

2019-2020 Institutional Assessment of Critical Thinking: Summary Report

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ILO: *Westmont graduates will accurately evaluate the strength of evidence in support of a claim.*

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INSTRUMENT: The Critical Thinking Assessment Test (the CAT)

CRITICAL THINKING SKILLS BY CAT QUESTION:

- Q1 – Summarize the pattern of results in a graph without making inappropriate inferences.
- Q2 – Evaluate how strongly correlational-type data supports a hypothesis.
- Q3 – Provide alternative explanations for a pattern of results that has many possible causes.
- Q4 – Identify additional information needed to evaluate a hypothesis.
- Q5 – Evaluate whether spurious information strongly supports a hypothesis.
- Q6 – Provide alternative explanations for spurious associations.
- Q7 – Identify additional information needed to evaluate a hypothesis.
- Q8 – Determine whether an invited inference is supported by specific information.
- Q9 – Provide relevant alternative interpretations for a specific set of results.
- Q10 – Separate relevant from irrelevant information when solving a real-world problem.
- Q11 – Use and apply relevant information to evaluate a problem.
- Q12 – Use basic mathematical skills to help solve a real-world problem.
- Q13 – Identify suitable solutions for a real-world problem using relevant information.
- Q14 – Identify and explain the best solution for a real-world problem using relevant information.
- Q15 – Explain how changes in a real-world problem situation might affect the solution.

DATA COLLECTION: We gave the CAT to 141 students in eight senior seminar classes in spring 2020 before COVID. Due to COVID restrictions, the tests were scored by a machine-learning process rather than by our faculty and staff. Based on analysis of GPA, SAT, and ACT data, the graduating seniors who took the CAT are representative of the entire class of 2020.

RESULTS: The 2020 average total score is 17.48 out of a possible 38. This score is lower than the 2014 average of 20.37. Moreover, our 2020 average score is only 80% of the average national CAT score (21.79) achieved by students with the same average SAT or ACT score.

As for sub-groups, the NBS students did the best overall (17.88) followed by the SS students (16.98) and the HUM students (16.81). Of the 12 majors represented, mathematics (22), philosophy (21.8), and sociology (20) are the top three and economics & business (16.9), religious studies (16.5), and English (16) are the bottom three. The average scores of men (17.5) and women (17.41) are nearly the same. And whites (18) did better than students of color (16.7). The most interesting sub-group results are that transfers (19.8) did better than non-transfers (17.1) and first-gens (18.4) did better than the overall average (17.48).

The most important 2020 result for assessment purposes going forward is that our students did significantly worse than the national average on four questions (4, 7, 9, & 15). These questions all involve problem solving, creative thinking, and effective communication (in the case of 4, 7, & 15) and creative thinking and effective communication (in the case of 9). None of

them involve the general skills of evaluating and interpreting information (which eight of the other questions required). Two of these (4 & 7) involve the same specific skill (“additional information needed to evaluate a hypothesis”), one involves the specific skill of “providing relevant alternative interpretations for a specific set of results” (9), and the fourth (15) the specific skill of explaining how changes in a real-world problem situation might affect the solution of a problem. Our students did worst on 7 relative to the national average and roughly the same on the others.

What each of these three skills seem to have in common is *a creative use of the intellect and/or imagination* to think of evaluations, interpretations, or solutions that go beyond what is explicitly (and perhaps even implicitly) given in the test. The skill involved in answering questions 4 and 7 well requires *additional* information, the skill involved in answering question 9 well requires relevant *alternative* interpretations, and the skill involved in answering question 15 well requires explaining how *changes* in a real-world problem situation might affect a solution.

RECOMMENDATIONS: The Critical Thinking Assessment Team recommends the Westmont faculty discuss possible pedagogical and curricular changes that will facilitate our students’ improvement in the three skill areas involved in the four CAT questions on which our students did significantly worse than the national average:

- Identify additional information needed to evaluate a hypothesis. (Q4 & Q7)
- Provide relevant alternative interpretations for a specific set of results. (Q9)
- Explain how changes in a real-world problem situation might affect the solution. (Q15)

The Critical Thinking Assessment Team recommends that the Academic Senate:

- (1) Identify courses in which focused instruction could be given for the improvement of the three skills listed above (the Team recommends at least one GE course from each of the three divisions such as PHI-012, CHM-005, and SOC-001—but ideally more);
- (2) Secure faculty members willing to teach those skills in those courses;
- (3) Provide those faculty members with the financial and pedagogical resources they need to implement this skill instruction effectively;
- (4) Arrange to use CATs for pre-tests and post-tests in these courses;
- (5) Set as a benchmark the average overall national CAT score of SAT-peers at comparable institutions; and
- (6) Consider changing the ILO to include a broader range of critical thinking skills.

Also, in response to a CUPA Team suggestion, the CT Team also recommends the Senate

- (7) Change the language of the Critical Thinking ILO. The new ILO reads, “*Westmont graduates will demonstrate sound judgment and creative thinking when evaluating the strength of evidence in support of a claim.*”

Another recommendation for individual departments is to (1) select the skills tested by the CAT that are especially important in their discipline and then (2) develop discipline-specific analogs to the CAT questions that test students on these skills (“CAT Applications” or “CAT Apps”). Though students’ responses to these discipline-specific analogue questions will not be assessable by the standard CAT scoring process, departments can formulate their own rubrics as tools to evaluate the tests they construct out of their discipline-specific questions. We recommend offering a workshop for the faculty who volunteer to incorporate CAT-related assignments in their courses (and for other interested faculty as well).

See the full report and the separate appendices for more information and documentation.