Critical Thinking Assessment Project 2008-09 Summary
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During the Summer Institute 2008, a small group of faculty members were given stipends to refine the Critical Thinking Assessment Instrument (CTAI). During these faculty meetings, it came to light that one third of the items on the CTAI could be used to measure science literacy. The group decided to ask Eva Bagg’s research assistant, Hannah Alford, to analyze 10 of the 30 items on the CT assessment instrument separately, as a measure of science literacy. In addition, there were nine items that could be used as a measure of Numeric Literacy. Hannah was also asked to analyze these items as a separate subscale. Finally, some of the items were replaced or rewritten in preparation for a campus-wide assessment effort in Fall 2008.

The Fall 2008 semester’s critical thinking assessment (which assessed 731 students) yielded interesting results. Forty-five minutes was sufficient time for almost all students to complete the 30-item instrument, with the majority of students finishing within a 30-minute time frame. The instrument did distinguish between freshmen and sophomores on critical thinking, but only seven of the items were needed to make this discrimination. Freshmen and sophomores were significantly different on the Science Literacy items, but not on the Numeric Literacy scale. When an item fails to discriminate between freshmen and sophomores, it could be a “bad” item, or, another possibility is that students aren’t learning the skill reflected by the items.

Paul Creason was asked to share these results with the math department and discuss the Numeric Literacy items with the math faculty. Did the math faculty want to recommend other assessment items to try on the CTAI? Would they be willing to define for the ASLO committee what numeric skills constitute Numeric Literacy? During the spring 2009 semester, the ASLO committee members had agreed amongst themselves that consumer math questions would be good ones for inclusion, but at the October 30, 2008 Flex Day meeting with Tricia Alexander, the math department members said they did not think such items represented the essence of Numeric Literacy.

During the Fall 2008 semester, Research Methods (Psych 2) students were given the revised CTAI, along with a new Scientific Mindedness Inventory (SMI), and a published critical thinking assessment instrument, the Watson-Glaser Critical Thinking Appraisal. The students’ scores on the CTAI and the Watson-Glaser were moderately correlated, suggesting the validity of the CTAI. Whereas the CTAI was designed to measure critical thinking skills, the new SMI was designed to measure a disposition toward thinking like a scientist (which is essentially the same disposition as that of a critical thinker). The students’ scores on the CTAI and the SMI were only modestly correlated, suggesting that having good thinking skills is a distinct quality from having the inclination to engage issues that challenge a person to think.

The next step with the critical thinking assessment was to compare students’ results with those of faculty, and with those of more advanced students, such as those at CSULB. The CTAI was given to a sample of CSULB students during the Fall 2008 semester, and the results were similar to those of LBCC students. Interestingly, the CSULB students did not score as quite well on the critical thinking problems as did the LBCC students. A small sample of faculty members’ scores
N=15 were compared with the students’ scores. Not surprisingly, faculty members performed consistently better on the CTAI.

During the Spring 2009 semester, three psychology and two philosophy classes were given the CTAI. These data are being analyzed during the Summer 2009. During the Summer 2009, one psychology class (N = 34) was given the CTAI. In addition, the CTAI is again being scrutinized, which may result in recommendations for further revisions and/or suggestions for further validation efforts. Also, the CTAI items have not been analyzed by critical thinking skill, which would yield information as to students’ relative strengths and weaknesses on the seven skills measured by the CTAI. The skills can be categorized as follows:

- Analyzing Arguments
- Inductive Reasoning
- Deductive Reasoning
- Recognizing Fallacies
- Recognizing Assumptions
- Distinguishing Fact from Opinion
- Problem-Solving

During the analysis this summer, it came to light that some of the CTAI items that distinguished between freshman and sophomore students in the Fall 2007 pilot study may have been deleted from the edition of the instrument that was used for the Fall 2008 assessment.

In the future, faculty members will be given leeway as to how they want to measure critical thinking skills. Faculty members’ choices of assessment tool if they want to assess Critical Thinking, Science Literacy, or Numeric Literacy, are as follows: (a) They may use the existing CTAI that has been developed by the ASLO committee; (b) Since faculty teaching courses for which they have given a “4” or “5” rating on critical thinking have, by assigning this rating, indicated that they are already assessing critical thinking, they should be able to pull assessment data for the college out of the embedded products required from the students taking the courses; or (c) If faculty members want help designing a new assessment tool, the ASLO committee can be a resource to them in doing this. Also, the English department has developed a department-wide model for assessing critical thinking, and this could also serve as a model for other departments.