Annotated Bibliography: Assessment of Critical Thinking in Higher Education

Benjamin, R. (2014). Two questions about critical-thinking tests in higher education. *Change: The Magazine of Higher Learning*, *46*(2), 24–31. https://doi.org/10.1080/00091383.2014.897179

An overview of the Collegiate Learning Assessment (CLA), a standardized test that measures critical thinking. Written by the president of the organization that oversees the CLA, the discussion of testing versus portfolios as critical assessment tools may be useful even if the objectivity of the analysis can be doubted.

Brown, N. J. S., Afflerbach, P. P., & Croninger, R. G. (2014). Assessment of critical-analytic thinking. *Educational Psychology Review*, *26*(4), 543–560. https://doi.org/10.1007/s10648-014-9280-4

Looks at a subset of critical thinking called critical-analytic thinking, defined as the ability to evaluate information across multiple modes and content areas.

Cheung, C., Rudowicz, E., Kwan, A. S. F., & Yue, X. D. (2002). Assessing university students' general and specific critical thinking. *College Student Journal*, *36*(4), 504–526.

Report of an attempt to assess eight critical thinking skills of 577 City University of Hong Kong students using a brief questionnaire using true/false, multiple choice, and Likert scale queries. Results of the assessment suggest that critical thinking is not merely a cognitive phenomenon and that any attempt to measure critical thinking must address four dimensions: cognitive, motivational, ideological, and behavioral.

Franco, A. R., Costa, P. S., Butler, H. A., & Almeida, L. S. (2017). Assessment of undergraduates' real-world outcomes of critical thinking in everyday situations. *Psychological Reports*, *120*(4), 707–720. https://doi.org/10.1177/0033294117701906

Portuguese study examining the use of a variant of Real-World Outcomes, a yes/no based inventory designed to measure the application of critical think skills in students' every day decision-making in various arena of life: academic, interpersonal, health, political, legal, or financial. This article seems to operate under a different model of critical thinking than most of the others in this bibliography, but the Real-World Outcomes questionnaire may still be useful in a classroom oriented towards critical thinking.

Hathcoat, J. D., Penn, J. D., Barnes, L. L. B., & Comer, J. C. (2016). A second dystopia in education: Validity issues in authentic assessment practices. *Research in Higher Education*, *57*(7), 892–912. https://doi.org/10.1007/s11162-016-9407-1

Examines a problem with critical thinking assessment: the impact of written communication skills on assessment scores (i.e. a well-written response can be mistaken for a well-thought response). Appendix includes separate rubrics for critical thinking and writing skills.

Haynes, A., Lisic, E., Goltz, M., Stein, B., & Harris, K. (2016). Moving beyond assessment to improving students' critical thinking skills: A model for implementing change. *Journal of the Scholarship of Teaching and Learning*, *16*(4), 44–61. https://doi.org/10.14434/josotl.v16i4.19407

Case study reporting the success of using the Critical Thinking Assessment Test (CAT) (see Stein, below) in conjunction with CAT-Apps (CAT Applications within the discipline) training for faculty members. The result is better alignment of critical thinking assessment with teaching practices, as well as an increased sense of group identity among faculty attempting to teach critical thinking skills in their classrooms.

Hohmann, J. W., & Grillo, M. C. (2014). Using critical thinking rubrics to increase academic performance. *Journal of College Reading and Learning*, *45*(1), 35–51. https://doi.org/10.1080/10790195.2014.949551

Provides a summary of the Paul-Elder Critical Thinking Model, which focuses on the role of metacognition in problem-solving. Useful charts (Figures 1-3) and sample rubric.

Liu, O. L., Frankel, L., & Roohr, K. C. (2014). Assessing critical thinking in higher education: Current state and directions for next-generation assessment: Assessing critical thinking in higher education. *ETS Research Report Series*, *2014*(1), 1–23. https://doi.org/10.1002/ets2.12009

Provides a comprehensive overview of the varying definitions of critical thinking, available assessments, and challenges in assessing critical thinking. The second half of the report proposes an operational definition of critical thinking consisting of five dimensions: two *analytical* dimensions (evaluating evidence, analyzing arguments); two *synthetic* dimensions (understanding implications, produce new arguments) as well as understanding causation. Possible assessment methods utilizing this definition are discussed.

Morreale, C., Van Zile-Tamsen, C., Emerson, C. A., & Herzog, M. (2017). Thinking skills by design: Using a capstone eportfolio to promote reflection, critical thinking, and curriculum integration. *International Journal of EPortfolio*, *7*(1), 13–28.

Description of a pilot program for a general education capstone course. The ePortfolio consisted of prior coursework, a reflective essay connecting general education learning with disciplinary courses, and a summary of the overall impact of general education on their learning.

Peach, B. E., Mukherjee, A., & Hornyak, M. (2007). Assessing critical thinking: A college's journey and lessons learned. *Journal of Education for Business*, *82*(6), 313–320. https://doi.org/10.3200/JOEB.82.6.313-320

An overview of the efforts to assess critical thinking at the University of West Florida College of Business, including brief descriptions of 11 lessons learned in the process.

Pretorius, L., van Mourik, G. P., & Barratt, C. (2017). Student choice and higher-order thinking: Using a novel flexible assessment regime combined with critical thinking activities to encourage the development of higher order thinking. *International Journal of Teaching and Learning in Higher Education*, *29*(2), 389–401.

Describes an assessment regime in which "compulsory, product-focused" (i.e. summative) assessments were combined with "voluntary, processed-focused" formative assessments. Positive results were shown with the processed-focused assessments, which were designed to require student critical thinking. The study authors conclude that these sorts of assessments can produce even better results when more directly tied to disciplinary issues.

Shaarawy, H. Y. (2014). The effect of journal writing on students' cognitive critical thinking skills a quasi-experiment research on an EFL undergraduate classroom in Egypt. *International Journal of Higher Education*, *3*(4), 120–128. https://doi.org/10.5430/ijhe.v3n4p120

Small study using pre- and post-testing to measure critical thinking skills. Classroom that also used journaling with metacognitive writing prompts scored higher on post-test than classroom without journaling prompts.

Shim, W., & Walczak, K. (2012). The impact of faculty teaching practices on the development of students' critical thinking skills. *International Journal of Teaching and Learning in Higher Education*, *24*(1), 16–30.

Examines differences between students' self-reported and directly measured critical thinking abilities, the latter using the Collegiate Assessment of Academic Proficiency (CAAP). The authors of the study conclude that a wide variety of learning activities can support critical thinking, but assignments that ask challenging questions, require application of abstract concepts, and require comparison and contrast are most likely to produce results.

Stein, B., & Haynes, A. (2011). Engaging faculty in the assessment and improvement of students' critical thinking using the critical thinking assessment test. *Change: The Magazine of Higher Learning*, *43*(2), 44–49. https://doi.org/10.1080/00091383.2011.550254

Overview of the Critical Thinking Assessment Test (CAT), including comparison to the CLA (see Benjamin, above). One key difference is that the CAT is designed to be scored by faculty following training. This allows for more direct knowledge of student strengths and weaknesses.

Terry, D. R. (2012). Assessing critical-thinking skills using articles from the popular press. *Journal of College Science Teaching*, *42*(1), 66–70.

Describes a learning activity involving the investigation of claims made in popular press science articles. The sample rubric provided seems underdeveloped, but perhaps the activity could be combined with the rubrics of Hathcoat or Hohmann, above.

White, B., Stains, M., Escriu-Sune, M., Medaglia, E., Rostamnjad, L., Chinn, C., & Sevian, H. (2011). A novel instrument for assessing students' critical thinking abilities. *Journal of College Science Teaching*, *40*(5), 102–107.

Examines the Assessment of Critical Thinking Ability (ACTA) survey, in which science students examine multiple research reports on the same phenomena, measuring the handling of conflicting data, the ability to identify and resolve of flaws in studies, and capacity for conceptualizing alternate interpretations. Suggests similar surveys could be easily constructed for other disciplines.