop the intellectual integrity needed to evaluate the reasoning of others.

Since no teacher can take into account all aspects of diversity or possibly teach "everything," what does one include and what does one omit? Elder states that the solution to this dilemma is critical thinking. Faculty should concentrate on teaching students the basic critical thinking skills to reason through myriad issues if lifelong learning is to be promoted.

Halpern, D. F. (1999, Winter). Teaching for critical thinking: Helping college students develop the skills and dispositions of a critical thinker. *New Directions for Teaching and Learning,* No.80, 69-74.

In her review of the literature Diane Halpern, a professor of psychology at California State University, refers to many educators and their opinions of critical thinking. Most agree that critical thinking is a purposeful, reasoned, and a goal directed method of solving problems and making decisions. Halpern states that the vast amount of material available on the Internet increases the need to teach critical thinking skills to evaluate information. Students need (1) *instruction*, as well as the (2) *disposition* to use these skills. Halpern proposes a four-part model to teach critical thinking—which includes the two parts mentioned as well as (3) *structure training* to help students recognize when a certain thinking skill is needed and (4) *metacognitive monitoring* or the ability to reflect on thinking processes.

The concept of student disposition is particularly interesting. A student not only needs to know skills but be willing to use those skills. Instructors need to employ a variety of methods to engage students in applying critical thinking skills. As one pedagogical suggestions, Halpern recommends utilizing the professional Web sites associated with individual disciplines, many of which offer free activities that promote critical thinking skills.

Lauer, T. (2005, May-June). Teaching critical-thinking skills using course materials: A reversal of roles. *Journal of College Science Teaching*, 34(6), 34-37. Retrieved full-text from Wilson Web Education Full-Text April 21, 2006.

Thomas Lauer, an associate professor in the Department of Biology at Ball State University, taught a class of 94 freshman biology majors. His introductory activity during the first day of class laid the foundation for the course's focus on critical thinking concepts. His activity was simple: He held up an index card and asked,

1. "What color is this?"
2. "Why is it white?"
3. "How would you change the color to blue?"

Each question required increasing levels of comprehension and application to arrive at an answer. Lauer followed this method daily with similar critical thinking questions. Although this was a large lecture group, he accomplished this by having a question of the day and dividing the large group into four smaller groups to discuss. Students wrote their answers on an index card, which he collected to assess progress in critical thinking. Lauer found that it is possible to teach *thinking* at a higher lever in the classroom using course content material. On one of the semester course evaluation questions, "What was the most important thing you learned in this class?," all students thought that the thinking skills learned were as important as the course content material.

Oritz, A.M. (2000, Summer). Expressing cultural identity in the learning community: Opportunities and challenges. *New Directions for Teaching and Learning,* No.82, 67-79*.*

Anna Ortiz is an assistant professor in the Department of Educational Administration at Michigan State University. In her research, she confronted the dilemmas of dealing with a wide variety of differences in the classroom. As a Mexican-American she has a different background than many faculty members. She concludes that the interaction of different cultures of students and instructors produces a cultural identity. Clashes may arise when people do not understand the importance of the values of those whose background is different from theirs. Students who feel free to express themselves in the classroom examine not only their own culture but the culture and values of those around them.

Ortiz builds "classroom communities" by engaging the students in classroom discussions that involve personal information about themselves and their values and cultures. These assignments ask for their perspectives and experiences in relation to course content. Grouping students with different backgrounds adds to cultural awareness. Ortiz advises instructors to be patient and allow students to express their opinions freely. By learning more about each other and their values and cultures, students learn to accept or question those of others. The trust built in the diversified classroom allows students and instructors to discuss differences

productively; to see another point of view; and to make decisions based on information gained from honest discussions.

Paul, R. and Elder, L. (2003, Spring). Critical thinking: Teaching students how to study and learn. (Part III). *Journal of Developmental Education,* 26 (3). 36-37.

Richard Paul, director of research and professional development at the Center for Critical Thinking at Sonoma State University, Rohnert Park, California, has written extensively in the field of critical thinking. He and Linda Elder have co-authored many articles on critical thinking which "prove" by polls and surveys taken that educators generally do not know what critical thinking is, or how to teach it. Three templates provided in this article are well written and would be beneficial in most classes. They help students analyze the logic of articles, essays, or chapters. Each template consists of eight questions asking the main purpose, the key question, the most important information, the main references or conclusions, the key idea, the main assumptions of the material, the implications, and the main point of view. By using these templates when reading an article or chapter, students will better understand critical thinking as a process that enables them to identify and evaluate information. Specifically, a critical thinking approach to reading equips students to know:

- how to analyze the logic of an article, essay, or chapter
- how to figure out the logic of a textbook
- how to evaluate an author's reasoning.

The authors focus on critical thinking as a process and encourage readers to work through the templates so they can help students learn to analyze and assess information in written materials. These techniques could easily be transferred to other topics or disciplines.

Robinson, C.F. and Kakela, P.J. (2006, Winter). Creating a space to learn: A classroom of fun, interaction, and trust. *College Teaching,* 54(1) 202-206. Retrieved full-text from Wilson Web Education Full-Text, April 10, 2006.

The authors, team-teaching an introductory core course in environmental studies at Michigan State University, were pleased at the end of the year to have this response from an undergraduate student: "Thanks for a great class. Few courses evoke sadness for me when they end. Yours did." How did they achieve this? They designed the class so that students would have fun by learning from each other and the instructors in a trusting environment. From the beginning, the students were encouraged to share experiences and get to know one another. Newspaper articles about environmental issues sparked discussions. One picture of a child on the beach resulted in many descriptions—some students felt joy, some sadness that the child was alone, some wondered if the water were too polluted for swimming. The class paired off and shared their thoughts about the pictures. By the end of the first class, students had "given a brief oral report, written a short paper, reflected on why they chose the class, thought about who they were and what they valued, and made new friends."

The instructors used various techniques to keep the class interesting. One day they showed a video about design and had pizza and soft drinks. Then the question, "Can you design an environmentally-friendly pizza box?" (On the Michigan State University Campus discarded pizza boxes are the number one cause of solid waste.) Students were made aware of global

warming and other national environmental issues but by visiting the football stadium and the electric power generation station on campus as well as nearby wetlands they learned of problems close to home. Learning outside the classroom can be incorporated into most classes: psychology classes could go to a mental institution and education students could visit nearby schools, for example.

St. Clair, R. (2004, Summer). Teaching with the enemy: Critical adult education in the academy. *New Directions for Adult and Continuing Education*, No.102, 35-43.

Author Ralf St. Clair, scholar in residence with the Canadian National Literacy Secretariat, makes a distinction between critical thinking and critical pedagogy. He feels strongly that critical pedagogy is associated with education of children rather than adults. He refers to his research in the context of academic life as *critical teaching,* where the role of education is a change process that challenges common sense and makes one aware of oppression. In theory, educators can put forth radical ideas, but publishing and acquiring grant funds are more apt to secure one's job. St Clair's advice: "the trick to academic survival is to be critical—but not too—critical and never to critique the academy itself." The act of critical teaching is challenged by the increasing demands of accountability. However, by allowing students to rationally analyze factors that affect their lives. St. Clair sees this as a jigsaw puzzle: The different experiences show the big picture—which will be different each time you have different students with different beliefs. Do instructors have the right to try to make students think as they do? Professors must be aware of the power inherent in their positions and recognize oppression from both sides.

St. Clair questions grading and thinks that most critical educators do also, but he deems it necessary to account for the differences in quality of work. How does one access work that expresses views that are different from our own? What if the instructor assigns too many A's? (Can't everybody earn an A?) Critical teachers need to keep up the spirit of critique by pushing for change and challenging the power structures between teachers and students, even if that means that we, the instructors, are sometimes the enemy.

Tremblay, K.R., Jr., Downey, E. P. (2004, Summer). Identifying and evaluating research-based publications: Enhancing undergraduate student critical thinking skills. *Education,* 124 (4), 734-740.

Researcher Kenneth Tremblay from the Department of Design and Merchandising and School of Social Work, Colorado State University, reports on 80 undergraduate students who took a research methods course in spring 2003. A series of questions were provided to students who started with an idea, gathered research based publications, read the literature and evaluated the literature. Critical thinking skills were developed while evaluating the research literature, as well as inductive and deductive logic reasoning skills. Students were encouraged to print only relevant information so as to conserve paper. They were also taught correct citing of an Internet source using APA guidelines. Various sets of questions were provided for Internet sources, popular sources, trade magazines, proceedings of meetings of professional associations, scholarly journals in the student's field of study and those scholarly journals outside the student's field of study, as well as theses and dissertations. Time was spent in the library with a research librarian to evaluate books and the reputation of the publishers. There were classroom lectures, application exercises in the classroom and library, and student presentations and testing.

Tremblay reports that students valued the class and felt they were ready to conduct their own original research. Added benefits that the students shared were bonding with other students when visiting the library together as well as from the discussions and student presentations in the classroom.

Vanderburgh, P.M. (2005, September). Open-book tests and student-authored exam questions as useful tools to increase critical thinking. *Advances in Physiology Education,* 29(3), 183-184.

Paul Vanderburgh from the Health and Sport Science Department of the University of Dayton, Dayton, Ohio, researched the use of open-book tests and exam questions by students after complaints that the lecture portion of a class for first- and second-year students in allied health, physical education, sports management or exercise science needed an evaluation that promoted more active learning. According to literature reports, students benefit because they have an awareness of the learning process and mastery of the material. For one section of 42 students, the researchers implemented the Open-Book Exam Student Authored Question (OBESAQ) approach to evaluation This semester-long course had three open-book/notes exams and required students to frame one or two test questions per chapter for a total of eight sets of student-authored exam questions for homework. Student evaluation of the OBESAQ included these questions:

- What elements increased your knowledge and /or understanding?
- What elements of this course need improvement?

This method was found to promote more active learning and emphasize writing skills. Thus it would appear that open-book exams and student-authored exam questions seem to cultivate critical thinking.

Vanderburgh reported that some of the limitations of open-book exams included the excessive amount of time needed to look for answers, student anxiety, and being unprepared to take the test. Faculty spent a lot of time preparing and grading exams. This was especially true of open-book test construction for faculty who were inexperienced or not fully trained.

Although it does require time for preparing and grading exams, faculty felt that the emphasis on students writing and engagement in active learning made this a beneficial and worthwhile approach to teaching a higher level of critical thinking.

Williams, R.L. (2005,Winter). Targeting critical thinking within teacher education: The potential impact on society. *The Teacher Educator,* 40 (3), 163-187. Retrieved full-text on Wilson Web Education Full-Text, April 10, 2006).

The author's statement that critical thinking in teacher education could potentially increase society's effectiveness in addressing national and international problems sounds far-fetched when first heard, but one can easily understand that the lack of critical thinking within teacher education could certainly have a negative effect on problem solving. New approaches need to be consistent and start at an early age.

Williams makes reference to Halpern's critical thinking model as well as other instructional models. The importance of questioning is stressed, both by the instructor (TeachQuest) and having students frame questions

(ReQuest) that relate to the text. Examining pros and cons of an issue helps students see all sides of controversial issues. Students who learn to question the status quo as well as authority figures and become skilled in these discussions will model and teach their students to think critically. Everyone needs to notice or be aware of questioning both the written and the spoken word.

Other Readings of Interest Available at The Park McAfee Memorial Library

Brookfield, S.D. (1997, Fall). Assessing critical thinking. *New Directions for Adult and Continuing Education,* No. 75, 17-29.

Macpherson, K. (September, 1999). The development of critical thinking skills in undergraduate supervisory management units. *Assessment & Evaluation in Higher Education,* 24(3), 273-284.

New Directions for Community Colleges (Summer 2005 volume) is devoted to critical thinking.

Paul, R. and Elder, L. (2005, Fall). Critical thinking…and the art of substantive writing.(Part I). *Journal of Developmental Education.* 29 (1). 40-41.

---. (2006, Spring). Critical thinking…and the art of substantive writing, (Part II). *Journal of Developmental Education,* 29 (3). 38-39.

---. (2003, Fall). Critical thinking: Teaching students how to study and learn. (Part IV). *Journal of Developmental Education*, 27 (1) 36-37.

---. (2003, Winter). Critical thinking…and the art of close reading
(Part I). *Journal of Developmental Education.* 27 (2). 36-37, 39.

---. (2003, Winter). Critical thinking…and the art of close reading
(Part II). *Journal of Developmental Education,* 27 (3). 36-37. (2004, Spring).

---. (2003, Winter). Critical thinking…and the art of close reading
(Part III). *Journal of Developmental Education,* 28 (1). 36-37. (2004, Fall).

---. (2003, Winter). Critical thinking…and the art of close reading
(Part IV). *Journal of Developmental Education,* 28 (2). 36-37. (2004, Winter).

Shriner, reference librarian, has been a faculty member at Park University since 1996. After earning a BA at Emporia State Teacher's College, she taught elementary school. In 1991 she received her MLS from Emporia State University. She worked in medical libraries prior to coming to Park University. She has also taught SS100—New Student Seminars. Research interests include information literacy and critical thinking.