Critical Thinking and the Internet

Arsham, H. (2002). Impact of the internet on learning and teaching. *USDLA Journal*, *16*.

Considers the impact of the Internet and online courses on learning and teaching. Topics include cost-benefit issues; learning styles; teaching styles; satisfying student needs; continuous evaluation for quality assurance; technological issues; active learning and collaborative learning; interactivity; and online course content.

Astleitner, H. (2002). Teaching critical thinking online. *Journal of Instructional Psychology*, *29*, 53-76.

Critical thinking is a higher-order thinking skill that mainly consists of evaluating arguments. It is a purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanations of the evidential, conceptual, methodological, or contextual considerations upon which the judgment is based. As, for several reasons, critical thinking is not integrated within traditional classroom instruction, it is an interesting question, whether critical thinking can be trained with computer-based instruction (CDROM- and web-based teaching). Within a first part, the presented paper offers a narrative literature review on the effects of cognitive tools, of collaborative computer-supported environments, of computer simulations, and of logic-software on critical thinking. Within a second part, two experimental studies are reported. Students were instructed in critical thinking by web-lectures. In experiment 1, one group of students was confronted with audio recordings and another group with video recording of a lecture dealing with non-formal errors in arguments. Within both groups, about one half of students was presented synchronous organizers (text, figures, etc. on MS-Powerpoint slides), and the other half of students did not get such organizers. Results showed that synchronous organizers influenced subjective evaluations of the learning process and outcome. The modality of the recordings influenced learning transfer favoring the audio condition. In experiment 2, an audio web-lecture with synchronous organizers was compared with traditional text-based instruction. Results showed no differences in scientific analytic reasoning. Discussions were based on cognitive and motivational principles of multimedia learning.

Browne, M. N., & Freeman, K. (2000). Distinguishing features of critical thinking classrooms. *Teaching in Higher Education*, *5*, 301-309.

Proposes that classrooms that encourage critical thinking possess distinguishing features that can assess whether critical thinking is a regular occurrence. Suggests that a critical thinking classroom commonly reflects the following attributes: frequent questions, developmental tension, fascination with the contingency of conclusions, and active learning. These attributes reinforce each other to provide developmental stimuli for enhanced critical thinking.

Browne, M. N., Freeman, K. E., & Williamson, C. L. (2000). The importance of critical thinking for student use of the internet. *College Student Journal*, *34*, 391-398.

Argues that students are becoming so dependent on the Internet for their information that critical thinking programs that do not address the form and quality of persuasion on the medium are flirting with an anachronistic pedagogy. The author documents the absorption of postsecondary students with the Internet as a source of "knowledge," spells out the attendant dangers, and suggests the essential first step in applying critical thinking to the Internet. It is concluded that if students are going to rely on the Internet to the extent that it seems they do and will, renewed attention to applying critical thinking to the Internet is mandated.

Brown, M. (2002). Multicultural education and technology: perspectives to consider. *Journal of Special Education Technology*, *17*, 51-55.

The Internet and other educational technology tools can help educators to bridge the digital divide when incorporated and conceptualized within a sound multicultural education (MCE) framework. For this to happen, however, it is necessary for special educators to increase their efforts to critically analyze the Internet as an educational medium and to examine ways educational technology serves to further identify social, cultural, and educational "haves" and "have-nots." Moreover, the use of technology must be critically analyzed using a MCE framework to identify the gaps created by access or lack of access and the manner of use by various social identity groups. Because the integration of MCE into educational technology can be integral to the closing of the digital divide for certain students, the manner in which educators critically analyze all aspects of their educational and instructional technology use for its effects on student learning and engagement is also integral to closing that gap.

Collison, G., Elbaum, B., Haavind, S. & Tinker, R. (2000). *Facilitating online learning: effective strategies for moderators*. Madison: Atwood Publishing.

This book, aimed specifically at new or relatively new facilitators of online education or training courses, is a guide to learning the ground-breaking techniques and skills necessary to effectively facilitate online dialogue, community, and ultimately, education. The book offers a theoretical framework and practical guidelines to help online moderators meet the challenges of starting and sustaining quality dialogue in online courses or working groups. The system of voices and *critical thinking* strategies outlined in the book provides an effective and adaptable set of pathways for both analysis of dialogues and composition of interventions so that moderators can leverage more focused or deepened attention toward the objectives of any virtual community. Many of the facilitation skills for the online venue, described in this book, are also suited for face-to-face dialogue. Chapters include, (1) "Principles that Support Effective Moderating"; (2) "Negotiating Space: Forms of Dialogue and Goals of Moderating"; (3) "Key Facilitator Roles"; (4) "Healthy Online Communities"; (5) "Voice"; (6) "Tone"; (7) "*Critical Thinking* Strategies"; and (8) "Roadblocks and Getting Back on Track." An Epilogue, "Evaluation of Success," and a glossary are also included. (Contains 16 references.)

Granic, I. & Lamey, A. V. (2000). The self-organization of the internet and changing modes pf thought. *New Ideas in Psychology*, *18*, 93-107.

This paper explores the social-cognitive implications of Internet participation. Our central argument concerns the reciprocal relationship between the self-organization of the Internet and the cognitive and social development of individuals who participate in that system. We begin by providing a brief historical trajectory of the Net and discuss the self-organizing properties that explain its evolution. We go on to discuss how participating in this self-organizing system may give rise to changes in comtemporary modes Of thought changes on the order of those that Occurred during the birth of modernism after the advent of the printed word. Five specific changes are suggested: (1) the shift from essentialist thinking towards a sense of perpectivism, (2) the development of contextualized critical thinking skills, (3) the emergence of a meta-cognitive representation of the self as a network of identities, (4) an increase in cognitive flexibility, and (5) the development of efficacy beliefs. All five modes of thought are shown to be fundamentally linked to the self-organizing nature of the Net and to correspond to the postmodern themes of perpectivism, multiplicity, and decentralization.

Kao, K. N. (2002). Levels of cognition of instruction and of students' reflective thinking in a selected web-enhanced course. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *62* (8-A), 2672.

The development of cognitive instruction, critical thinking , higher level of thinking and problem solving ability in students has been of great concern in the recent past. One way to examine the quality of instruction is to assess the cognitive levels of the teaching and students' reflective thinking. The purpose of this study was to describe the cognitive level of instruction and students' reflective thinking of a selected web-enhanced course at The Ohio State University. The target population for the study consisted of a web-enhanced course at OSU and thirteen graduate students who were enrolled in this course during the Spring Quarter of 2001. In this study, the modified version of Newcomb and Trefz's taxonomy was adopted to assess the cognitive level of teaching and students' reflective thinking. Based on Bloom's taxonomy, Newcomb and Trefz (1987) developed the modified version, which included four specific levels: (1) remembering, (2) processing, (3) creating and (4) evaluating. The results indicated that the most common cognitive level utilized by both teachers and students were the 'processing' level and the 'remembering' level was utilized least frequently of both of them. Results showed little difference existed between the distributions of the cognitive level of in-class and on-line instruction; however, the results did show that out-of-class assignments attained a higher cognitive level than in-class discourse and on-line course content. The 'creating' level was the most common cognitive level utilized in out-of-class assignments. A training program is recommended for teachers who will teach a web-enhanced or web-based course. The program should contain: (1) the familiarity with the technology, (2) on-line class management skills and (3) pedagogical training, such as: higher cognitive level of teaching and the objective classification system.

Kim, S., Kolko, B. E., & Greer, T. H. (2002). Web-based problem solving learning: third-year medical students participation in end-of-life care virtual clinic. *Computers in Human Behavior*, *18*, 761-772.

This exploratory study examined problem-solving in an on-line problem-based learning environment. Participants included two faculty moderators and 30 medical students in the end-of-life care Virtual Clinic. Using content analysis of transcripts, the authors analyzed interaction patterns in two groups of students and moderators and students' problem-solving skills as measured by the critical thinking ratio. Moderator in Group 1 posted more connected comments, feedback, and questions than the moderator in Group 2. Students in Group 1 posted more connected comments compared to students in Group 2. However, the disparate interaction patterns yielded little differences in students' critical thinking skills in both groups. The authors propose the use of critical thinking ratio as an effective outcome measure in assessing problem-solving skills.

Lederer, N. (2000). Using the web to teach research and critical thinking skills. *Reference Services Review*, *28*, 130-153.

At Colorado State University, the library liaison works with the director of the first-year composition program to design Web pages for courses. Discusses the rationale behind the use of Web pages to teach library research skills, and provides illustrated examples. Includes the frequency of use of the pages and teacher feedback. Analysis of "hits to pages" provides insight regarding how the Web pages are used.

November, A. (2001). *Empowering students with technology*. Arlington Heights: Skylight Professional Development.

This book explores the opportunities that technology provides to empower students to learn how to learn. Chapter 1 "Teaching and Learning the Structure of Information" covers information literacy, MAPping (Met-Web Information, Author, Purpose) the *Internet*, confusing technical mastery with *critical thinking*, and blocking versus access. Chapter 2, "Empowering Learning by Expanding Relationships," discusses planning for learning (instead of technology), the underused fax machine, video conferencing, e-mail in a cultural context, teacher-created World Wide Web sites, and publishing student work on the Web. Chapter 3, "Emerging Roles within the Knowledge Community," addresses teachers as digital immigrants, available help and support, benchmarking educational practice, shifting control, raising expectations of students as knowledge producers, and managing fear. Chapter 4, "Accessing Primary Sources To Enhance *Critical Thinking*," addresses using and assessing primary sources. Chapter 5, "Building Knowledge without Boundaries," explores online learning, pioneers on the digital frontier, changing roles and interactions, students and teachers involved in online learning, individual courses supporting learning, and building on exceptional programs. E-VENTURES, i.e., educational adventures that teachers can apply or modify to suit various needs and subject areas are included throughout, and each chapter has a page for the reader to reflect on his/her teaching practices or attitudes. The appendix lists related Web sites for each chapter. (Contains 35 references and an index.)

Orrill, C. H. (2000). *Designing a PBL experience for online delivery in a six-week course*. Annual Meeting of the American Educational Research Association. New Orleans, Louisiana.

This paper describes and evaluates the design process involved in creating a single problem for online delivery in a *problem-based learning* (PBL) situation. The paper attempts to highlight the issues involved with implementing the problem in a completely distributed environment through a narrative about the design of the problem within an instructional design model. The problem was developed for a graduate-level course titled "Integrating the *Internet* across the Curriculum." The Theoretical Model for the Design of Open-Ended Learning Environments (OELE) (J. Hill and S. Land, 1998) was used, and following this model, the first steps were analyses of the environment and the participants. Goals were defined, with the PBL approach chosen to provide students with a rich opportunity to explore elements of technology integration. The selection of delivery media was easier because of the researchers' access to an asynchronous conferencing tool that had been developed to support PBL in a distributed environment. The one area of OELE that was different for this delivery was the inclusion of all course supporting material on the Web site. The design phase concluded with the development of an evaluation plan and a plan for maintenance of the online PBL experience. (Contains 23 references.)

Pray, J. L. (2001). Enhancing critical thinking and professionalism through the use of the discussion forum in social work practice courses. *Journal of Technology in Human Services*, *18*, 65-75.

: Discusses the incorporation of technology into graduate and undergraduate social work curricula at Gallaudet University. In a 3-yr project, forums were conducted to promote students' ability to use theory, analyze controversial issues, analyze and address ethical issues, professionally critique the work of peers, and conceptualize practice problems and discussion issues. Ss subsequently completed evaluations concerning the forums' ability to enhance depth of thinking about practice issues and to foster a sense of collegiality among students. Results show that Ss perceived that the discussion forums enhanced their learning and development as professionals. Undergraduates rated the forum highly, and some commented that their on-line discussions made them feel more professional than when they were discussing similar issues in class.

Reznich, C. B. & Werner, E. (2001). *Integrating technology into PBL small groups in a medical education setting*. Annual Meeting of the American Educational Research Association. Seattle, Washington.

How students used computers and *Internet* access in the day-to-day work of the *problem-based learning* (PBL) classroom was studied with second year medical students working in small learning groups. Fifteen students, one from each PBL group, met as a focus group to discuss computer and *Internet* use. Several themes emerged from the discussions. Overall, there was a generally positive effect of the use of network technology on the PBL discussion process. The role of the preceptor appeared crucial for the group sessions and for the use of electronic resources. The technology was used for several different reasons, especially "foraging" for information or targeted hunting for specific information. The use of the technology appeared to influence students' experience of medical education in terms of electronic cooperation.

Rice, M. L., Wilson, E. K. & Bagley, W. (2001). Transforming learning with technology: lessons from the field. *Journal of Technology and Teacher Education*, *9*, 211-230.

Professional organizations in many subject areas have emphasized changing the way subject matter is taught by actively involving students in critical thinking , problem-solving, decision-making, and exploration. One way to accomplish this is with the use of technology and constructivism, although many barriers to technology integration exist. This article follows a classroom teacher through five years of working to integrate technology, and in turn, constructivism into his classroom. This teacher was successful in helping his students gain new skills or enhance existing skills in technology, critical thinking , collaboration, presentation, and self-learning. The teacher's changes in instructional practices, his reflections on these changes, how he overcame common barriers to integrate the technology, and the benefits to himself and his students are discussed.

Yumuk, A. (2002). Letting go of control to learners: the role of the internet in promoting a more autonomous view of learning in an academic translation course. *Educational Research*, *44*, 141-156.

Investigates how an Internet information search based program in an academic course can encourage learners who have a traditional view of learning to take more responsibility for their own learning. The study took place with 90 third-year English-speaking translation students whose native language is Turkish. The study aimed to design and evaluate a program to promote a change in students' attitudes from a traditional, recitation-based view of learning to a more autonomous view of learning. The program was implemented to encourage students to use the Internet in order to select, analyze, evaluate and apply relevant information to enhance the accuracy of their translations. The evaluation of the program was carried out with reference to pre- and post-course questionnaires, post-course interviews and information recorded weekly in a diary by the teacher as researcher. The results indicate that the program had a significant impact on students, in that it promoted a change in the view of learning towards more autonomy. After applying Internet-based information searches to their written translation tasks, the majority of the students accepted that the translation process required more personal responsibility from the learner, and furthermore, they viewed learning more meaningfully.