Report on Critical Thinking/Information Literacy Assessment

spring 2015
submitted August 2015

The Core Competencies Team (CCT) was formed in order to meet the WASC requirement that universities assess the core competencies (Written Communication, Oral Communication, Critical Thinking, Quantitative Reasoning, Information Literacy) of senior students at the institutional level. The CCT members are Sharon Hamill, Yvonne Meulemans, Joanne Pedersen, Catherine Cucinella, Terri Metzger, Jessica Elbert Decker (Mayock), David Barsky, and Melissa Simnitt.

The assessments are discipline-neutral and focus on University-level student learning outcomes rather than program or college-level interests. The critical thinking and information literacy rubric was crafted to assess students’ ability to use information ethically, identify issues, analyze information and arguments, and come to conclusions using inductive and deductive strategies. The assessment was designed to measure these skills across the curriculum, with samples from both general education courses and senior-level majors courses.

It is important to note that assessment efforts, like this one, are not considered research on the process of learning, rather they are intended to measure to what degree a learning outcome is met. Methodologies, sampling approaches, and data analysis are determined in the context of campus culture and available resources for assessment.

The assessment of Critical Thinking/Information Literacy took place during the Spring 2015 semester. Six faculty members from six different courses, using existing course assignments, scored a total of 109 assignments (99 written, 10 oral). Of the six course, one course was an upper-division general education course. (n = 28). The remaining five courses were all upper-division courses within a major. Only work from seniors was scored.

# **Assessment project**

Instrument: During Fall 2014, the CCT members discussed how to approach assessing information literacy and critical thinking. The group concluded that sufficient conceptual overlap occurred in the concepts of critical thinking and information literacy that would facilitate assessing both simultaneously. Jessica Elbert Decker (Philosophy) and Yvonne Nalani Meulemans (Library Faculty) took the lead on reviewing existing rubrics of these two concepts to determine if a single rubric could be created and used that combined the central tenets of critical thinking and information literacy. The VALUE Rubrics for Information Literacy and Critical Thinking, as well as rubrics from other universities were consulted. An initial draft was created and then edited by the library faculty from the Library’s Information Literacy Program, a group of Philosophy faculty, and members of the CCT. After several iterations, a final draft of the rubric (Appendix A) was created.

The rubric was also considered alongside the CSUSM’s Undergraduate Learning Outcome (ULO) 2:

*Students graduating with a Bachelor’s degree from CSU San Marcos will be creative, empathetic, and engaged life-long learners who are:*

**2)  Comprehensive and critical thinkers. Students will be able to:**

1. Identify key concepts and develop a foundation for future inquiry
2. Analyze complex problems and develop solutions by applying quantitative and qualitative reasoning, integrating knowledge and skills from a variety of disciplines
3. Construct well-reasoned arguments based on evidence

In addition, the Philosophy faculty that reviewed and edited the rubric made changes to ensure that the rubric reflects the specific GE learning outcomes for Area A3 (Critical Thinking):

 A3.1: Distinguish matters of fact from issues of judgment or opinion and derive factual or judgmental inferences from unambiguous statements of knowledge or belief.

 A3.2: Judge the reliability and credibility of sources.

 A3.3: Effectively argue a point of view by clarifying the issues, focusing on the pertinent issues, and staying relevant to the topic.

 A3.4: Understand the nature of inductive and deductive reasoning, identify formal and informal fallacies of reasoning, and employ various methods for testing the strength, soundness, and validity of different argument forms.

 A3.5: Understand the basic concepts of meaning (sense, reference, connotation, etc.) and identify different methods of word definition.

A3.6: Understand logic and its relationship to language by identifying the basic components of reasoning, including the propositional content of statements, the functions of premises and conclusions in the makeup of arguments, the linkage between evidence and inference, and the rules of inference and logical equivalence.

The final rubric consists of four criteria: Explanation of Issues (Identify/Evaluate), Reasoning/Planning (Analyze), Outcome (Synthesize), and Ethical Use of Information.

The conceptual overlap between critical thinking and information literacy can be easy to see and difficult to describe. That is, in both critical thinking and information literacy, one must be able to “explain the issues”, yet it will manifest in very different ways. A student might demonstrate an explanation of issues via an opening paragraph of an argumentative essay if being assessed solely on critical thinking. When assessing solely on information literacy, a student might demonstrate an “explanation of issues” by using appropriate terminology (colloquial versus formal) and connect the terminology in a way that might be of use when searching for information.

A dimension of the rubric created for this assessment effort that clearly comes from information literacy is the “ethical use of information.” While it could be argued that critical thinkers are expected to use to information ethically, there is much in the research about information literacy that illustrates that understanding how to access and use information ethically is fundamental. Frequently, this dimension is demonstrated in a student’s correct use of citation styles appropriate to a discipline.

There is much research that explores how critical thinking and information literacy both intersect and deviate from each other. This body of research could be informative for future attempts to assess student learning in these areas. The CCT recognizes there are weaknesses to combining the two concepts for an assessment at this level. For example, critical thinking and information literacy in the arts will be demonstrated in very different ways than in the sciences. These two concepts can also be seen as symbiotic: How can a person be information literate and not demonstrate characteristics of critical thinking? When a person engages in critical thinking, are they not demonstrating characteristics needed to be information literate? The group urges the university to revisit these questions when these concepts are assessed again.

Faculty Participants: During the spring 2015 semester, a random sample of General Education and senior-level majors courses was obtained. The University Assessment Council (UAC) was given a list of courses that were identified from this randomly generated list and asked to recruit faculty participants who taught these courses for the project. Nine faculty members, from all Colleges, were initially approached. Some faculty declined to participate. When a faculty member declined to participate, CCT asked the UAC to identify other faculty within a college that might do so, even if the course they taught was not on the randomly generated list. While this prevented a truly random, representational sample of courses, CCT chose to prioritize obtaining student work from each college.

Identifying participants was challenging though the reason for this difficulty is unclear. It could have been due to the timing of the assessment or a general reluctance to conduct assessment. It is important that as the campus moves forward on making assessment more systematic, we gain a better understanding of why faculty opt out of such assessments. The CCT and the UAC did, however, meet the goal of having at least one faculty member from each college submit data.

Process: Prior to the assessment, Core Competency Team members met, either face to face or by phone, with faculty participants to provide an overview of the project, the rubric, and the procedures. Participants used the rubric to assess the four criteria as described in the rubric. Six faculty in total participated, with at least one faculty member from each of the four colleges.

Faculty participants had the choice to use either paper or electronic format of the rubric to record student scores. The electronic rubric was maintained on SurveyGizmo by the Office of Institutional Planning and Analysis. All participants used the electronic rubric. Data were downloaded for analysis.

# **The results**

**Students who meet threshold as seniors**

Of the 4 criteria, students were strongest in terms of ethical use of information and explanation of issues; they were weakest in analyzing and synthesizing information. This was true for the overall sample as well as each sub-group (GE versus Majors courses).

The percentage of students who were effective (scored 3 or higher) on all 4 criteria: 68/109 = 62.4%. A second analysis was run with the criterion “ethical use of information” omitted because student performance on this criterion was not scored in one course. The percentage of students who were effective (scored 3 or higher) on 3 criteria was 71/109 = 65.1%

When examining the data for all students in the assessment, results show that although 72.5% to 94.2% of graduates meet the minimum standard (“effective”) for CT/IL on *any one criterion*, less than 2/3 of our graduating seniors (62.4%) meet the minimum standard on *all four* criteria.

**GE versus Majors: Student Performance**

Results are presented separately for the GE (n = 28) and Senior major courses (n = 81). Results of t-tests indicated that on every criterion, students in the GE course scored significantly higher than students in majors courses. Caution should be used in interpreting this finding as there was only one GE course represented in the sample; thus, the findings could reflect either real differences, biases on the part of the professors, or different standards imposed for demonstrating CT/IL in GE and majors courses. Inspection of the standard deviations indicates that there was considerable variation on the reasoning/planning and outcomes criteria for the faculty evaluating student work in majors courses. This may suggest that the faculty need to discuss exactly what these outcomes may mean for majors versus GE courses.

Total sample: 109 assignments (rated on a 4-point scale)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criterion** | **GE Mean (SD)** | **Majors Mean (SD)** | **Overall Mean (SD)** | **% of total sample obtaining a 3 (meets standard) or higher on the criterion** |
| Explanation of Issues (identify/evaluate)\*+ | 3.86 (.36) | 3.21 (.79) | 3.38 (.76) | 85.2% |
| Reasoning/Planning (analyze)\*+ | 3.54 (.51) | 2.91 (1.02) | 3.07 (.95) | 77.0% |
| Outcome (synthesize)\* | 3.79 (.42) | 2.80 (1.1) | 3.06 (1.06) | 72.5% |
| Ethical Use of Information\*+ | 3.93 (.26) | 3.54 (.65) | 3.67 (.58) | 94.2% |

\*Statistically significant difference

+N = 81 (the criterion was not relevant for the assignment in one course)

Total Sample: n =109 (valid percent – missing data not included)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Above Standard****(GE****Majors)** | **Meets Standard** | **Approaching Standard** | **Emerging** |
| Explanation of Issues (identify/evaluate) | **53.7** | **31.5** | **13.9** | **.9** |
| * GE
 | *85.7* | *14.3* |  |  |
| * Majors
 | *42.5* | *37.5* | *18.8* | *1.3* |
| Reasoning/Planning (analyze) | **39.4** | **37.6** | **13.8** | **9.2** |
| * GE
 | *46.4* | *53.6* |  |  |
| * Majors
 | *34.6* | *34.6* | *18.5* | *12.3* |
| Outcome (synthesize) | **45.9** | **26.6** | **14.7** | **12.8** |
| * GE
 | 78.6 | 21.4 |  |  |
| * Majors
 | 34.6 | 28.4 | 19.8 | 17.3 |
| Ethical Use of Information+ | **72.4** | **21.8** | **5.7** | **0** |
| * GE
 | 92.9 | 7.1 |  |  |
| * Majors
 | 62.7 | 28.8 | 8.5 |  |

+N = 81 (the criterion was not relevant for the assignment in one course)

# **Recommendations**

We offer the following recommendations to the University Assessment Council regarding the Report on Assessment of Critical Thinking/Information Literacy:

Disseminating the results of this assessment begins the process of taking action. We urge the UAC to disseminate the results widely to the following individuals and units across campus:

* Dean of Undergraduate Studies
* The Associate Deans of the Colleges (to share report at meeting with their Deans/and Department Chairs)
* Faculty Center Director
* Faculty Center Associate Director for Teaching and Learning
* Executive Committee of the Academic Senate for discussion
* Academic Senate as an information item
* Institutional Analysis and Research (this data can be linked to existing data on oral communication)
* Dean of the Library and Library faculty

Additional recommendations include:

* Faculty (TT and lecturer faculty) and administrators can discuss the assessment results. Possible discussion prompts include:
	+ How do you define “critical thinking” in your discipline? What evidence do you use to determine whether students exhibit CT?
	+ How do you define “information literacy” in your discipline? What evidence do you use to determine whether students exhibit IL?
	+ Does your curriculum support the development of CT and IL as students move through their undergraduate years?
	+ What kinds of opportunities do students have to analyze and synthesize information?

The lower scores in analysis and synthesis indicate that while students are skilled at identifying issues and collecting information, as well as using information ethically, they are less adept at synthesizing that information to come to conclusions. Since the skills of analysis and synthesis are relevant to all disciplines across the curriculum, departments might discuss how their assignments support learning and practicing these skills. It could be argued that analysis and synthesis are more sophisticated processes than identifying issues and evaluating sources, and students may not have had much experience in these skills prior to their college coursework.

If analysis/synthesis skills are indeed more complex, students may not have learned these skills before college—perhaps due to the emphasis on standardized testing. Undergaduate students have been trained to “get the right answer” and are very unsure of themselves when asked to construct an argument using evidence and logic. Maybe one way to use the assessment results is to look at the curriculum, especially assignments, within each discipline and identify methods and assignments that help to foster these more sophisticated levels of CT/IL. Even though the sample size is small, the GEC may want to consider the question of whether CT/IL “look different” in GE courses versus majors courses.

Beyond the results presented here, there may be value in faculty discussing in detail what abilities CSUSM graduates should have in critical thinking and information literacy. While the rubric was an effort of many faculty, these constructs are large, complex, and can be demonstrated in many different ways. Such determinations about what CSUSM students think, do, and know are essential in order to embark on useful assessment at an institutional level.

Lastly, the methodology employed for this assessment had a number of weaknesses, most notably in the lack of norming the rubric and collecting a truly representative sample of student work. CCT members struggled significantly to identify participants and reached out to faculty and Associate Deans multiple times. The group decided against norming, in part, because of the difficulty in identifying participants. While assessment is not research, it is still not ideal to have to prioritize having participants over ensuring a valid rubric with which to conduct the assessment. The question is again raised: Why was it so difficult to find participants? CCT believes it indicates a need for a more systematic approach to core competencies assessment in general. If more faculty and administrators understood the ultimate purpose of assessment-to improve student learning-there may be greater participation not only of the actual assessment, but in designing a sustainable, meaningful approach to this essential aspect of faculty work.

**Appendix A: Critical Thinking/Information Literacy rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 1Emerging | 2Approaching Standard  | 3Meets Standard | 4Above Standard |
| Explanation of Issues(Identify/Evaluate) | Limited ability to distinguish fact from opinion; limited understanding of credible/relevant sources/ideas; fails to recognize multiple perspectives | Recognizes fact and opinion as categories; awareness of standards of credibility in sources/ideas; awareness of multiple perspectives | Distinguishes between fact and opinion; evaluates sources/ideas as credible or relevant; recognizes multiple perspectives | Clear method of distinguishing between fact vs opinion and credible/relevant; sophisticated understanding of multiple perspectives  |
| Reasoning/Planning (Analyze) | Articulates possible arguments, plans, or solutions with little or no logical approach | Articulates possible arguments, plans, or solutions with imprecise reasoning | Articulates logical arguments, plans, or solutions using inductive and/or deductive reasoning skills and clear method(s) | Articulates sophisticated arguments, plans, or solutions using inductive and/or deductive reasoning skills and clear method(s) |
| Outcome(Synthesize) | Provides conclusions/finished ideas that are not tied to evidence; limited range of evidence/sources; demonstrates fallacious reasoning | Provides conclusions/finished ideas that are loosely tied to evidence from sources of varying credibility; demonstrates some fallacious reasoning | Provides logical conclusions/finished ideas informed by a full range of evidence from multiple and suitable sources; avoids fallacious reasoning | Provides logical conclusions/finished ideas informed by a full range of evidence from multiple and suitable sources; reasoning reflects complexity and avoids fallacies  |
| Ethical Use of Information | Provides minimal attribution of information sources  | Provides attribution of some information sources in some instances  | Appropriately attributes information sources, but with some inconsistencies | Provides appropriate attribution of information  |